Divergent Pathways: Racial/Ethnic Inequalities in Wealth and Health Trajectories

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Abstract
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Divergent Pathways: Racial/Ethnic Inequalities in Wealth and Health Trajectories
(Under the direction of Glen H. Elder, Jr., Barbara, Etwisle, Ted Mouw, Peggy Thoits, and Peter Uhlenberg)

Extensive empirical evidence documents racial/ethnic disparities in both wealth and health: compared to Whites, Hispanics and Blacks have considerably less wealth and worse health. However, it remains unclear why racial/ethnic inequalities in wealth and health emerge, and whether these inequalities decrease, remain stable, or increase with age. This dissertation aims to fill these gaps in the literature by drawing on life course perspectives and methods to investigate racial/ethnic differences in wealth and health *trajectories* (i.e., long-term patterns of intra-individual change and stability in wealth and health with age) and how social disadvantage contributes to racial/ethnic wealth and health disparities.

The first empirical chapter utilizes panel data from the National Longitudinal Study of Youth (NLSY), a nationally representative survey, and growth curve models to examine racial/ethnic differences in wealth trajectories between ages 21 and 45. Findings reveal that relatively small wealth gaps between Whites, Blacks and Hispanics exist in their early 20s, but these initial inequalities are magnified with age. In the second substantive chapter, data from the Health and Retirement Study (HRS), a nationally representative, longitudinal dataset is used to examine whether racial/ethnic wealth gaps narrow, remain stable, or widen between during the years leading up to retirement (ages 51 and 73). Results show that Whites experience more rapid rates of wealth accumulation than their minority counterparts during middle and later life, resulting in accelerating wealth disparities with age, consistent with a

process of cumulative disadvantage. At age 73, the average White household has a net worth of approximately $122,000, whereas both Hispanic and Black household have less than $5,000. Substantial racial/ethnic disparities in wealth trajectories persist after controlling for group differences in life course capital suggesting that other factors such as racial/ethnic differences in portfolio composition, financial transfers, and exposure to discrimination may contribute to wealth disparities. The third substantive chapter uses HRS data to examine racial/ethnic differences in health trajectories. Results indicate that there are dramatic racial/ethnic disparities in both the *levels* and *rates of change* in health. Overall, findings from this study show that racial/ethnic inequalities result in divergent aging experiences for Black, Hispanic, and White Americans.

To my grandparents, Rev. Haywood and Mrs. Ruth Lee Brown

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Chapter 1: Introduction

Both wealth and health are excellent barometers of inequality in a society given their cumulative nature. One's stock of wealth at a given point in time is a consequence of long-term savings and consumption patterns that have been influenced by decisions, opportunities and barriers over the life course. Likewise, health outcomes are shaped by concurrent as well as prior health behaviors, access to resources, and exposure to risks. Extensive empirical evidence documents racial/ethnic disparities in both wealth and health: compared to Whites, Hispanics and Blacks have considerably less wealth (Conley 1999; Oliver and Shapiro 1995) and worse health (CDC 2004; Williams and Jackson 2005). However, research on racial stratification in wealth and health has failed to adequately address issues of temporality. Although research has shown that large racial/ethnic disparities exist in middle and late adulthood, there have been few empirical studies of the diverse pathways leading to such heterogeneity among the aged. Thus, it remains unclear as to when, how and why racial/ethnic inequalities in wealth and health emerge, and whether these inequalities decrease, remain stable, or increase with age.

This dissertation aims to fill these gaps in the literature by investigating racial/ethnic differences in wealth and health *trajectories* (i.e., long-term patterns of intra-individual change and stability in wealth and health with age) and how social disadvantage contributes to racial/ethnic wealth and health disparities. The life course principle of *life-span development* defines human development and aging as life long processes (Elder 1998). This study draws on life course perspectives to better understand how wealth and health

inequalities evolve over the life-span. Wealth and health are not fixed, but rather vary across life stages. Thus, understanding racial/ethnic differences in social and developmental processes such as wealth accumulation and health decline require a long-term perspective and longitudinal data.

In theory and evidence, wealth and health are influenced by the interaction of various forms of life course capital (e.g., human, economic, social, and health capital) over time (O'Rand 2006). A major theme of life course research is that well-being is shaped by the intersection of biography and history (Elder 1998). Racially stratified opportunity structures result in the accumulation of disadvantages for minorities and disparate aging experiences (Brown and Warner 2008). Importantly, Blacks and Hispanics are disadvantaged relative to their White counterparts on an array of outcomes including social origins, socioeconomic status, inter-generational transfers, marriage, health behaviors, and neighborhood conditions—key predictors of wealth and health (Newman 2003). Given the dramatic disadvantages experienced by minorities, both the levels and rates of intra-individual change in wealth and health are likely to vary by race/ethnicity.

This dissertation is organized as three separate articles. Each article is based on nationally representative, longitudinal data, growth curve models, as well as the overarching framework of the life course in studies of whether racial/ethnic inequalities decrease, remain stable, or increase with age. The study has three specific aims:

Aim 1: To investigate how wealth trajectories differ by race/ethnicity between early and middle adulthood. Understanding savings and investment behavior in early life is important because assets often appreciate and compound over time, having significant consequences for economic mobility and wealth holdings by mid-life. A small but growing

body of research has documented racial/ethnic disparities in levels of wealth. However, less is known about how the process of wealth accumulation across the life course varies by race/ethnicity. Analyses 1) assess whether the minority-White wealth gap (in terms of net worth and net financial assets) decreases, remains stable or increases with age, and 2) determine the extent to which racial/ethnic differences in various forms of life course capital (social origins, education, earnings, inheritances, family patterns, local unemployment rate, and region) explain racial/ethnic disparities in wealth trajectories.

Aim 2: To examine racial/ethnic inequalities in wealth trajectories between middle and late adulthood. Personal savings and investments are a critical source of economic security during the retirement years. It is well-established that Blacks and Hispanics have less wealth than Whites at midlife (Smith 1995), but it is unclear whether the wealth gaps widen or narrow during the transition to later-life. Analyses: 1) investigate whether there are racial/ethnic differences in wealth intercepts (initial levels) and slopes (annual rates of change in wealth), and 2) determine the extent to which racial/ethnic differences in life course capital (social origins, education, earnings, social security income, inheritances, family patterns, health, financial planning horizon, subjective life expectancy, and region) account for racial/ethnic disparities in wealth trajectories.

Aim 3: To investigate racial/ethnic disparities in health trajectories between mid- and late-life. Though research consistently demonstrates that minorities have poorer health than Whites, few studies have examined how health intercepts and slopes vary by race/ethnicity among older adults. Analyses: 1) determine whether health disparities (in terms of chronic conditions and functional limitations) decrease, remain stable, or increase with age, and 2)

assess the extent to which racial/ethnic differences in life course capital (social origins, SES, social support, and health behaviors) explain racial/ethnic disparities in health trajectories.

