Life Course Events and Internal Migration: Racial Differences in the Spatial Attributes of Life Course Migrations During the Transition to Adulthood*

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Abstract

A long line of research has found associations between neighborhood characteristics and individual well-being, particularly during childhood and adolescence. While individuals have limited ability in selecting the types of neighborhoods they live in during adolescence, this ability increases during the transition to adulthood, a demographicaly dense period in the life course marked by the occurrence of key life course events. Recent research has found that the age structure of life course events closely mirrors internal migration age profiles. However, there has been no investigation of the types of neighborhoods that individuals experiencing a life course migration move into and how the characteristics of destination neighborhoods differ by race. Understanding the factors that lead to moves into better or worse neighborhoods is important given racial inequalities in neighborhood attainment, growing concern over the increasing geographic concentration of poverty, and the strong continuity in neighborhood environments from childhood to adulthood and one generation to the next. Using data from the National Longitudinal Study of Adolescent Health, this article examines neighborhood racial and socioeconomic change arising with the co-occurrence of migration and four key life course events - starting a new job, marriage, childbearing, and entrance into college - that mark the transition to adulthood.

1 Introduction

Over the past several decades, there has been an explosion of empirical research on understanding the ways in which neighborhood characteristics contribute to the well-being of individuals. Studies have found associations between a variety of neighborhood

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characteristics, such as crime rates, concentrated disadvantage, and residential stability, and outcomes as diverse as mental health, high school graduation, and child abuse (Durlauf 2004; Ellen and Turner 2003; Sastry 2012; Sharkey 2014). Scholars have paid particular attention to the effects of neighborhoods during childhood and adolescence since it is during these stages in the life course that individuals may be most susceptible to social and environmental factors (Duncan et al. 2007; Huston and Ripke 2006).

A general finding in the neighborhood effects literature is that poor outcomes and negative behaviors appear to be more common in socioeconomically distressed areas; thus, individuals likely improve their life chances by moving out of these neighborhoods and into better environments (Jencks and Mayer 1990). However, children and adolescents have little control over the neighborhoods they live in. It is not until after adolescence, a period known as the transition into adulthood (Elder 1998), that individuals gain more freedom in selecting their residential locations. Several studies have examined the locational attainment of individuals during this important period. For example, Garasky (2002) finds differences in out-of-county and state migration patterns between urban and rural youths leaving their parental homes for the first time. Recent studies have evaluated the characteristics of neighborhoods that individuals move into after adolescence based on personal and family characteristics (Garasky 2002; Sharkey 2012; Swisher et al. 2013). These studies find that race and family socioeconomic status are strongly associated with neighborhood socioeconomic disadvantage and racial composition well into young adulthood.

While valuable, these studies fail to consider how life course transitions during the transition into adulthood shape locational attainment. This is an important consideration since the transition into adulthood is a demographically dense period in which important life course events, such as marriage, attending college, and entrance into the labor force, typically occur. Changes in individual and family demographic characteristics, such as health (Williams and Umberson 2004), criminal behavior (Laub and Sampson 1993), and income (Bozick and Deluca 2005), often accompany life course transitions. Most germane to locational attainment, researchers have also found that the age structure of life course events closely mirrors internal migration age profiles (Bernard et al. 2014, Hernandez et al. 2011, Lee et al. 1994; Rossi 1980). In other words, individuals experiencing a life course event often also migrate.

Few studies have explicitly linked changes in the neighborhood characteristics of movers to life course events or the underlying individual reasons potentially motivating residential mobility. Moreover, no studies to the author's knowledge have examined changes linked to life course events disaggregated by race. Doing so is important because moving due to one type of life course event compared to another may lead to vastly different neighborhood destinations. For example, previous studies have found that individuals are more likely to move out of state for college based on a set of variables, such as in-state tuition, climate, financial aid, and participation in NCAA athletics, that non-college attending individuals likely do not factor into their migration decisions (Baryla and Dotterweich 2001; Mixon 1992a; Mixon and Hsing 1994a, 1994b). Given that previous research has found a strong persistence in neighborhood disadvantage from child to adulthood, life-course transitions that accompany migration

into better neighborhoods may be key signals of upward social mobility or "turning points" that provide individuals with the opportunity to alter their life course trajectories (Elder 1998; Laub and Sampson 2003).

In this study, I investigate the internal migration patterns of individuals during the ages of 18-26 using nationally representative longitudinal survey data. I determine whether key life course events - starting a new job, marriage, childbearing, and entrance into college - are accompanied by residential mobility, a phenomenon I term a life course migration. I then examine the characteristics of these life course migrations, in particular the distance from the childhood home, the characteristics of destination neighborhoods, specifically the percent poverty and percent black, and the individual attributes associated with each migration type. Previous research has consistently demonstrated racial inequalities in neighborhood attainment (Sampson and Sharkey 2008). Many of these studies also show that the probability of moving out of poor, segregated areas are much lower for Blacks compared to Whites (Sharkey 2008). Therefore, this study will examine whether the racial contours of life course migrations contribute or mitigate racial inequalities in neighborhood attainment. As such, I explore whether minority youths are using life course events to strengthen or break the chains of neighborhood disadvantage that typically follow them into adulthood.

2 Life course transitions and residential mobility

Most neighborhood studies measure neighborhood context only once or over just a short period (Harding 2003; Wodtke et al. 2011). An implicit assumption underlying this measurement choice is that neighborhood characteristics do not vary over the life course either because the neighborhoods of non-mobile individuals do not change or individuals only move to neighborhoods with similar demographic profiles. Contemporary neighborhood scholars have pushed for a temporally fluid perspective on residential and neighborhood choice and setting (Briggs and Keys 2009; Quillian 2003; Timberlake 2007; Wodtke et al. 2011). Rather than capturing neighborhood characteristics at a single point in time, recent studies have measured neighborhood characteristics over an extended period. This methodological approach suggests that neighborhoods are not static features.

There are two ways to explain changes in neighborhood characteristics. First, residents remain in areas that change around them. A variety of micro and macro social and economic factors, such as targeted redevelopment by community development corporations (Vidal and Keating 2004) and broader phenomena such as suburbanization, gentrification, white flight, and fluctuations in the labor and housing markets (Massey and Denton 1988; Wilson 1987, 1996), may substantially alter neighborhood characteristics. Changes in the neighborhood environments of non-mobile residents are often small in the short term and thus take a long period of time to register (Sharkey 2012; Timberlake 2009).

The second way one's neighborhood can change over time is by residential mobility. Migration can be the quickest route out of a disadvantaged area. Indeed, in order to

break the strong link between spatial inequality and individual socioeconomic disadvantage, policymakers have focused on developing person-based programs that move individuals out of poor areas rather than place-based initiatives that improve neighborhoods. According to 2000-2013 data collected by the U.S. Bureau of Labor Statistics through their Current Population Survey, county White-Black segregation and income inequality levels[1] are lower by approximately 5% and 1%, respectively, for individuals aged 17-44 moving into a different county in the past year compared to those who did not move. These numbers suggest that residential mobility is associated with moves into less segregated and more socioeconomically balanced areas.

Past studies have found a narrow set of variables that strongly predict internal U.S. migration. In particular, researchers have linked life course transitions to migration age profiles (Lee et al. 1994; Goldscheider and Goldscheider 1999; Rossi 1980; Settersten et al. 2005; White 1994). Borrowing from Bongaarts' (1978) proximate determinants framework of fertility, Bernard and colleagues (2014) identified life course transitions as the proximate determinants that link contextual factors to the age structure of internal migration. They find that the age structure of key life course transitions mirrors migration age profiles cross-nationally, concluding that life-course metrics could be used to predict national migration age profiles.

Figure 1 shows age profiles of internal migration and four key life course transitions (LCT)- undergraduate college attendance, marriage, employment, and parenthood - by race and age. The graphs show that for both races the intensity or the proportion of the population experiencing the specific LCT at ages 17 to 44. In both graphs, the upward slope and peak for the migration curve correspond to the segments of the LCT curves where the slopes are at their highest positive values. In other words, the portion of the life course in which individuals often experience a life course event corresponds to the ages with the largest migration intensities. Migration intensity levels off when the LCT curves flatten (i.e. migration intensity decreases as fewer individuals are going to college, getting married, becoming employed, and entering parenthood). Table 1 further illustrates the strong temporal association between migration and life course events. The table shows the timing and spread for migration and each LCT, where timing is measured as the age at which migration intensity reaches its peak and the singulate mean age (Hajnal 1953) of each LCT, and spread is measured as the difference between the ages at which 25 and 75 percent of the population have completed a particular transition (Modell et al. 1976). These life course and migration metrics show that the typical ages when most of the U.S. population experiences an LCT overlap the typical ages when most individuals migrate.

While research has linked life course transitions as initiators of mobility, very few studies have examined the specific characteristics of the neighborhoods of origin and destination. The few studies that have examined changes in the neighborhood environ-

[1]Segregation is measured by the Black-White dissimilarity index, a common measure of racial segregation (Reardon and Firebaugh 2000) with a range of 0 to 1 with 1 signifying totally segregated populations. Income inequality is measured by the Gini index, which ranges from 0, when all households have equal shares of income, to 1, when one household has all the income and the rest none

ments of mobile individuals have found racial and socioeconomic differences in upward residential mobility. In an analysis of the Moving to Opportunity (MTO) program, a U.S. government initiative to test whether providing vouchers and special counseling would improve the outcomes for households who moved from inner-city neighborhoods, Clark (2008) finds no statistically significant differences in the socioeconomic and racial characteristics of mover and non-mover neighborhoods, particularly amongst African-Americans. Similarly, Crowder and South (1997) find that minority families are less likely to transition from poor to non-poor neighborhood types. In his study of intergenerational transfers of neighborhood context, Sharkey (2008) finds that approximately 70% of black children who grow up in the poorest quarter of American neighborhoods remain in the poorest quarter of neighborhoods as adults, compared to 40% of whites. Timberlake (2009) finds that non-mobile white children experience greater improvement in neighborhood SES, but mobile Black and Latino children move into equal or less disadvantaged neighborhoods. Sharkey (2012) finds similar results, but also finds that the White-Black neighborhood SES gap increases in later adulthood.

Although providing much useful information on racial differences in neighborhood SES, most of these studies have not examined neighborhood change due to residential mobility from a life course perspective. Specifically, few of these studies have linked changes in neighborhood characteristics to life course migration. Life course transitions are important markers in the transition to adulthood and signify potentially radical changes in lifestyle and behavior, including spending habits, risk taking, financial investment, and health behavior (Lareau and Weininger 2008; Schulenberg and Maggs 2002; Zaleski and Schiaffino 2000). Depending on the context and timing of the event, an LCT can lead to negative or positive life course trajectories, which can include better or worse neighborhood environments if individuals are packaging residential mobility with these LCTs. For example, a birth/migration occurrence during the transition to adulthood may lead to a different neighborhood type than if this LCT happened later. While the former may indicate a negative "turning point" in one's life trajectory (e.g. parenthood occurring before college, marriage or labor force entry), the latter may signal upward residential mobility (e.g. establishing own household).

3 Life course transitions and neighborhood change

The life course has been traditionally defined as the ordered sequence of events or role transitions that individuals experience as they age from birth to death (Elder, 1985, 1997; Pallas, 1993). Previous research has found that life course transitions often cluster between the ages of 15 and 35, and follow a predictable chronology (Shanahan 2000). In an examination of the timing and sequence of life course transitions, Neugarten et al. (1965: 711) found that there "exists what might be called a prescriptive timetable for the ordering of major life events: a time in the life span when men and women are expected to marry, a time to raise children, a time to retire."

Combining life-cycle theory with theoretical models of neighborhood attainment can help inform and suggest the types of neighborhoods individuals move into after an LCT and how these predictions may vary by race. According to the human capital

model, persons "match" their own socioeconomic status with that of their neighborhood, using, to the extent possible, their human capital to purchase residences in the most desirable neighborhoods (Alba and Logan 1991; Massey 1985). The model is closely associated with the spatial assimilation model (Massey and Mullan 1984; Massey 1985; Massey and Denton 1985), which asserts that minority groups start at the bottom of the socioeconomic ladder, and therefore are only able to purchase residence in low-SES neighborhoods. As these groups experience socioeconomic mobility through educational and occupational attainment, they convert increases in SES into upward residential mobility. The place stratification model (Logan and Molotch 1987; Logan and Alba 1993; South and Crowder 1997) contends that opportunities for residential upward mobility are restricted for minorities due to structural and social forces prohibiting ethnic minorities from encroaching upon neighborhoods that feature the best housing stock, access to areas of employment and leisure, and other amenities. We can take aspects of each of these models in combination with life-cycle theory to understand how the timing and sequence of life course events may correspond with age specific socio-economic factors, such as wages and educational attainment, and how this basket of life cycle and human capital factors taken together may lead individuals into certain neighborhood environments.

According to the life course metrics presented in Table 1, the first life course event that typically occurs first in the transition to adulthood is entrance into college. The age at which young adults go to college is concentrated at the high-school leaving age (18 years old). Individuals leaving college around this age are likely moving out of their parental homes. These individuals are often more advantaged than their non-college-going or college-going, but living-at-home peers even after controlling for high school achievement (Hoxby and Avery 2013; Mulder and Clark 2002). Therefore, they are also likely to be living in less diverse neighborhoods with lower poverty rates upon leaving for college and thus would enter poorer and more diverse areas, especially considering that four-year colleges are often located in large metropolitan areas. Differences are likely exacerbated by race, as Blacks live in more segregated and poorer neighborhoods and thus would likely experience even greater changes in racial and socioeconomic neighborhood profiles. However, because of their more disadvantaged backgrounds, Black students are either more likely to not move out of or move far away from their parental homes in order to lessen college financial costs (e.g. boarding, commute) and to continue household support (Buck and Scott 1993).

If individuals do not transition into college after high school, they likely enter the labor force. Since employment opportunities are often clustered in the urban cores of metropolitan areas, individuals may be moving into more diverse and poorer environments. However, individuals leaving the parental home for work directly after high school are more socioeconomically disadvantaged; thus, they are likely making lateral moves in neighborhood attainment. According to place stratification theory, even if Blacks have the economic resources to move into better neighborhoods, they face structural barriers to upward mobility. In this case, they may find work in better areas, but may have to commute from poor neighborhoods.

Several demographic factors, such as increasing educational attainment, female la-

bor force participation, and cohabitation rates, have increased the age at first marriage in the U.S. (Stevenson and Wolfers 2007). Although marriage has been the traditional route to leaving the parental home (Goldscheider and DaVanzo 1989), marriage before establishing independence from the parental home is often associated with lower socioeconomic status. As such, individuals marrying at an early age and moving are likely making lateral or downward moves in neighborhood mobility (Oppenheimer 1988). However, given the higher poverty rates of single than married persons, marriage may be a route out of disadvantaged neighborhoods. Individuals choosing to marry later are more likely to be more socioeconomically advantaged, but living in large metropolitan areas due to college or work. Therefore, the temporal alignment of residential mobility and marriage at the older ages may lead to moves into more socioeconomically advantaged neighborhoods.

While first childbearing is associated with mobility (Bernard et al 2014; McHugh et al. 1990), children impede residential mobility, perhaps because they increase investment in the neighborhood (South and Crowder 1998). Yet, when families with children do move, they consider a set of factors, such as school quality and safety, which are highly correlated with lower poverty and percent minority (Holme 2002). However, these factors may vary by race. Younger and socioeconomically disadvantaged families may trade off better schools and safer neighborhoods for proximity to social networks for household support and childcare (Briggs et al. 2008). Sharkey (2012) finds support for place attachment theory whereby individuals, particularly Blacks, choose to either remain home or move to nearby neighborhoods because of their attachments to places, their connections to place-based social networks, and their neighborhood preferences.