Significance of Wealth Inequalities

Racial/ethnic disparities in economic security are well-documented. On average, Blacks and Hispanics are disadvantaged, compared to Whites, in terms of poverty rates and income (Moon and Juster 1995; U.S. Census 2000), yet there has been considerably less research on racial/ethnic inequalities in wealth. Documenting and eliminating disparities in wealth is important because wealth is a broad indicator of economic well-being that measures the accumulation of assets over time. Importantly, capital can be used to pay for college, make a down payment on a home, or start a business, prominent keys to upward economic mobility. Moreover, an individual's stock of wealth cushions the costs associated with unexpected economic hardships such as being laid off, medical expenses and divorce, and can be passed on to future generations (Keister 2000). In addition, wealth represents a source of retirement income and influences retirement timing.

Understanding wealth accumulation processes is especially important as the baby boom cohort approaches retirement age. The metaphor of a "three-legged stool" is often used to characterize the three major sources of retirement income (i.e., pensions, Social Security, and savings) in order to convey the idea that all three approaches are needed to provide stable income security in retirement. However, pensions have recently become a less reliable source of income as many employers have shifted to providing pensions that are less costly to them, yet more costly and less generous to employees. Also, the increasing old-age dependency ratio has sparked a great deal of concern and speculation about the future solvency of the

Social Security System. Thus, personal savings and investments (i.e., wealth) are likely to become increasingly important sources of economic security in mid- and late-life.

Research on the wealth of older racial/ethnic minorities is especially important as the composition of the elderly population is projected to become more diverse over the next half century, with dramatic increases in the proportion of older Blacks and Hispanics (U.S. Census, 2004). Blacks and Hispanics have significantly less pre-retirement wealth (Smith, 1995), yet it remains unclear whether racial/ethnic wealth disparities decrease, remain stable, or increase as individuals approach retirement. According to the *life-cycle hypothesis*, rational actors should accumulate wealth until they retire, whereupon they begin dissaving, resulting in wealth levels that increase until the modal age of retirement, after which they decline (Modigliani and Brumberg 1954; Modigliani 1986). Because this hypothesis has not been adequately tested with 1) longitudinal data, 2) growth curve models, and 3) a racially diverse sample, the life-cycle wealth patterns of Blacks, Hispanics, and Whites remain unclear.

Health Disparities

The health of older Americans is improving, yet dramatic health disparities between Whites and racial/ethnic minorities exist, and do not appear to be narrowing over time (Martin et al. 2007). Research on the relative well-being of older minorities is particularly important in light of both population aging and 'browning' (U.S. Census 2004). An abundance of empirical research shows that minorities experience poorer health than Whites on a wide array of outcomes including diabetes, arthritis, hypertension, strokes, heart disease, and functional limitations (Blackwell, Collins, and Coles 2002; CDC 2004; Elo and Preston 1997; Kelley- Moore and Ferraro 2004; Manton and Gu 2001; Markides et al. 1997;

Schoenbaum and Waidmann 1997; Williams 2005). Moreover, compared to Whites, Blacks have shorter life expectancies, higher all-cause mortality rates, and mortality due to diseases of the heart, malignant neoplasms, and cerebrovascular diseases (Elo and Preston 1997; National Center for Health Statistics 2003).

Two primary goals of *Healthy People 2010*—a comprehensive, nationwide health promotion and disease prevention agenda—are to increase the quality and years of healthy life, and eliminate health disparities. To achieve these goals, it is necessary to understand patterns of intra-individual changes in health with age, and how these processes differ across racial/ethnic groups. Though racial/ethnic disparities in *levels* of physical and functional health are well-documented, less is known about racial/ethnic differences in chronic condition and functional limitation *trajectories*.

Life Course Themes

The life course perspective is primarily focused on explaining long-term, intra-individual patterns of stability and change, consistent with person-centered approaches to aging (Singer and Ryff 2001). Contrasting with this are most social science theories, which mainly provide explanations for between-person differences (e.g., human capital theory and theories of stress processes). Whereas a within-person design would focus on patterns of intra-individual change in wealth and health with age, a between-person approach could be used to examine racial/ethnic differences in wealth and health. This dissertation is unique in that it simultaneously utilizes both within- and between-person approaches to investigate racial/ethnic differences in the long-term patterns of stability and change in wealth and health. This approach is consistent with Linda George's (forthcoming) assertion that the

cross-fertilization of life course perspectives and analyses with conventional social science theories has considerable utility for explaining diverse aging experiences.

Three competing hypotheses are explicitly tested in this study of racial/ethnic differences in wealth and health trajectories. The *aging-as-leveler hypothesis,* proposed by Dowd and Bengtson (1978), posits that aging involves negative consequences for both advantaged and disadvantaged populations, and that those with advantages earlier in life have the most to lose in later-life. Therefore, racial/ethnic disparities in wealth and health should attenuate with age. The *status maintenance hypothesis* asserts that intracohort stratification is constant as the cohort ages. Sociodemographic and human capital factors have persistent effects on well-being over time (see Henretta and Campbell 1976). According to this hypothesis, one would predict racial/ethnic inequalities in wealth and health to remain stable with age (e.g., Clark and Maddox 1992). Alternatively, the *cumulative advantage/disadvantage* or *double jeopardy hypothesis* posits that intracohort inequality increases as the cohort ages (Dannefer 1987; 2003; Ferraro and Farmer 1996; O'Rand 1996). Disadvantages early in life shape social and developmental pathways and lead to subsequent disadvantages. Thus, racial/ethnic inequalities in wealth and health are hypothesized to increase with age.

To explain racial/ethnic inequalities in wealth and health trajectories, all three chapters examine the mediating role of racial/ethnic differences in life course capital. The concept of life course capital refers to the array of resources individuals possess including human, social, psychophysical, and personal capital (O'Rand 2006). *Human capital* consists of one's 'stock' of productive skills and knowledge that can be used to generate income (Becker 1964; Rosen 1998). The stock of social relationships which play an instrumental role

in individuals' lives can be thought of as *social capital* (Coleman 1990; Lin 1999; Portes 1998). *Psychophysical capital* refers to one's stock of health and well-being. The stock of personal attributes such as resiliency, positive affect, and self-efficacy can be conceptualized as *personal capital* (see Bandura 1995; Thoits 1991). Importantly, these various forms of life course capital are dynamic and interrelated, influencing one another in a reciprocal fashion over time (O'Rand 2006). Consistent with O'Rand's (2006) notion of a *cumulative advantage-cumulative hardship* pattern, the central thesis of the study is that, compared to Whites, Blacks and Hispanics have lower initial levels of nearly all forms of life course capital, and these forms interact and are compounded over time resulting in enduring and increasing wealth and health inequalities with age.

Outline of the Dissertation

In chapter 2, I investigate several questions about how the *process* of wealth accumulation varies by race/ethnicity between early and middle adulthood. At what age does the wealth gap emerge? Do racial/ethnic wealth inequalities decrease, remain stable or increase with age? In addition, I assess the extent to which racial/ethnic differences in various forms of life course capital (i.e., social origins, education, earnings, inheritances, family patterns, local unemployment rate, and region) account for racial/ethnic disparities in wealth trajectories. Panel data from 11 waves of the National Longitudinal Study of Youth, a nationally representative survey, and random coefficient growth curve models are utilized to examine racial/ethnic differences in wealth trajectories between ages 21 and 45. On the whole, the results are consistent with the cumulative disadvantage hypothesis. Relatively small wealth gaps between Whites, Blacks and Hispanics exist in their early 20s, but these initial inequalities are magnified with age, resulting in enormous wealth gaps by midlife.