4 Data and Methods

I rely on the National Longitudinal Study of Adolescent Health, or the Add Health Study (Udry 2003), as the primary source of data for the analysis. Add Health is a nationally representative, probability-based survey of U.S. adolescents in grades 7 through 12 between 1994 and 1996 (Harris 2009). The survey is based on a multistage cluster design in which the clusters were sampled with an unequal probability. At the first stage, 80 high schools and 52 middle schools were sampled with replacement in 1994 and 1995. Approximately 20,700 adolescents were sampled from the school rosters and were administered the wave I in-home questionnaire. Approximately 14,700 wave I students were reinterviewed in 1996 (Wave II), 15,197 were reinterviewed in 2001-2002 (Wave III) when they were between the ages of 18-26 and 15,701 were reinterviewed in 2007-2008 when they were between the ages of 24-32. In this analysis, I evaluate changes in neighborhood composition from Waves I to III. The final analytic sample (N = 13,897) contains individuals who participated in both Wave I and III surveys, have valid sampling weights, acceptable geographic identifiers, and are not missing values on any of the outcome variables.

4.1 Life course migrations

In the analysis, I examine associations between individual-, household-, and neighborhood-level characteristics measured during adolescence and the occurrence of life course migrations during the transition to adulthood. I then investigate the associations between life course migrations and the spatial attributes of residential change from Wave I to Wave III. I focus on the following life course events shown to be key determinants in the transition to adulthood and important triggers of spatial mobility (Hogan and Astone 1986; Mulder 1993): undergraduate college enrollment, job change, marriage, and childbearing. Add Health provides detailed information on the timing of these life course events. The data provide complete individual histories of live birth pregnancies and marriages, and the starting months and years of undergraduate enrollment and new full-time employment (defined as 35 hours or more and not enrolled in school).

Add Health measures neighborhood change from wave to wave at the time of each interview, but does not provide a complete history of residential movement. As such, I designate an individual as a mover if he or she currently resides in a Wave III geocoded address that is different from the Wave I geocoded address. I categorize residential change from Wave I to III as follows: did not move (same address from Wave I to III), the co-occurrence of migration into the Wave III residence and college attendance, the co-occurrence of migration and marriage, the co-occurrence of migration and a live birth, the co-occurrence of migration and starting a new job, the co-occurrence of migration and more than one life course event, and migration without the co-occurrence of a life course event. Following previous work that examines the influence of life course events and migration (XXX), I define co-occurrence as migration occurring within $\pm$ 6 months of a life course event.

4.2 Dependent variables: Geographic and neighborhood characteristics

The primary goal of this study is to examine the spatial attributes of life course migrations during the transition into adulthood. I first examine the distance in miles between a respondent's geocoded Wave I and Wave III addresses. Moves of less than one-quarter mile are bottom coded to 0, while long-distance moves are top coded at 1,000 miles.

Second, I examine changes in characteristics in a respondent's neighborhood from Wave I to Wave III. Following most prior literature, I define the neighborhood at the census tract level (Sharkey 2014). The census tract is defined as a compact and homogeneous territorial unit with relatively permanent boundaries and a population of about 4,000 people. As a part of Add Health's data collection, over 2,000 neighborhood variables were extracted from the decennial Census of Population and Housing and linked to individual students. Following previous work, I use percent Black and percent of persons at or below the poverty level as measures of race and socioeconomic composition, respectively (Sharkey and Sampson 2008; Sharkey 2012; South and Crowder 1997; Timberlake 2007; Quillian 2003).

4.3 Control variables

Add Health contains a number of individual-, household-, and neighborhood-level variables hypothesized to affect residential mobility and location. These variables are used in the analysis to examine the adolescent characteristics associated with each life course migration and to control for these characteristics in order to measure the effects of a life course migration on changes in neighborhood racial and socioeconomic profiles. All control variables are measured at Wave I unless otherwise noted.

Personal characteristics include age, gender, self-reported race and ethnicity, and whether the respondent is foreign born. I also include self-reported grade point average (GPA) and expectations for college graduation (ranging from 0 = "no chance" to 3= "about 50-50" to 5 = "it will happen") to control for academic achievement and the expressed desire to obtain a college degree.

I include a measure of depression that sums up responses to survey items from the Center for Epidemiologic Studies - Depression Scale (Radloff, 1977). The CES-D asks adolescents to indicate how often the following depressive symptoms occurred in the past week (never/rarely, sometimes, a lot of the time, most/all of the time): bothered by things that usually don't bother you, poor appetite, had the blues, felt just as good as other people (reverse coded), trouble keeping mind focused, felt depressed, too tired to do things, hopeful about the future (reverse coded), felt life had been a failure, felt fearful, felt happy (reverse coded), talked less than usual, felt lonely, felt people were unfriendly, enjoyed life (reverse coded), felt sad, felt people dislike you, hard to get started doing things, and felt life not worth living.

I also include an index of delinquent behavior that sums up responses to survey items indicating how many times in the past 12 months (Never, 1 or 2 times, 3 or 4 times, or 5 or more times) that the respondent has participated in the following activities: paint graffiti, damage property, lie to parents, shoplift, get into a serious physical fight, seriously injure someone, run away from home, drive a car without permission, steal something worth more than $500, break into a building, threaten someone with a weapon, sell drugs, steal something worth less than $50, and take part in a group fight.

Parental and household characteristics include parental education (No high school degree, high school degree and some college, and college degree), whether or not the adolescent lives with both biological parents, and parental household income. To control for attachment to the adolescence residence, I include the number of years lived in Wave I residence and a measure of neighborhood satisfaction, an index summing up responses to survey items asking adolescents how happy they are with their neighborhoods (ranging from 1 = "not at all" to 3 = "somewhat" to 5 = "very much") and how happy they would be if they had to move to another neighborhood (ranging from 1 = "very unhappy" to 3 = "wouldn't make any difference" to 5 = "very happy"; reverse coded). I use multiple imputation on 10 multiply imputed datasets to replace missing data on any of the covariates.

4.4 Analysis plan

I run a series of regression models to capture the spatial attributes of life course migrations for all adolescents and disaggregated by race and ethnicity. I first examine the individual, household and neighborhood characteristics measured during adolescence that are associated with each life course migration using a series of logistic regressions of the following form:

$$log(\frac{LCM_i^t}{1 - LCM_i^t}) = \beta_0 + \alpha X_i + \delta_1 \%Poverty_i + \delta_2 \%Black_i + \epsilon_i, \quad (1)$$

where LCM_i^t is an indicator of whether individual i's move into the Wave III neighborhood co-occurred with life course event t - marriage, having a child, enrolling in college, starting a new job, or some combination of the four events - X is a set of control variables, $\%Poverty_i$ and $\%Black_i$ are the percent poverty and percent black, respectively, in the Wave I neighborhood, and ϵ_i is an error term.

Second, I examine the distance $Dist$ between the Wave I and III addresses by migration type controlling for adolescent personal, household, and neighborhood characteristics using the following linear model:

$$\begin{aligned} Dist_i = \beta_0 + \beta_1 Marriage_i + \beta_2 Child_i + \beta_3 College_i + \beta_4 NewJob_i + \\ \beta_5 Combination_i + \alpha X_i + \delta_1 \%Poverty_i + \delta_2 \%Black_i + \epsilon_i, \end{aligned} \quad (2)$$

where $Marriage_i$, $Child_i$, $College_i$, $NewJob_i$, and $Combination_i$ are a set of variables indicating whether the respondent's move to the Wave III neighborhood co-occurred with marriage, having a child, enrolling in college, starting a new job, or some combination of the four events, respectively. Individual moves not co-occurring with a life course transition act as the reference group, and thus the coefficients on each life course migration indicator represent the distance moved from Wave I to III relative to those moving but not simultaneously experiencing a life course event. The analysis is restricted to only those with different Wave I and III geocoded addresses (N = 9,403)[2]

Lastly, building on previous work decomposing change in neighborhood conditions over time (Sharkey 2012; Timberlake 2007), the analysis decomposes neighborhood change among three groups: non movers, movers experiencing a co-occurring life course event, and movers not experiencing a co-occurring life course event. I examine changes

[2]To control for selection into migration, I include in equation 2 the inverse mills ratio (Heckman 1979), which is estimated using the full analytic sample from a probit regression of whether the respondent has a different Wave III address on the set of control variables described in section 4.3. From this probit model, I estimate the linear probability $\hat{p}$ of having different Wave I and III addresses, calculate the inverse mill ratio (IMR) using the equation

$$IMR = \frac{e^{\frac{\hat{p}^2}{2}}}{\sqrt{2\pi}\Phi(\hat{p})},$$

and include IMR in equation 2.

in neighborhood percent poverty and percent black from Wave I to III for mobile individuals and those changing addresses in between waves using the following linear model estimated using ordinary least squares regression:

$$\Delta Y_i = \beta_0 + \beta_1 Marriage_i + \beta_2 Child_i + \beta_3 College_i + \beta_4 NewJob_i + \beta_5 Combination_i + \beta_6 MigNone_i + \alpha X_i + \epsilon_i, \quad (3)$$

where ΔY_i is the difference in census tract percent poverty or percent black from Wave I to III and $MigNone_i$ is a variable indicating whether respondent i moved to the Wave III neighborhood without the co-occurrence of a life course event. The reference group for the migration variables contains individuals whose Waves I and III addresses are the same. Therefore, the coefficients on the migration indicators estimate the changes in percent poverty and percent black relative to the changes experienced by those who live in the same Wave I and Wave III addresses. Finally, because place stratification theory posits that residential mobility outcomes differ by race, I include in equations 2 and 3 an interaction between each migration indicator and race to examine racial differences in the spatial attributes of life course migrations.

I include school fixed effects in all models to control for all time-invariant school-level factors common to individuals who attended the same school at Wave I. I cluster standard errors by school and weight the data by the appropriate survey weights. Add Health data only measures the timing of migration and the demographic characteristics of the Wave III residence, and thus does not capture other residential moves in between waves. Therefore, the analysis estimates the correspondence of life course events and mobility only for the current residence, captures changes at only two discrete time points, and does not consider life course migrations prior to migration into the Wave III neighborhood. Adolescents changed addresses on average two times between 1995 and the year of the Wave III survey (2001-2002). Approximately 30% of the sample had the same Wave I and III address while an additional 21% only moved once. The analysis does not measure the spatial attributes of life course migration in the first transition out of the parental home, but rather how life course migrations into the Wave III residence, measured approximately 0 to 8 years after adolescence (age 18), influences neighborhood characteristics relative to the neighborhood at adolescence. In order to control for prior mobility, the number of addresses lived in between 1995 and the time of the Wave III survey is included in all models.

5 Results

5.1 Descriptive findings

Table 2 shows descriptive statistics of the variables used in the analysis. Adolescents on average lived in Wave I neighborhoods that were 14% poor and 16% black. These percentages changed very little by Wave III. Approximately 68% of adolescents moved

out of their Wave I residence by Wave III. A significant percentage (20%) of moves coincided with a life course event, with starting a new job (7%) and going to college (5%) occurring most often with a residential move. For those who moved, the distance from the Wave III address to the adolescent residence was on average 114 miles. To put this distance in perspective, the average census tract in metropolitan areas is 13.7 square miles (Burton et al. 2011); therefore, residential changes encompassed moves across several tracts.

Tables 3 and 4 break down neighborhood characteristics and life course migration by race and ethnicity. On average, whites live in neighborhoods with significantly lower percent poverty and percent black relative to their black and Hispanic counterparts. Although blacks experience much higher levels of socioeconomic disadvantage in their neighborhoods in both waves, they are the only group that experienced a decrease in poverty rates and percent black from Waves I to III. A larger percentage of whites moved between Waves I and III (72%) and experienced a life course migration (24%). Of the five types of life course migrations, starting a new job and attending college were the most likely across all age groups, although less pronounced for Hispanics, who have the lowest overall mobility rates.

5.2 Who experiences life course migrations

Table 5 shows results from logistic regressions modelling the relationship between each life course migration and adolescent individual-, family-, and neighborhood- level characteristics. Each column shows results from a regression of whether the individual's move into the Wave III residence corresponded with a life course event on a set of Wave I variables. The coefficients represent odds ratios such that values over one represent a greater odds of experiencing a life course migration. Of the variables examined in the analysis, the number of residential moves and age are strongly associated with most migration types. The number of residential moves between Waves I and III is positively associated with all life course migrations. Similarly, age is associated with all life course migrations except for having a child. Age is positively associated with migrations co-occurring with starting a new job and multiple life course events; however, as expected, age is negatively associated with a college migration.

The first column of Table 5 shows that age, living with both biological parents, being female, neighborhood percent poverty, and the number of residential moves between Waves I and III are associated with higher odds of experiencing marriage and residential migration. In contrast, delinquent behavior and blacks relative to whites have lower odds of a marriage-migration event. Also, the number of years in the Wave I residence is associated with lower odds of a marriage-migration event, which may reflect the desire to stay at or relatively close to home to build a family.

The second column reveals that females and Hispanics relative to whites have a greater odds of experiencing a childbirth migration. In contrast, grade point average, having a parent with a college education relative to one with no high school degree and living with both biological parents are associated with lower odds of a childbirth migration. These results collaborate the strong associations found for early childbearing

and socioeconomic status. For migrations co-occurring with starting a new job, I find that other than age and number of residential moves, only grade point average is significantly associated. In this case, a higher GPA is associated with a lower odds of starting a new job and migrating, which may reflect the strong association between academic performance and choosing to enroll in college rather than entering the labor force. Not surprisingly, the probability of a college migration is strongly associated with grade point average, college aspirations, and having a parent with a college degree. Blacks are less likely than whites to bundle life course events with residential mobility as are individuals with more years lived in the Wave I residence. However, along with age and number of residential moves, living with both biological parents and percent poverty are associated with mobility co-occurring with multiple life course events.

5.3 Distance from Wave I residence

The first column of Table 6 shows results for a regression of distance between Wave I and III addresses on migration type for individuals with different Wave I and III addresses. The reference group for the set of migration indicators contain those whose residential move into their Wave III neighborhoods did not co-occur with a life course event. Figure 2 graphs the covariate adjusted average distance between Wave I and III addresses by migration type. A childbirth migration involves the shortest distance move from the Wave I residence, which likely reflects the desire to stay closer to family and social support. In contrast, a marriage migration involves the longest distance move. The asterisks represent a statistically significant difference relative to those experiencing a non life course event migration. Only migrations co-occurring with a marriage and college enrollment have move distances that are statistically different from a non life course migration. Marriage migrations on average entail move distances that are nearly 90 miles more than a non life course migration while individuals enrolling in college move approximately 50 miles more.

The overall findings may be masking important differences by race. Rather than present regression results for race-interacted models, I display the marginal effects graphically for ease of interpretation. Figure 3 graphs the covariate-adjusted average distance between Wave I and III addresses by migration type and race. Overall, all race groups find themselves significantly far away from their Wave I residences by Wave III regardless of migration type. However, whites on average move greater distances relative to other groups across all migration types. I also find that relative to non life course moves, whites experiencing marriage, new job, and college migrations move significantly farther distances. In comparison, only marriage migrations lead to significantly different move distances compared to non life course migrations for blacks. I find that distances for all life course migrations do not significantly differ from non life course migrations for Hispanics, and marriage and child migrations lead to shorter distances for individuals of another race.

In sum, adolescents who move from their adolescent residences by Wave III find themselves living in neighborhoods that are significantly far away. However, marriage migrations lead to greater distances for whites and blacks, college migrations lead to

greater distances just for whites, no life course migrations are associated with significantly different move distances compared to non life course migrations for Hispanics, and marriage and childbirth migrations lead to shorter distances for individuals of another race.

5.4 Changes in neighborhood racial composition and poverty levels

Columns 3 and 4 in Table 6 show results for regressions using the change in neighborhood percent poverty and percent black, respectively, from Wave I to Wave III as the dependent variables. Since non-movers are included in the analytic sample, the reference group for the set of migration indicators contain individuals who have the same Wave I and III addresses; therefore, the coefficients for the migration indicators compare the change in neighborhood percent poverty or percent black between adolescents having different Wave III addresses and those who do not. Focusing first on the percent poverty results shown in column 3, I find that a residential move that coincides with enrollment in college is associated with a move into a neighborhood with a poverty rate that is 6 percentage points higher than the rate in the Wave I neighborhood. A non-life course migration is associated with a 2 percentage point increase in percent poverty. In contrast, a residential move that co-occurs with more than one life course event leads to a 2.6 percentage point decrease in percent poverty. None of the other life course migrations led to statistically significant differences in percent poverty relative to the nonmobile group.