Substantial racial/ethnic disparities in wealth trajectories persist after controlling for group differences in life course capital, suggesting that other factors such as racial/ethnic differences in savings rates, portfolio composition, returns on investments, financial transfers, and exposure to discrimination may contribute to wealth disparities.

In chapter 3 the focus shifts to examining racial/ethnic differences in wealth trajectories during the transition from mid- to late-life. This chapter uses data from the Health and Retirement Study (HRS), a nationally representative, longitudinal dataset with oversamples of Blacks and Hispanics. Respondents were interviewed biennially between 1992 and 2004 for a total of 7 waves. Random coefficient growth curve models are employed to estimate racial/ethnic differences in wealth trajectories between ages 51 and 73. Findings show that wealth trajectories vary dramatically by race/ethnicity. By midlife, large disparities in net worth and net financial assets have emerged. Moreover, Whites experience much more rapid rates of wealth accumulation during their 50s and 60s than their minority counterparts, resulting in accelerating wealth disparities with age, consistent with a process of cumulative disadvantage. Even after controlling for racial/ethnic inequalities in life course capital, Hispanics and Blacks are at a major disadvantage, compared to Whites, both in terms of wealth levels and growth with age.

Chapter 4 investigates racial/ethnic differences in chronic health problems and functional limitation *age-trajectories* (i.e., long-term, intra-individual rates of stability and change in health with age). More specifically, I examine whether racial/ethnic health disparities decrease, remain stable or increase with age. Additionally, I assess the extent to which racial/ethnic differences in various forms of life course capital (i.e., social origins, SES, social support, and health behaviors) explain disparities in health intercepts (initial

health status) and slopes (rates of change). Seven waves of panel data from the HRS and growth curve models are used to estimate health trajectories between ages 51 and 73. Findings indicate that there are dramatic racial/ethnic disparities in health trajectories. While status leveling, status maintenance, and cumulative disadvantage theories are often framed as competing perspectives, there is evidence that supports all three, depending on the health outcome and life stage being analyzed.

This study extends previous research in several respects. First, this study utilizes two high-quality, longitudinal datasets (NLSY and HRS). Second, racial/ethnic differences in intraindividual changes in wealth and health on numerous occasions are investigated. Third, I estimate long-term trajectories. Fourth, respondents who attrit are included in the analyses. And fifth, intraindividual change is modeled as a function of age instead of time, consistent with life course theory (e.g., aging-as-leveler, status maintenance, cumulative disadvantage and life cycle hypotheses). This study is among the first to both conceptualize and measure age-trajectories of wealth and health for Blacks, Hispanics, and Whites. By using a life course perspective, growth curve models, and two high-quality, longitudinal datasets, the aim of this dissertation is to improve our understanding of how racial/ethnic inequalities unfold over the life course.

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Chapter 2: Racial/Ethnic Inequalities in Wealth Trajectories, Early to Middle Adulthood

Introduction

An abundance of research has documented racial/ethnic differences in economic well-being. Compared to Whites, Blacks and Hispanics have been shown to be significantly disadvantaged in terms of poverty rates and income (Moon and Juster 1995; U.S. Census 2000), yet there has been considerably less research on racial/ethnic inequalities in wealth. Understanding disparities in wealth is particularly important because wealth is a broad indicator of economic well-being that measures the accumulation of assets over time; financial capital can be used to pay for college, put a down payment on a home, or start a business—keys to upward economic mobility. Moreover, an individual's stock of wealth cushions economic costs associated with being laid off, medical expenses and divorce, and can be passed on to future generations in the form of inter-vivos transfers and bequests (see Keister 2000). Several studies have found evidence of substantial racial/ethnic disparities in wealth (Campbell and Kaufman 2006; Conley 1999; Oliver and Shapiro 1995; Smith 1995). While previous research documents inequalities in wealth at a particular point in time, it remains unclear how wealth *trajectories* (i.e., rates of intra-individual changes in wealth with age) vary by race/ethnicity. At what age do racial/ethnic disparities in wealth emerge? Does the wealth gap decrease, remain stable or increase with age? The primary aim of this study is to investigate how wealth trajectories differ among Whites, Blacks and Hispanics. In addition, we know that wealth accumulation is shaped by the interaction of various forms of

life course capital (e.g., human, economic, and social capital) over time (Keister 2000; O'Rand 2001). However, previous research has not examined how these forms of capital may mediate racial/ethnic differences in wealth trajectories. Importantly, minorities are disadvantaged relative to Whites on an array of factors including social origins, SES, financial transfers, family circumstances, and neighborhood context—key determinants of wealth (Conley 1999); thus, Blacks and Hispanics are likely to accumulate wealth at a much slower rate than Whites.

This study utilizes data from the National Longitudinal Survey of Youth (NLSY) to extend previous research on racial/ethnic differences in wealth accumulation. First, the process of wealth accumulation is conceptualized and measured as a trajectory. The majority of previous studies have used cross-sectional data (Land and Russell 1996); the few existing longitudinal studies have explored changes in wealth over relatively short periods of time (Altonji and Doraszelski 2005; Gittleman and Wolff 2004). This study uses panel data and growth curve models to determine the magnitude of racial/ethnic disparities in wealth intercepts (initial levels of wealth at age 21) and slopes (rates of change in wealth between 21 and 45). Second, Whites, Blacks and Hispanics are included in the study. Although Hispanics comprise a large and growing proportion of the population, few studies have investigated their wealth patterns. Third, I examine the extent to which racial/ethnic differences in life course capital explain racial/ethnic inequalities in wealth trajectories. Both the Black-White and Hispanic-White wealth gaps are hypothesized to increase between early adulthood and midlife, consistent with the cumulative advantage/disadvantage hypothesis that intra-cohort inequality rises with age (Dannefer 1987; 2003; O'Rand 1996). Accounting for racial/ethnic

differences in life course capital, specifically, social origins, SES, financial transfers, family circumstances, and neighborhood context, is expected to reduce wealth gaps.

Background

Race/Ethnicity and Inequality

A number of studies have documented considerable racial/ethnic disparities in wealth (Conley 1999; Oliver and Shapiro 1995; Smith 1995), which are much larger than income inequalities (Blau and Graham 1990; Menchik and Jianakoplos 1997). The most common and comprehensive measure of wealth in the literature is *net worth*, which is calculated as the value of all assets less any debts. Kochhar (2004) found that the median wealth of White households is approximately $89,000, compared to only $9,000 among Hispanics, and only $6,000 among Blacks. Additionally, 13 percent of White households have zero or negative wealth whereas Hispanic and Black households have much higher rates,26 and 32 percent, respectively. Home equity represents a major portion of net worth for most households (Keister, 2000); 74 percent of Whites own their homes, compared to less than half of Hispanics and Blacks (Kochhar 2004). Moreover, among homeowners, the average home equity value for Whites is more than twice that of Blacks (Angel and Angel 1996). Thus, racial/ethnic differences in home ownership and equity contribute substantially to disparities in the distribution of net worth (Quadagno and Reid 1996).