Figure 4 displays bar graphs of covariate adjusted changes in neighborhood percent poverty from Wave I to Wave III by race and migration type. The asterisks signify statistically significant differences from the nonmobile group. The bars for the nonmobile group capture change in adolescent neighborhoods. For whites, nonmobile individuals witnessed a decrease in poverty in their adolescent neighborhoods from Waves I to III. Relative to this group, I find that moves co-occurring with starting a new job and enrolling in college are associated with increases in neighborhood poverty. Moves not bundled with any life course event are also associated with higher poverty rates. In contrast to whites, nonmobile blacks witnessed a slight increase in their adolescent neighborhood poverty rates. However, those who left their adolescent residences by Wave III experienced significant decreases in neighborhood poverty. Blacks who moved and had a child, started a new job, or experienced multiple life course events moved into neighborhoods that are 4 to 8 percentage points lower in poverty relative to their Wave I neighborhoods. The bundling of multiple life course events with migration led to the greatest decrease (7.7 percentage points) in poverty, indicating that coupling multiple life course events during the transition into adulthood may be an effective means of leaving bad neighborhoods for blacks. In contrast to blacks, mobile Hispanics show no changes in neighborhood percent poverty relative to the neighborhoods of their nonmobile counterparts. Individuals of other races mimic the patterns found for whites: non-life course moves and moving for college are associated with an increase in percent poverty. However, similar to blacks, bundling multiple life course

events with residential mobility leads to a significantly lower percent poverty.

Moving on to the results for percent black, the last column in Table 6 shows that residential moves co-occurring with more than one life course event leads to a 4 percentage point decrease in percent black. Other migration types do not lead to significantly different neighborhood racial compositions from Wave I to Wave III. Figure 5 graphically presents changes in neighborhood percent black by race. I find that the neighborhoods of nonmobile whites show very little change in percent black. Similarly, all life course migrations lead to no statistically significant changes in percent black. However, whites who moved but did not also experience a life course event live in Wave III neighborhoods that are approximately 2 percentage points higher in percent black. I find a similar result for Hispanics: a non-life course migration leads to a 4 percentage point increase in percent black. However, Hispanics who move for college also experience an increase in neighborhood racial composition: Hispanics moving and enrolling in college move into neighborhoods that are 5.5 percentage points more black. Migrating individuals of other race experience no significantly different changes in percent black relative to their nonmobile counterparts. In contrast to their non black counterparts, residentially mobile blacks experienced significant changes in neighborhood percent black. In fact, all migrations led to decreases in percent black, with marriage (8 percentage points) and having a child (11 percentage points) associated with the largest decreases. Compare these results with the changes experienced by the nonmobile group: blacks who live in their adolescent neighborhoods at Wave III find that these neighborhoods increased in percent black from Wave I to III by 5.5 percentage points.

In sum, a college migration is associated with an increase in neighborhood poverty for whites and individuals of another race. In fact, movement co-occurring with another human capital related life course event - starting a new job - is also associated with an increase in percent poverty. However, these life course migrations are not associated with movement into neighborhoods with a higher percent black. Instead, whites moving for job and college related reasons find themselves in poorer, but not necessarily blacker areas. In contrast, Hispanics moving for college find themselves in neighborhoods with a substantially larger black population. However, other life course migrations are not associated with changes in neighborhood race and socioeconomic characteristics. In contrast, it is clear from the results that blacks are moving into substantially less poorer and blacker neighborhoods. Most importantly, moves co-occurring with life course events lead to even larger decreases in neighborhood disadvantage not only compared to changes in the neighborhoods of non-mobile blacks, but also decreases related to non life course migrations. Put another way, blacks moving out of their adolescent neighborhoods during the transition into adulthood find themselves in more socioeconomically advantaged areas, but residential mobility tied to a life course event provides even greater beneficial changes.

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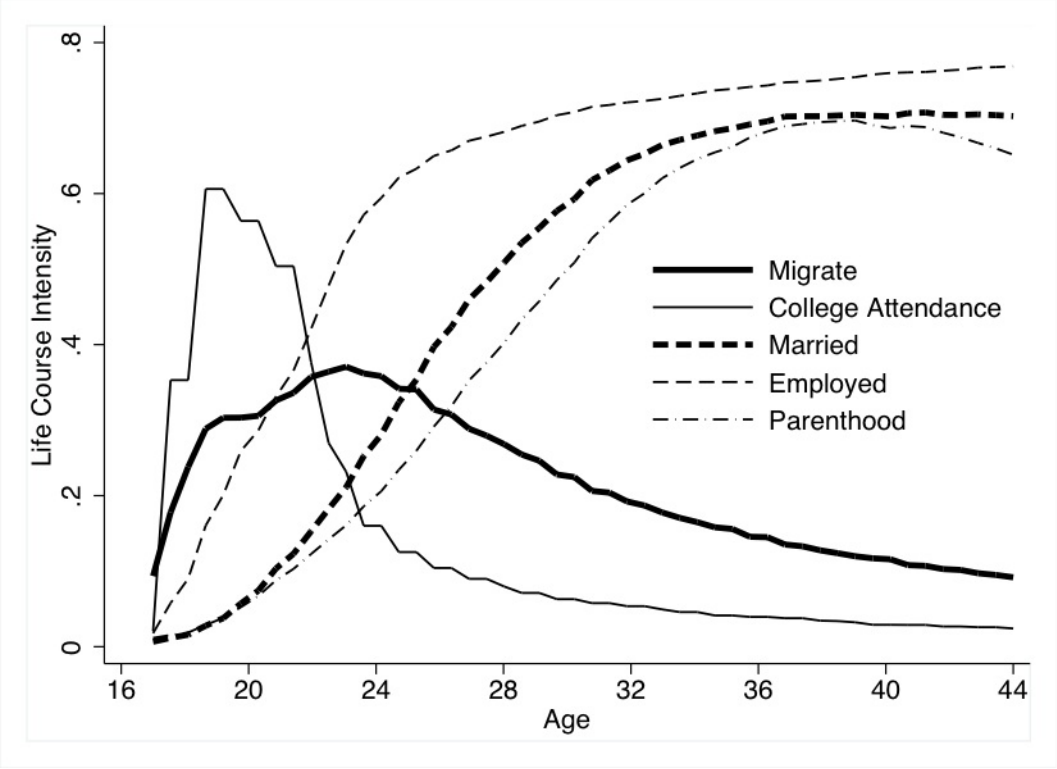
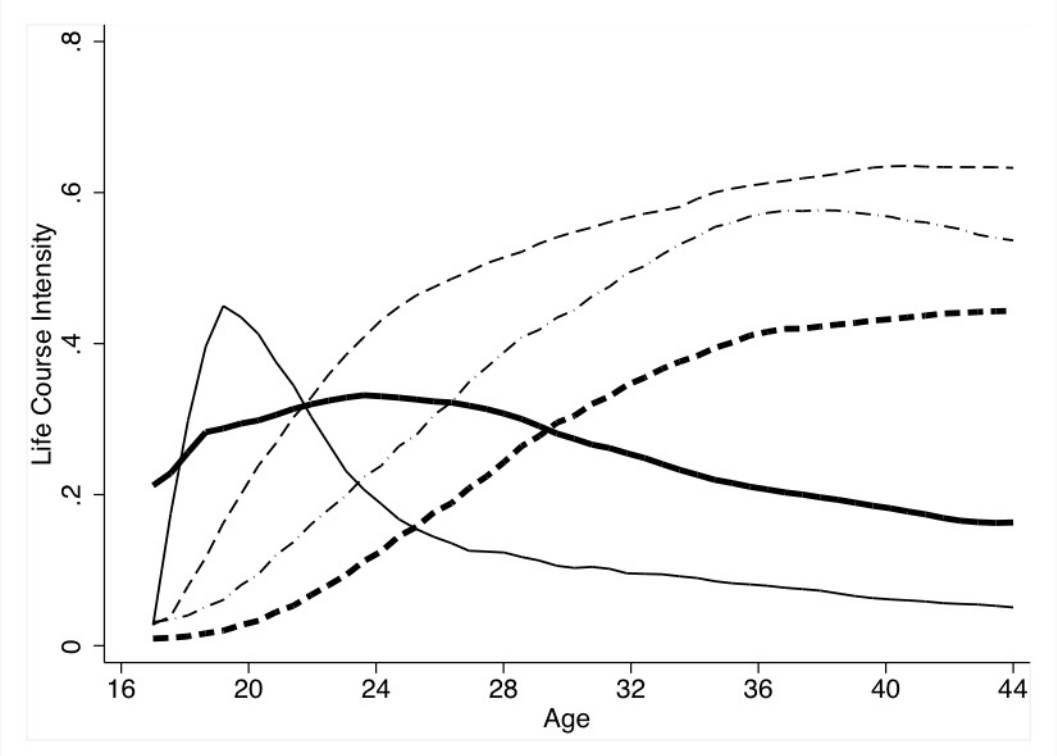
7 Figures



(a) White



(b) Black

Figure 1: Percent of the US population by life course event, age and race (Source: American Community Survey 2006-2010

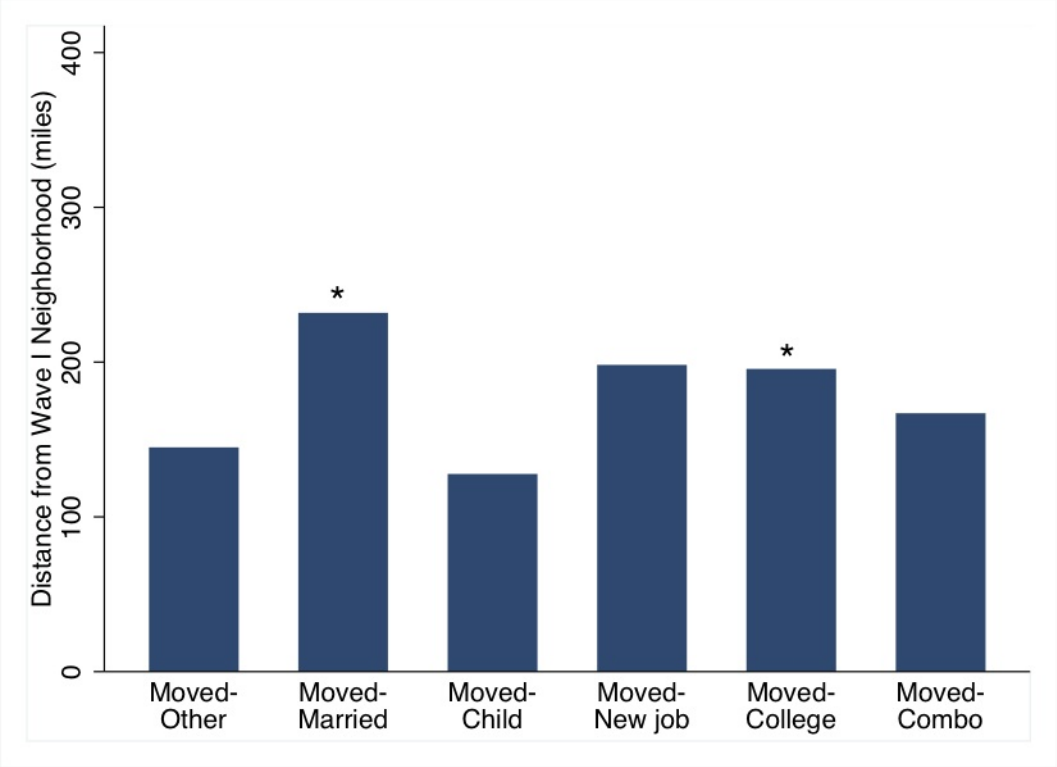
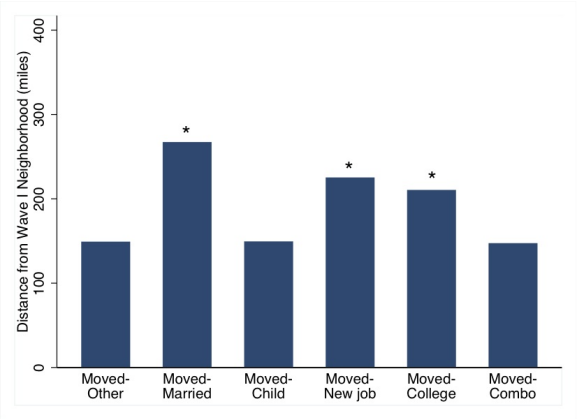


Figure 2: Distance between Wave I and III residences by migration type. Asterisks indicate statistically significant difference from Moved-Other (***p $<$ 0.001, ** p $<$ 0.01, * p $<$ 0.05)



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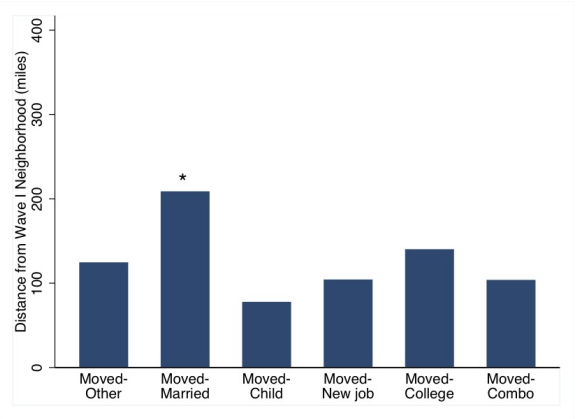

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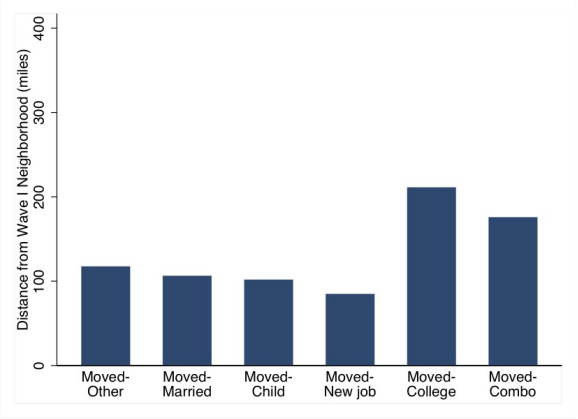
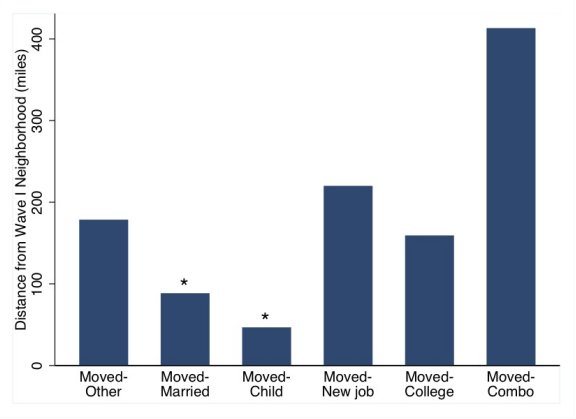
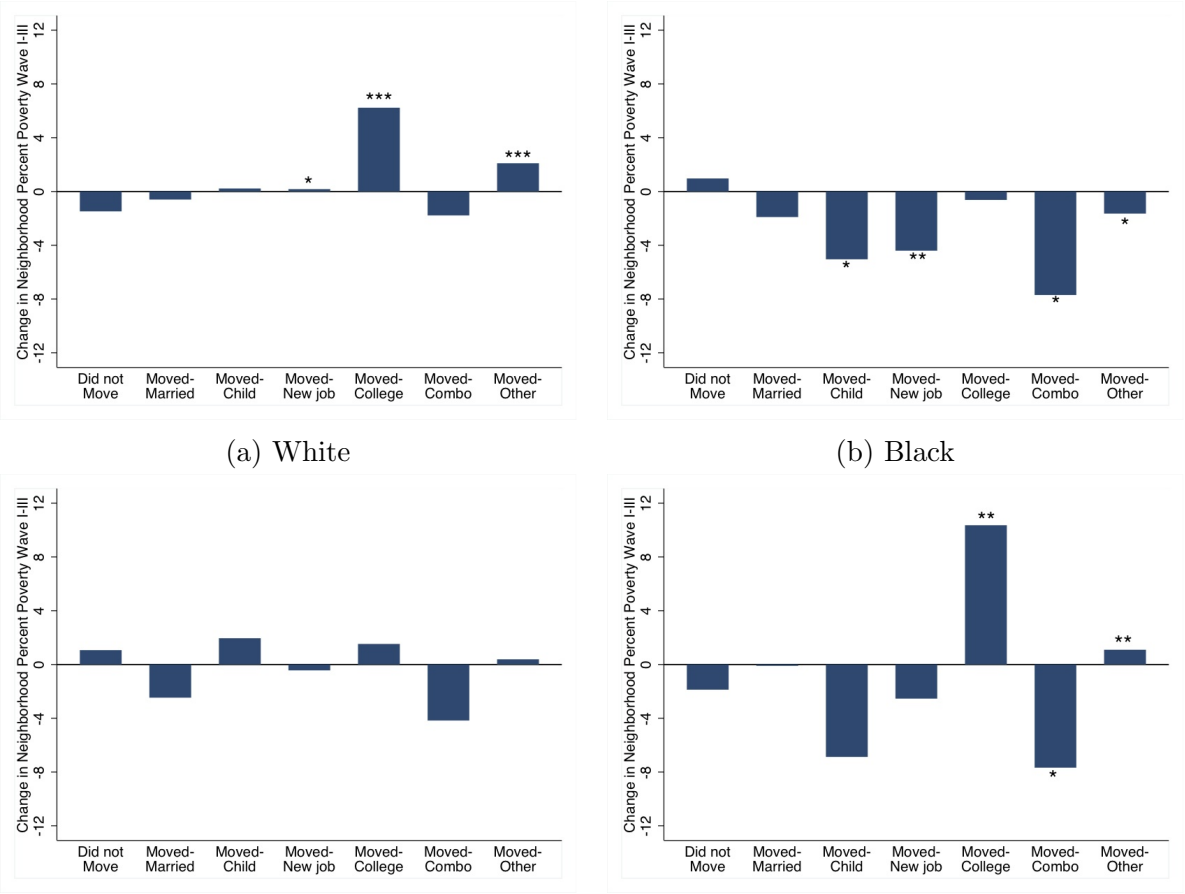