Minorities are also disadvantaged in terms of *net financial assets*, which exclude real estate and vehicle equity, and thus, consist of liquid assets that can be readily converted into cash for immediate household consumption. Minority-White gaps in net financial assets are even greater than net worth gaps (Oliver and Shapiro 1995): the mean net financial assets of Hispanics and Blacks are less than a fifth of Whites (Smith 1995). Compared to Whites, racial/ethnic minorities are much less likely to have any cash savings or own stocks or bonds

(Kochhar 2004). Collectively, these findings suggest that Blacks and Hispanics have meager levels of wealth relative to their White counterparts, and that a substantial proportion of minorities do not have the financial wherewithal to meet unexpected economic setbacks such as being laid off from a job or a trip to the hospital.

Race/Ethnicity and Wealth Trajectories

Relatively little is known about how race/ethnicity is related to intra-individual wealth trajectories. Economic research on how savings, consumption and wealth accumulation varies across life stages has been heavily influence by the *life-cycle hypothesis* (Modigliani and Brumberg 1954; Modigliani 1986). According to the life-cycle hypothesis, rational actors, with uncertainty about their life expectancy, should accumulate wealth until they retire at which point they begin dissaving. Thus, the life-cycle hypothesis predicts that median wealth levels rise up until the modal retirement age and decline thereafter. Land and Russell (1996) use a cross-sectional sample of respondents ranging from early adulthood to late-life to examine how well the life-cycle hypothesis predicts the age-wealth profiles. They show that 1) the life-cycle hypothesis is consistent with the age-median-wealth profiles for Whites, but not Blacks or Hispanics, 2) wealth peaks at earlier ages for minorities, and 3) the minority-White wealth gap widens with age.

The latter finding is most relevant to this study, as the focus of the present study is not rooted in life-cycle economics, but rather in a sociological life course examination of how race/ethnicity is related to changes in wealth as individuals age. It is important to note that previous research that has used cross-sectional data to document widening wealth inequality with age is limited by the potential confounding of age changes and cohort differences.

Accordingly, Land and Russell (1996) recommend the use of longitudinal data for detecting sub-population difference in age-wealth patterns.

Several studies have used longitudinal designs to assess race difference in changes in wealth between two points in time. While one of the studies found no Black-White differences in wealth accumulation (Hurst, Luoh, and Stafford 1998), Gittleman and Wolff (2004) found that, over a 10-year period, Blacks experienced less wealth growth than Whites (6% compared to 35%), which is consistent with descriptive statistics showing that, over a 13-year period, the Black-White ratio of median wealth declined (Keister 2004; see also Altonji and Doraszelski 2005). Unfortunately, most of these studies excluded Hispanics and individuals with non-positive baseline values of wealth, a sizable proportion of the population. Moreover, these studies only included respondents that were re-interviewed at a second time-point. Importantly, sample attrition due to mortality and loss-to-follow-up is related to wealth, and thus, studies that do not account for differential attrition rates are likely to yield biased estimates. Inattention to nonrandom attrition may underestimate racial/ethnic gaps in wealth growth/decline.

Another limitation of the research to date that assesses racial/ethnic differences in wealth accumulation involves the practice of simply examining changes in wealth between two points in time to infer differences in wealth accumulation processes. Wealth measures on numerous occasions across the life course are necessary to more fully understand how the *process* of wealth accumulation varies by race/ethnicity. Moreover, previous longitudinal research has typically examined disparities in rates of change over time (i.e., by data waves) rather than age, which is less than ideal from a life course standpoint, given strong reasons to believe that wealth accumulation rates are closely linked to age (Land and Russell 1996). In

sum, although some research has attempted to address these issues, empirical evidence for the growth of wealth inequality with age has been limited by methodological flaws and the scarcity of longitudinal data sources with high quality wealth data. In contrast, the present study uses age-based growth curve models and includes respondents regardless of their attrition status, to determine whether racial/ethnic disparities in wealth are persistent, attenuating or increasing with age.

I hypothesize that racial/ethnic disparities in wealth will increase with age. This hypothesis is consistent with previous research (e.g., Land and Russell 1996; Gittleman and Wolff, 2004), and with the divergence hypothesis that intra-cohort inequality increases with age as the disadvantages associated with minority status accumulate (Dannefer 1987; 2003). In addition, it is consistent with findings that minority-owned houses experience lower rates of appreciation (Blau and Duncan 1990; Flippen 2004), and the fact that wealth produces wealth. Interest and dividends from asset appreciation can be reinvested, facilitating further wealth growth; also, assets can be leveraged to generate more wealth (e.g., using wealth as collateral for additional investments; Keister 2000). Additional reasons to suspect that racial/ethnic disparities in wealth are likely to increase with age are discussed below.

The Role of Life Course Factors in Explaining Racial/Ethnic Stratification in Wealth

Racial/ethnic differences in a wide array of life course factors (e.g., childhood SES, adult SES, work and family patterns, incarceration, financial transfers, and health) are hypothesized as a major source of disparities in wealth trajectories. Controlling for these factors is expected to narrow the minority-White wealth trajectory gap as the sample ages. Previous research has shown that adult SES explains a portion of the Black-White gap in wealth levels (Land and Russell 1996). Minority disadvantages in childhood SES and family

structure contribute to racial/ethnic disparities in adult wealth levels (Keister 2004). On the other hand, Oliver and Shapiro (1999) reported that after controlling for a range of human capital and status attainment variables, more than 70% of the race gap in wealth levels persists, which points to the importance of unobserved factors such as discrimination (see Darity 2005).

Relatively few longitudinal studies have examined factors contributing to racial/ethnic differences in prospective wealth growth. One such study reported that after accounting for racial differences in income and inheritances, Blacks and Whites exhibited comparable wealth appreciation over a 10-year period (Gittleman and Wolff 2004). Overall, evidence suggests that accounting for racial disparities in a wide array of life course factors is likely to mediate racial/ethnic differences in wealth trajectories.

According to cumulative disadvantage theory, racial/ethnic inequalities in stocks of life course capital (e.g., family, human, social, economic and health capital) increase over the life course (O'Rand 2001) and are likely to contribute to racial/ethnic differences in wealth accumulation. The notion of life course capital is a parsimonious heuristic for conceptualizing how various 'stocks' of resources are interrelated and dynamic over the life course (O'Rand 2001). From a life course perspective on status attainment, it is important to consider a wide array of factors that may influence racial/ethnic disparities in wealth accumulation. For example, aspects of social origins affect adult SES and likely shape racial disparities in wealth (Keister 2004; Land and Russell 1996). Disadvantages in childhood SES negatively influence attainment processes (e.g., education), and are associated with lower adulthood SES (Blau and Duncan 1967; Corcoran 1995; Teachman 1987). Similarly, sibship size (number of siblings) has deleterious effects on educational attainment and income

(McLanahan 1985; Sandefur and Wells 1999) because additional siblings dilute family resources (Downey 1995). Education is a primary source of human capital that is consistently found to have a strong impact on individuals' occupations and ultimately their earnings. Moreover, the strength of the educational-income relationship increases with age (Crystal, Shea, and Krishnaswami 1992).

Labor markets are highly segmented along the lines of race/ethnicity. Black and Hispanic people remain overrepresented in lower-paying jobs and underrepresented in higher-paying jobs (Queneau 2005); also, minorities have experienced higher unemployment rates than Whites over the past half century (Fairlie and Sundstrom 1999; U.S. Census 1999). Further, Black and Hispanic households have higher poverty rates (U.S. Census 2000) and lower average household incomes than whites (Moon and Juster 1995).