(c) Hispanic



(d) Other

Figure 3: Distance between Wave I and III residences by race and migration type. Asterisks indicate statistically significant difference from Moved-Other (***p $<$ 0.001, ** p $<$ 0.01, * p $<$ 0.05)



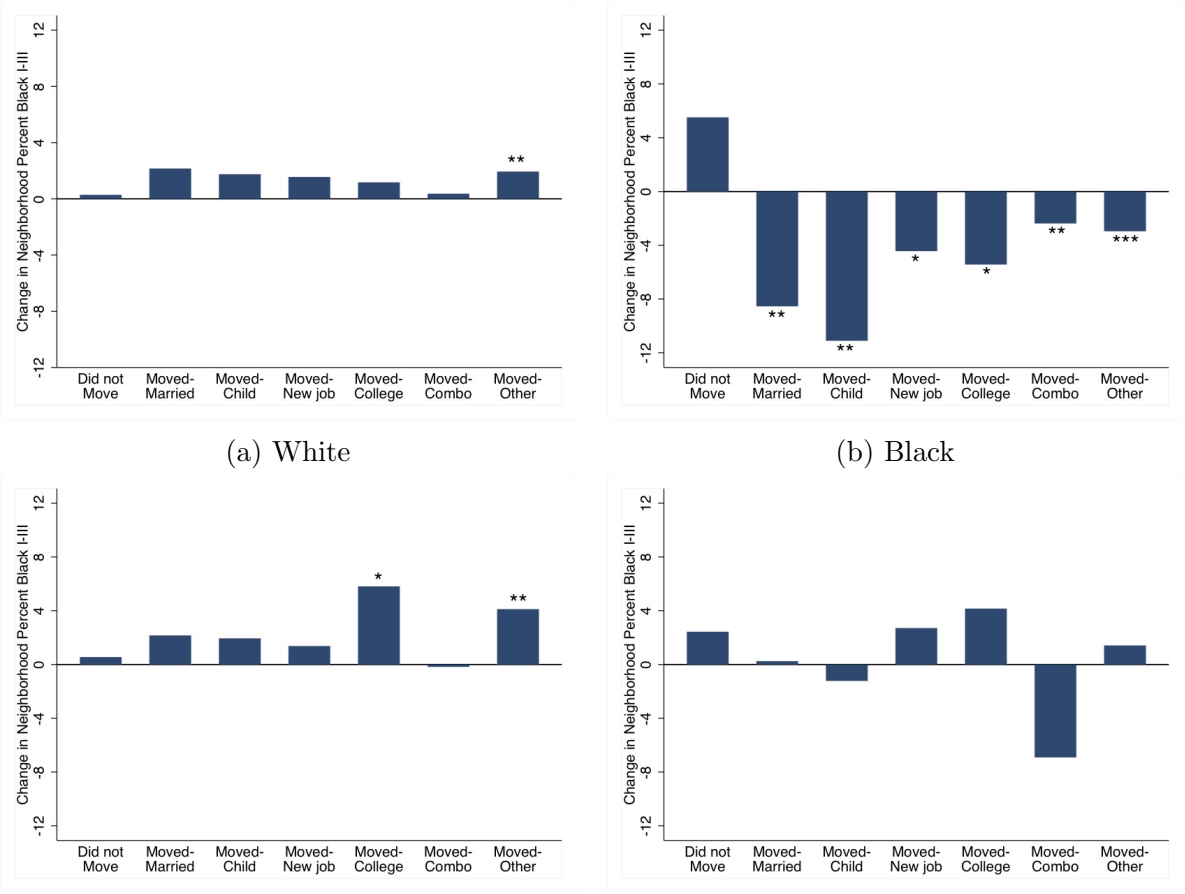
(a) White

(b) Black

(c) Hispanic

(d) Other

Figure 4: Change in neighborhood percent poverty from Wave I to III by race and migration type. Asterisks indicate statistically significant difference from Did not move (***p $<$ 0.001, ** p $<$ 0.01, * p $<$ 0.05)



(a) White

(b) Black

(c) Hispanic

(d) Other

Figure 5: Change in neighborhood percent black from Wave I to III by race and migration type. Asterisks indicate statistically significant differences from Did not move (***p $<$ 0.001, ** p $<$ 0.01, * p $<$ 0.05)

8 Tables

Table 1: Life-course transition and migration timing and spread

	White		Black	
	Singulate Mean Age†	Spread††	Singulate Mean Age†	Spread††
Migration	23.0*	22-33	24.0*	22-35
College attendance	18.3	18-20	19.9	19-20
Employed	23.3	19-24	23.6	19-25
Marriage	27.9	23-29	30.1	24-31
Parenthood	25.9	21-29	23.1	19-25

†The average length of life not experiencing the LCT expressed in year.
††Ages at which 25 percent and 75 percent of the population that have completed a particular transition. Normalized to the proportion of the population that has reached a particular status by age 44
*Age at peak migration rate
Values calculated for the population between the ages of 17 to 44
Source: American Community Survey 2006-2010

Table 2: Descriptive Statistics of Analytic Sample (N = 13,897)

	Mean	SD
Dependent variables		
Wave I % poverty	0.14	0.12
Wave III % poverty	0.15	0.12
Δ % poverty Wave I-III	0.01	0.13
Wave I percent black	0.16	0.26
Wave III percent black	0.17	0.25
Δ % black Wave I-III	0.01	0.18
Distance from Wave I residence‡	113.98	392.73
Migration type		
Did not move	0.32	
LCM* - Got married	0.03	
LCM* - Had a child	0.03	
LCM* - Started a new job	0.07	
LCM* - Enrolled in college	0.05	
LCM* - More than one life course event	0.02	
Non-LCM move	0.47	
Control variables†		
Female	0.53	
Race: Non-Hispanic White	0.52	
Race: Non-Hispanic Black	0.19	
Race: Hispanic	0.16	
Race: Other	0.12	
Age	15.65	1.73
Grade point average	2.78	0.77
Foreign-born	0.08	
Parental Education: No High School	0.12	
Parental Education: High School	0.54	
Parental Education: College	0.34	
Lives with biological parents	0.54	
Parental/Household Income ($1,000s)	45.86	51.54
Delinquent Behavior	4.22	5.17
Depression	11.29	7.60
College expectations	4.17	1.14
Neighborhood satisfaction	7.45	1.89
Years at Wave I residence	7.34	5.67
Number of times moved Wave I-III	2.01	2.13

*Life course migration: Migration to Wave III residence occurring within ± 6 months of a life course event.