Racial/ethnic occupational segregation and disparities in unemployment rates and earnings are, in part, a result of racial/ethnic differences in human capital (Grodsky and Pager 2001; Oliver and Shapiro 1995). Yet, an earnings gap remains even after accounting for typical human capital measures, which has led some to speculate that differentials in residual earnings are due to a failure to fully capture racial differences in skills and cognitive ability (Farkas and Vicknair 1996; Neal and Johnson 1996). However, this hypothesis is refuted by a study by Raudenbush and Kasim (1998) showing that race differences in earnings persist after including robust controls for background, skills, and cognitive ability. Together, these findings suggest that discrimination may continue to play a role in wage disparities (see Darity and Mason 1998).

Segregation also plays a role in creating labor market inequality. Though declining recently, a high degree of residential segregation along race/ethnicity persists in the U.S.

(Glaeser and Vigdor 2001). The *spatial-mismatch hypothesis* posits that employment decentralization in tandem with residential segregation leads to racial/ethnic disparities in job opportunities (Carrington and Troske 1998; Kain 1968; Mouw 2000; Wilson 1987). Also, Mouw (2002) found that segregated job networks are just as important as residential segregation in creating racial inequality in the labor market.

Racial/ethnic disparities in earnings are a proximate source of the racial/ethnic wealth gap (Blau and Graham 1990), because (a) wealth accumulation rises with income level (Smith 1995), and (b) minorities have lower incomes (Moon and Juster 1995; U.S. Census 2004). Minorities must commit a greater share of their income to essential consumables (e.g., housing, vehicles, food and clothing), owing to their lower incomes. Consequently, minorities have less discretionary income to commit to savings and investments (Oliver and Shapiro 1995).

Family patterns vary by race/ethnicity and may also contribute to wealth disparities. Marriage entails a number of economic benefits including 1) the marriage premium on wages, 2) economies of scale, and 3) specialization among spouses in production (Becker 1981). As a result, married couples have much higher per capita levels of wealth than those who are widowed, divorced, separated, or never married (Waite 1995; Wilmoth and Koso 2002). Compared to Whites, Blacks and Hispanics have lower rates of marriage and higher rates of marital dissolution (Angel et al. 2003; Cherlin 1992). However, even among married couples, there are large racial/ethnic inequalities in wealth (Oliver and Shapiro 1995). Also, though some have argued that children are likely to depress wealth accumulation (Modigliani 1986), others have found no net effect of number of children on wealth (Lupton and Smith 1999).

In addition, the minority-White wealth gap is related to racial/ethnic differences in the receipt of inheritances (Smith 1995; Wilhelm 2001). Blacks and Hispanics are less likely than Whites to receive inheritances. Moreover, among inheritance recipients, minorities receive smaller inheritances. Financial inheritances account for approximately 10% to 20% of the minority-White disparity in wealth levels (Menchik and Jianakoplos 1997), yet it is unclear what role inheritances play in racial/ethnic inequalities in wealth trajectories.

Data and Methods

Sample

This study uses panel data from the National Longitudinal Study of Youth 1979 cohort (NLSY), which is funded by the Bureau of Labor Statistics. I utilize the NLSY core sample that is representative of the non-institutionalized civilian population aged 14 to 21 on December 31st 1978 (i.e. the 1957 to 1964 birth cohort) who reside in U.S. households (respondents were followed in the event of prospective institutionalization). Spouses of respondents were interviewed regardless of age-eligibility. The total analytic sample includes 5,934 respondents (4,765 Whites, 732 Blacks, and 437 Hispanics).

Though the NLSY began in 1979, information on wealth was not collected until 1985. This study employs 11 waves of data on wealth, collected between 1985 and 2004. This time span enables an analysis of wealth trajectories from the ages of 21 to 45. In addition, this study uses background information collected at baseline. Several features of the NLSY make it especially appropriate for this study. First, due to the wide range of ages covered in the NLSY, it is possible to study the effect of race/ethnicity on wealth at numerous life stages to determine whether race/ethnicity has a different impact on wealth accumulation during the twenties, the thirties and forties. Second, the NLSY is well-suited to

examine the extent to which life course factors mediate racial/ethnic differences in wealth trajectories, owing to detailed information on wealth as well as social origins, adult SES, work and family histories, and neighborhood contexts.

No study is without limitations. On the NLSY, exceptionally high values of assets are top-coded. However, this affects relatively few respondents. Also, the NLSY has few respondents with extremely high levels of wealth. Truncation and the limited number of individuals at the upper end of the wealth distribution may downwardly bias wealth estimates (Zagorsky 1999), and lead to conservative estimates of racial/ethnic inequalities in wealth. Alternative datasets with wealth information are limited as well. For example, the Survey of Consumer Finances (SCF) oversamples very wealthy households and has high quality wealth data (Wolff, 1995), but it is not appropriate for investigating intra-individual wealth change because it is a cross-sectional survey. Zagorsky (1999) has evaluated the quality of the wealth data in the NLSY, compared it to that of the SCF and the Panel Study of Income Dynamics (PSID), and showed that it is similar to these surveys. Further, Keister and Moller (2000) found that wealth estimates of the NLSY are consistent with those of other surveys. I chose to use the NLSY because it is longitudinal, has low rates of attrition, and, compared to the PSID, NLSY data provides more detailed asset and debt information, it has more waves of wealth data, and it has shorter time intervals between waves with wealth information—characteristics that make it ideal for estimating age-based wealth trajectories.

Wealth Measures

This study uses two measures of wealth. *Net worth*. Household net worth is the sum of net housing value (primary residence value minus the mortgage), real assets (other real estate, vehicles, and business equity), and financial assets (checking, savings and money

market accounts, IRAs, stocks, trusts, 401ks, mutual funds, insurance policies, tax-deferred accounts, investment trusts, and bonds) minus debts (both secured and unsecured). Pension wealth was not collected. *Net financial assets* (NFAs). This measure is the sum of household financial assets less debt. For comparability across data waves, wealth measures were converted to 2004 dollars using the Consumer Price Index (CPI). Additionally, since both wealth variables are household-level measures, they include the assets and liabilities for both spouses in the case of marriage and both partners in the case of cohabitation. Also, because the distributions of both wealth measures are skewed, the natural logarithm of their value is used in the analysis.

Demographic Variables

Three dummy variables index *race/ethnicity:* non-Hispanic white (ref.), non-Hispanic Black, and Hispanic. *Gender* is measured by a dummy variable (1=female; 0=male). *Age* is measured in years and represents the linear growth term as discussed below.

Social Origins

Social origins, or childhood SES, are measured by several variables. *Parental education* measures the average educational attainment (in years) of the respondent's mother and father (in cases where educational information is missing for one parent, the other parent's is used). *Family income* in 1978 is used as an indicator or the respondent's family's economic resources (family wealth is not available). Also, a measure of the respondent's *number of siblings* is included as previous research has shown that siblings dilute family economic resources and influence wealth accumulation (Keister 2003).

Adult Human Capital and Socioeconomic Status

This study includes an array of human capital and adult SES indicators. *Educational attainment*, a key determinant of social mobility, is measured in years. The *number of weeks worked* in the previous calendar year is also included as a proxy for labor force participation and attachment. The *household earnings* measure includes wages, salaries, commissions, and tips from all jobs in the previous year; this variable is logged to reduce the positive skewness. A summary measure of logged *financial transfers* indicates the total value of property and money from estates, trusts, inheritances, and gifts from relatives and friends between 1985 and 2004.

Family Context and Community Conditions

Measures of adult family circumstances include *marital status* (1= married; 0=not married) and *number of children in the household*. Models also account for the *unemployment rate* of the local labor market, whether the respondent's residence is *urban* (1=urban; 0=rural) and the *region* the respondent resides in (e.g. Northeast (ref.), Midwest, South, West). All independent variables are time-varying except for the measures of social origins, race, gender, and financial transfers. The selection of the independent variables to be included were guided by status attainment theory and previous research on racial differences in wealth accumulation (e.g., Conley 1999; Keister 2003; Land and Russell 1996; Oliver and Shapiro 1995).

Because variable x must precede variable y in order to establish that x causes y, one could argue that the independent variables should be lagged such that the dependent variable at wave t is predicted by the covariates at wave t-1. However, the focus of this study is not on establishing a causal relationship between the time-varying covariates and wealth, but rather

on describing the extent to which racial/ethnic differences in life course factors mediate racial/ethnic inequalities in wealth trajectories. For this reason and the fact that lagging the independent variables reduces the sample size by more than 12%, the independent and dependent variables are modeled concurrently. Sensitivity analyses (not shown) reveal that findings from this study are robust after lagging the covariates.

Given that this study draws on wealth data from 11 different years between 1985 and 2004 and the fact that fluctuations in the business cycle occur, the wealth of the respondents may be somewhat higher (or lower) during particular years. This raises the possibility that estimates of the relationship between race/ethnicity and wealth may be an artifact of period effects. While supplemental analyses with dummy indicators of survey years revealed that wealth did vary across waves (net of age), the findings of this study are robust to period effects. For the sake of parsimony, controls for survey year are excluded from the models (including such controls for survey year led to an additional 20 degrees of freedom).

Analytic Strategy

Life course theory and the life cycle hypothesis posit age as the appropriate metric in the study of wealth accumulation. However, the NLSY is organized by wave, not by age. Due to considerable age heterogeneity within each wave of the NLSY (age range of 7), it was necessary to reorganize the data from wave to age in order to accurately test the hypotheses. This transformation is referred to as an accelerated longitudinal design, which is commonly used in developmental, survey research (see Herd 2007; Yang 2007). Supplemental analyses showed no evidence of cohort differences, owing most likely to the relatively narrow cohort range (1957-64).

To investigate racial/ethnic differences in wealth trajectories between the ages of 21 and 45, individual growth curves were modeled within a mixed model (i.e., hierarchical linear model) framework, which is an integrated approach for studying the structure and predictors of individual growth. These models are well-suited for panel data where individuals are repeatedly interviewed, and for the assessment of individual change with age (Raudenbush and Byrk 2002). A hierarchical strategy is used, where repeated observations (Level 1) are nested within respondents (Level 2). Other methods, such as Latent Trajectory Models (LTMs) are also appropriate for analyzing wealth trajectories. However, multilevel growth curve models, unlike LTMs, are particularly well-suited to handle unbalanced time structure data (Singer and Willett, 2003), as is the case for accelerated longitudinal designs.

The growth curve models generate individual trajectories that are based on estimates of person-specific intercepts (initial value) and slopes (rate of change) that describe intra-individual patterns of change in wealth as a function of age. Comparisons of nested likelihood ratio tests (LRTs) of various shapes of wealth trajectories (e.g. linear, quadratic or cubic models), suggested that a linear growth curve with random intercepts and random linear age slopes provided the best fit to the data. After developing an accurate model of the unconditional trajectory, independent variables are added to the model in order to examine the extent to which they explain racial/ethnic disparities in wealth accumulation. To estimate the effects of the covariates on the trajectory slope, interactions between the independent variables and age are included. Covariates are mean-centered to facilitate model interpretation. If independent variables are not mean-centered, the fixed effects of age denote the trajectory shape for respondents with values of zero on all covariates; however, when independent variables are mean-centered, the fixed effects of age represent the mean

trajectory shape for individuals with average values on the continuous measures and zero values on the dummy variables, which is more substantively interesting (Singer and Willett 2003).

Over the survey period, respondents contributed between 1 and 11 observations (or person-years). Response rates varied across racial/ethnic groups, with Whites, Blacks and Hispanics contributing an average of 8.4, 8.2, and 7.9 observations, respectively. Importantly, in the presences of differential attrition rates, conventional methods that employ complete case analysis methods such as listwise and pairwise deletion or arbitrary rules regarding the number of observations needed to be included in the analytic sample, as is the case in most previous studies of wealth changes (e.g., Zagorsky 2005; Keister 2004; Gittleman and Wolff 2004), are likely to yield biased estimates.

To avoid such biases, this study utilizes hierarchical linear models in tandem with maximum likelihood estimation, which has the advantage of being able to incorporate all respondents who have been observed at least once including those who die (or attrit for other reasons) during the observation period in the sample, and is consistent with the approaches of recent high-quality studies on disparities in health trajectories (see Herd 2007; Taylor 2008; Yang, 2007). Under these circumstances, Raudenbush and Bryk (2002) note that 1) the data may be assumed to be missing at random (MAR), meaning that the probability of missing a time point is independent of missing data given the observed data, and 2) this is a reasonable assumption when the observed data include variables related to both missingness and the dependent variable. Assuming the data are MAR, because all of the data are used in the analysis and a fully efficient estimation procedure (maximum likelihood) is utilized, estimates from the growth curve models are asymptotically unbiased (Raudenbush and Bryk

2002).

Furthermore, to account for racial/ethnic differences in attrition, an indicator of the number of waves contributed is included in the models. Supplemental analyses showed that results were robust to the inclusion of a dummy indicator of prospective mortality, as well the exclusion of those who attrited. Neither of these adjustments resulted in appreciable changes in the size or significance of the race/ethnicity effects, therefore, they are not presented.

Since the dependent variable (net worth) is logged, the relative effect for dichotomous independent variables is revealed by subtracting one from the coefficient antilog; coefficients for continuous covariates indicate the relative change in wealth for a one unit increase in the covariate. The percentage change in wealth is revealed by multiplying the relative change coefficient by one-hundred (Hardy 1993: 57). For example, a coefficient value of .25 for a continuous measure suggests that a 1 unit increase in the independent variable is predictive of a 25% (.25 ×100 = 25) increase in wealth.

Results

Table 2.2 presents growth curve model estimates of racial/ethnic differences in net worth trajectories between early adulthood and midlife. Overall, findings in Table 2.2 show that the there are substantial wealth gaps between racial/ethnic groups and that these disparities increase with age, consistent with the cumulative disadvantage hypothesis. More specifically, results in Model 1 indicate that, compared to Whites, Blacks and Hispanics have significantly lower wealth intercepts (i.e., wealth levels at age 21). In addition, Whites experience more rapid wealth accumulation than their minority counterparts: whereas the net worth of Whites increases at a rate of 19.8% (100 × .198) per year, the corresponding rates among Blacks and Hispanics are 9.1% (19.8% - 10.7%) and 14.7% (19.8% - 5.1%) ,

respectively. Though these differences in rates of change do not appear to be all that large, it is important to consider that racial/ethnic inequalities in rates of wealth accumulation are compounded over time. Further, racial/ethnic groups have very different levels of wealth. Therefore, even in the event that Whites, Blacks, and Hispanics had similar *rates* of wealth accumulation, inequalities in wealth *levels* would be magnified with age.