† All control variables measured at Wave I unless otherwise noted.

‡ For the 9,403 individuals with different Wave I and III addresses.

Source: National Longitudinal Study of Adolescent Health, Add Health.

Table 3: Wave I and II neighborhood characteristics by race

	Percent poverty		Percent black	
	Wave I	Wave III	Wave I	Wave III
White	0.11	0.13	0.05	0.07
Black	0.24	0.22	0.54	0.5
Hispanic	0.16	0.16	0.09	0.1
Other	0.11	0.14	0.1	0.12

Source: National Longitudinal Study of Adolescent Health, Add Health.

Table 4: Race by life course migration (LCM)

Migration type	White	Black	Hispanic	Other
% Did not move	0.28	0.35	0.39	0.38
% LCM - Got married	0.04	0.02	0.04	0.02
% LCM - Had a child	0.03	0.03	0.03	0.02
% LCM - Started a new job	0.09	0.05	0.05	0.07
% LCM - Enrolled in college	0.06	0.05	0.03	0.05
% LCM - Combination	0.03	0.01	0.03	0.01
% Non LCM move	0.48	0.48	0.43	0.45
N	7,240	2,688	2,292	1,677

Life course migration: Migration to Wave III residence occurring within ± 6 months of a life course event.
Source: National Longitudinal Study of Adolescent Health, Add Health.

Table 5: Results of logit regressions of life course migration type on Wave I characteristics

	Got married	Had a child	Started a new job	Enrolled in college	More than one life course event
Female	1.742***	1.878***	0.864	0.858	1.166
	(0.193)	(0.272)	(0.072)	(0.089)	(0.197)
Race†: Non-Hispanic Black	0.310***	0.847	0.740	0.954	0.390*
	(0.093)	(0.234)	(0.139)	(0.184)	(0.179)
Race†: Hispanic	0.869	1.528*	0.722*	0.864	1.174
	(0.156)	(0.293)	(0.099)	(0.176)	(0.261)
Race†: Other	0.786	0.673	0.882	0.988	0.991
	(0.191)	(0.169)	(0.152)	(0.172)	(0.321)
Age	1.264***	1.031	1.129***	0.760***	1.110*
	(0.042)	(0.036)	(0.031)	(0.026)	(0.050)
Grade point average	0.949	0.679***	0.861**	1.444***	0.932
	(0.059)	(0.060)	(0.049)	(0.125)	(0.077)
Foreign-born	0.818	0.713	0.915	1.371	0.727
	(0.209)	(0.201)	(0.164)	(0.311)	(0.257)
Parental Education††: High School	0.998	0.918	1.141	1.117	1.076
	(0.180)	(0.157)	(0.162)	(0.278)	(0.297)
Parental Education††: College	0.844	0.635*	1.150	1.643*	0.886
	(0.175)	(0.142)	(0.198)	(0.411)	(0.282)
Lives with biological parents	1.321*	0.744*	1.148	0.857	1.390*
	(0.145)	(0.087)	(0.122)	(0.098)	(0.231)
Parental/Household Income	0.998	0.999	1.001	1.002	0.999
	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)
Delinquent Behavior	0.963**	1.014	0.997	1.002	0.984
	(0.014)	(0.010)	(0.009)	(0.010)	(0.017)
Depression	0.991	1.003	0.996	0.990	1.001
	(0.008)	(0.008)	(0.006)	(0.007)	(0.013)
College expectations	1.016	0.936	1.026	1.216**	0.984
	(0.056)	(0.056)	(0.039)	(0.077)	(0.067)
Number of times moved Wave I-III	1.120***	1.202***	1.280***	1.153***	1.180***
	(0.024)	(0.024)	(0.021)	(0.023)	(0.029)
Wave I Neighborhood Characteristics					
Neighborhood satisfaction	1.016	0.987	1.014	0.972	1.008
	(0.032)	(0.035)	(0.025)	(0.026)	(0.060)
Years at Wave I residence	0.980*	0.987	0.995	0.993	0.970*
	(0.009)	(0.012)	(0.007)	(0.010)	(0.013)
Percent poverty	7.938***	2.537	2.036	0.864	7.011**
	(4.502)	(1.584)	(0.842)	(0.451)	(5.026)
Percent black	0.913	1.303	0.928	1.125	1.643
	(0.396)	(0.600)	(0.238)	(0.358)	(1.075)
Intercept	0.001***	0.056***	0.009***	0.492	0.003***
	(0.001)	(0.041)	(0.005)	(0.351)	(0.003)
N	13,897	13,897	13,897	13,897	13,897

*** $p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Standard errors clustered by school are in parentheses. All models include school fixed effects. Results adjusted for sampling weights. Coefficients represent odd ratios.

† Reference group: Non-Hispanic white. †† Reference group: Less than high school degree

Table 6: OLS regressions of Wave I-III neighborhood changes on migration type and control variables

	Distance from Wave I residence‡	Change in % Poverty	Change in % Black
Migration type			
Life course migration: Got married	86.910*	-0.005	-0.002
	(42.108)	(0.008)	(0.012)
Life course migration: Had a child	-17.197	-0.002	-0.021
	(25.415)	(0.010)	(0.017)
Life course migration: Started a new job	53.302	-0.001	-0.005
	(29.759)	(0.007)	(0.009)
Life course migration: Enrolled in college	50.678*	0.060***	-0.004
	(20.032)	(0.014)	(0.012)
Life course migration: More than one	22.138	-0.026*	-0.041*
	(31.239)	(0.011)	(0.019)
Non life course migration		0.019**	0.000
		(0.006)	(0.006)
Control variables			
Female	-10.905	-0.004	-0.003
	(14.356)	(0.003)	(0.004)
Race†: Non-Hispanic Black	-41.208	-0.021**	-0.026*
	(40.598)	(0.007)	(0.013)
Race†: Hispanic	-43.586	-0.002	0.011
	(23.271)	(0.006)	(0.008)
Race†: Other	14.519	-0.009	0.003
	(32.067)	(0.007)	(0.009)
Age	-7.449	-0.004*	-0.003
	(5.495)	(0.002)	(0.002)
Grade point average	33.371***	0.010***	-0.001
	(9.461)	(0.002)	(0.003)
Foreign-born	29.441	-0.006	0.009
	(34.416)	(0.007)	(0.007)
Parental Education††: High School	3.371	0.007	0.012
	(16.120)	(0.005)	(0.008)
Parental Education††: College	44.875*	0.019***	0.012
	(19.178)	(0.005)	(0.008)
Lives with biological parents	-3.731	0.007*	0.004
	(13.600)	(0.003)	(0.005)
Parental/Household Income	0.182	0.00008*	0.000
	(0.189)	(0.000)	(0.000)
Delinquent Behavior	-1.141	0.000	0.000
	(1.162)	(0.000)	(0.000)
Depression	-0.459	0.000	0.000

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Table 6 – *Continued from previous page*

	Distance from Wave I residence‡	Change in % Poverty‡‡	Change in % Black‡‡
	(0.716)	(0.000)	(0.000)
College expectations	7.989	-0.001	0.002
	(4.676)	(0.001)	(0.002)
Number of times moved between Wave I-III	32.762***	0.003***	0.001
	(9.024)	(0.001)	(0.001)
Wave I Neighborhood Characteristics			
Neighborhood satisfaction	-6.883*	0.003**	0.003**
	(3.291)	(0.001)	(0.001)
Years at Wave I residence	1.062	-0.001	0.000
	(1.247)	(0.000)	(0.000)
Percent poverty	-274.958		
	(188.446)		
Percent black	181.645		
	(119.703)		
Intercept	102.993	-0.012	-6.75E-06
	(125.857)	(0.028)	(0.032)
N	9,403	13,897	13,897

*** $p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Standard errors clustered by school are in parentheses. All models include school fixed effects.

Results adjusted for sampling weights.

‡Includes only individuals who moved from Wave I to Wave III. Model includes inverse Mills ratio to account for selection into migration. Reference group for migration type is non life course migration.

‡‡Reference group for migration type is same Wave I and III addresses.

† Reference group: Non-Hispanic white. †† Reference group: Less than high school degree.