The magnitude of racial/ethnic inequalities in wealth is revealed in Figure 2.1, which shows simulated wealth trajectories by race/ethnicity. These simulations are based on the coefficient estimates in Table 2.2 (to ease interpretation log wealth is converted to real dollars).Whites exhibit substantial wealth growth, especially during their 30s and 40s. On the other hand, Blacks and Hispanics exhibit only slight increases in wealth as they age. By age 45, Whites are projected to have a net worth of $57,860, compared to $3,835 among Hispanics, and merely $470 for Blacks.

Model 2 adds controls for social origins, human capital, adult SES, family context, and community conditions. Controlling for minorities' disadvantages in life course capital diminishes Black-White and Hispanic-White gaps in wealth intercepts, though they are not eliminated. Similarly, although the inclusion of the controls does not entirely do away with Black-White disparities in wealth slopes, Blacks' disadvantages in rates of wealth accumulation are reduced from 10.7% to3.8% per year; rates of wealth growth among Hispanics are comparable to those of Whites, net of the controls. Supplemental analyses (not shown) suggest that racial/ethnic differences in social origins were the major contributing factors to the disparities in wealth intercepts, while adult human capital and SES factors bear most responsibility for racial/ethnic inequalities in rates of wealth accumulation. Figure 2.2 shows that, despite controlling for an array of life course factors, wealth inequalities continue

and are magnified with age. This suggests that racial/ethnic differences in savings rates and/or returns on investments may play a major role in generating disparate wealth trajectories (see Altonji, Doraszelski 2005; Gittleman and Wolff 2004).

Growth curve models of financial wealth trajectories are presented in Table 2.3. Consistent with the cumulative disadvantage hypothesis, minorities have less financial wealth than Whites and the gap widens with age. Estimates from Model 1 indicate that Whites have more financial wealth than Blacks and Hispanics at age 21. Moreover, Whites have steeper NFA trajectory slopes: the financial wealth of Whites increases at an annual rate of 19.7%, while the NFAs of Blacks and Hispanics increase by 6.3% (19.7% - 13.4%) and 12.4% (19.7% -7.3%), respectively.

Figure 2.3 shows the size and shape of the NFA trajectories by race/ethnicity. These simulations are based on the coefficient estimates in Model 1 of Table 2.3. Whites' trajectories are characterized by a low intercept followed by a steep increase in NFAs as they age. Conversely, the NFA trajectories of Blacks and Hispanics are characterized by very low intercepts and relatively flat slopes. At age 45, Whites are predicted to have $5,732 in financial wealth, compared to only $65 and $335 among Blacks and Hispanics, respectively.

Model 2 of Table 2.3 includes control measures. Interestingly, after controlling for racial/ethnic differences in life course capital, NFA intercepts are similar for Whites, Blacks and Hispanics (the coefficients for Blacks and Hispanics are negative but are not statistically significant). Ancillary analyses (not shown) suggest that social origins were particularly important for mediating the disparities in NFA intercepts. In Model 2, Hispanics and Whites have similar NFA trajectory slopes, while Blacks continue to accumulate NFA at a slower rate. Simulations of NFA trajectories by race/ethnicity, net of controls, are presented in

Figure 2.4. These simulations are based on the coefficient estimates in Model 2 of Table 2.3. Figure 2.4 shows that, by age 45, Blacks have amassed considerably less than Whites ($5102 vs. $19965); although Hispanics appear to have steeper NFA trajectories than Whites, formal tests indicate that there are no statistically significant differences in their NFA intercepts or slopes.

Discussion

A small but growing body of research has documented racial/ethnic disparities in levels of wealth. However, less is known about how the process of wealth accumulation across the life course varies by race/ethnicity. This study is the first to both conceptualize and measure the wealth trajectories of Whites, Blacks, and Hispanics. Longitudinal data and a life course perspective are employed to investigate racial/ethnic inequalities in intra-individual changes in wealth.

Findings provide support for my hypotheses and reveal dramatic racial/ethnic differences in wealth trajectories. Whites have modest amounts of wealth in early adulthood, but experience rapid wealth growth during their 30s and 40s. This contrasts with scenarios among Blacks and Hispanics where they have trivial amounts of net worth in early adulthood that only slightly increase with age. On the whole, results are consistent with the cumulative disadvantage hypothesis. That is, relatively small wealth gaps between Whites, Blacks and Hispanics exist in their early 20s, but these initial inequalities are magnified with age, resulting in enormous wealth gaps by midlife. By age 45, Whites amass an average net worth of $57,860, whereas Hispanics and Blacks have only $3,835 and $ 470, respectively. A similar picture emerges with respect to net financial assets, whereby minorities' early

disadvantages relative to Whites are accentuated over time, resulting in vast racial/ethnic inequalities in liquid assets in midlife.

This study utilizes a status attainment framework to explain racial/ethnic differences in wealth trajectories. Findings suggest that this framework has considerable utility for understanding wealth accumulation processes, and to a lesser extent, racial/ethnic disparities in wealth growth. An array of factors is shown to predict wealth accumulation including social origins, human capital, SES, financial transfers, family circumstances, and neighborhood context. Because Blacks and Hispanics are disadvantaged, compared to Whites, in these forms of life course capital, controlling for such factors was hypothesized to account for racial/ethnic disparities in wealth trajectories. Overall, we find mixed support for this hypothesis: controlling for levels of life course capital reduces racial/ethnic differences in levels of wealth and rates of wealth growth; however, large wealth gaps remain. That there are substantial residual racial/ethnic wealth disparities after controlling for family background, human capital, income, inheritances, marriage and other factors, could be the result of a number of unobserved factors discussed below.

Differences in savings rates may play a role in disparities in wealth levels and growth. Altonji and Doraszelski (2005) argue that minorities may commit less of their income to savings than Whites, citing a study showing that a 25-30% of minorities are "unbanked" (Hogarth and O'Donnell 1999), which means that that they do not have accounts at depository institutions (e.g., banks, credit unions, and thrifts). The proposition that racial/ethnic wealth inequalities are due, in part, to especially low savings rates among minorities is plausible given that individuals mimic the savings behaviors of their parents even after accounting for the income, wealth, and risk propensities of parents and children

(Charles and Hurst 2003), and that the minority parents of the baby boomers experienced significant barriers to saving. That said, several studies have shown that savings rates among minorities increase as their income increases (Oliver and Shapiro 1995), and that there are no racial/ethnic differences in savings rates after controlling for income (Conley 1999; Gittleman and Wolff 2004).

Racial/ethnic inequalities in rates of return on investments are likely to lead to disparities in wealth trajectories. Related to this are racial/ethnic differences in wealth composition. Whereas a majority of the wealth of Blacks is invested in functional assets (e.g., homes or vehicles) rather than financial assets, just the opposite is true among Whites (Oliver and Shapiro 1995; Terrell 1971). For example, stocks represent only 1% of Blacks' wealth, compared to 9% among Whites. Though financial assets such as stocks are more risky than conservative investments like housing, they tend to increase in value more rapidly, yielding better long-term rates of return. Blacks and Hispanics are also at a disadvantage in that their real assets such as housing appreciate at lower rates (Flippen 2004). Racial/ethnic differences in returns on investments are likely a major source of the growing wealth gaps documented in the study.

Discriminatory practices, such as redlining and predatory lenders targeting minorities, are likely to inhibit wealth accumulation in minority communities and contribute to the wealth gap. Sub-prime mortgages have exceptionally high interest rates in order to offset the higher risks of lending to borrowers with weak credit histories and/or high debt-to-income ratios. Features of sub-prime mortgages such as pre-payment penalties and balloon payments increase the likelihood of foreclosure. Importantly, Blacks and Hispanics are more likely than Whites to receive high-cost mortgages, even after controlling for factors such as the amount

of the loan, the borrower's income (Avery, Brevoort, and Canner 2006), and credit history (National Community Reinvestment Coalition, 2003). Audit studies of discrimination in housing markets reveal that Blacks and Hispanics are discriminated against 16% and 20% of the time, respectively, when looking to buy a house (Turner et al. 2003). Favreault (2007) argues that while the probability of experiencing discrimination in any given transaction is somewhat modest, when such odds are applied to the number of significant economic transactions over the course of one's life, the cumulative effects of discrimination are likely to be sizeable and affect economic mobility.

Consistent with the life course principle of linked lives, Altonjii and Doraszelski (2005) argue that racial/ethnic differences in social networks may also influence wealth inequalities. The basic idea behind their premise is that friends and family members of Blacks and Hispanics are likely to be worse off economically than those of Whites, and that in economically depressed communities there may be especially strong norms of social responsibility whereby prosperous individuals are expected help those in need. In this way, the wealth accumulation of relatively high-earners in minority communities is diminished because discretionary income is transferred rather than saved or invested, and thus, contributing to racial/ethnic inequalities in wealth.

Models of wealth trajectories may have omitted factors central to wealth accumulation and the racial/ethnic wealth gap. For example, analyses do not control for the respondents' parental wealth because it was not collected by the NLSY79, which is unfortunate because parental wealth affects one's prospects for intra-generational upward wealth mobility by influencing educational and occupational opportunities as well as access to credit (Evans and Jovanovic 1989; Holtz-Eakin, Joulfaian and Rosen 1994). In addition,

parental wealth may play a critical role in the transmission of racial/ethnic inequalities across generations (Conley 1999). Also, health measures are conspicuously absent from the dataset; given the positive effects of health on wealth (Smith, 1999) in tandem with racial/ethnic disparities in health, it is plausible that health disparities contribute to the wealth gap. Nor are indicators of experiences of discrimination included in the models. That said, this study includes variables common in the literature on racial/ethnic differences in wealth (e.g., human capital, SES, financial transfers, and demographic factors), and is among the first to include measures of such factors at numerous points across the life course. This is critical for understanding mechanisms behind wealth inequalities because the amount of wealth accumulated at a particular point in time is dependent on savings and consumption patterns in previous years, and is therefore influenced not only by current circumstances, but also demographic and SES histories (Altonji, Doaszelski and Segal 2000). With the inclusion of time-varying measures of income, this study comes closer to capturing permanent income—a primary determinant of savings and consumption behavior—than previous studies on racial/ethnic inequalities in wealth.

Analyses presented in this study assume that the indicators of life course capital have similar relationships with wealth for Whites, Blacks, and Hispanics. While previous research suggests that the correlations between income and wealth may be weaker among Blacks than Whites (Altonji and Doraszelski 2005), supplemental analyses did not find evidence of such interactions. A full investigation of racial/ethnic differences in the sensitivity of wealth trajectories to life course factors is beyond the scope of this study. Future research on this topic is needed.

The top-coding of wealth measures in the NLSY represents a limitation of this study. Because the right-hand tail of the wealth distribution is truncated, measurement error is introduced to the models of wealth trajectories. Given that Whites were most likely disproportionately affected, their wealth may be underestimated, likely resulting in conservative estimates of racial/ethnic inequalities in wealth trajectories.

This study is among the first to investigate trajectories of wealth accumulation between early adulthood and midlife. Understanding investment behaviors in early adulthood and midlife is particularly important because assets accumulated during these stages of life often appreciate and compound over time, having significant consequences for financial security in later life. Unfortunately, the available data do not permit the analysis of wealth trajectories into the 50s and beyond. Because longitudinal studies just began collecting high-quality information on assets and liabilities in the 1980s (NLSY in 1985; PSID and SIPP in 1984), data on intra-individual changes in wealth across the entire adult lifespan does not exist. Issues of later-life economic security are increasingly important as the baby boom cohort approaches retirement age. Furthermore, research on the relative well-being of older racial and ethnic minorities is particularly important as the composition of the elderly population is projected to become more diverse over the next half century with dramatic increases in the proportion of older Blacks and Hispanics (U.S. Census 2004). Findings from this study suggest that, by midlife, the average White baby boomer has amassed considerable wealth that will potentially be used as retirement income, whereas Hispanics and Blacks have not. Future research ought to examine racial/ethnic differences in wealth trajectories in later life. The Health and Retirement Study (HRS) would be an ideal source for such a study

because it is a longitudinal, biennial survey with wealth information on individuals over age 50.

Consistent with cumulative disadvantage perspectives on intra-cohort inequality dynamics, this study finds that initial racial/ethnic wealth inequalities increase dramatically with age. While an array of indicators of life course capital were shown to predict wealth accumulation, racial/ethnic inequalities in these factors explained little of the disparities in wealth levels and growth. In addition to racial/ethnic differences in life course capital, Whites' steeper wealth trajectories are likely due to that fact that, compared to Blacks and Hispanics, they have a more assets, higher valued assets, invest a greater percentage of their wealth holdings in high-return investments, and are more likely to invest early in the life course—facilitating rapid wealth growth due to asset appreciation and compounding over time. Future research should investigate differences in trajectories of ownership and value of particular assets (e.g., homes, businesses, stocks, mutual funds, IRAs, and savings accounts), as well as the specific factors that underlie racial/ethnic differences in wealth trajectories over the life course such as permanent income, savings rates, financial literacy and discrimination.

Table 2.1 Weighted Baseline Descriptive Statistics

Variables	Whites	Blacks	Hispanics
Ln Net worth[ab]	6.31	4.24	5.38
Ln Net financial Assets[ab]	4.14	2.45	2.99
Female	50.38	53.92	50.9
Ln Parents' income in 1978[ab]	9.67	9.18	9.17
Parents' education[ab]	11.97	10.68	8.31
Number of siblings[ab]	3.03	4.35	4.38
Years of Education[ab]	12.89	12.25	11.63
# of weeks worked last year[ab]	37.21	29.35	33.53
Ln Earnings[ab]	8.88	7.28	8.05
Ln Sum of financial transfers[ab]	4.07	1.59	1.61
Unmarried[a]	59.07	79.05	64.45
Number of children[ab]	0.45	0.65	0.66
Unemployment rate[a]	3.27	3.09	3.24
Midwest[ab]	32.20	16.20	8.57
West[ab]	17.99	7.68	36.77
South[ab]	30.44	58.66	35.05
Urban residence[ab]	75.96	88.43	98.15
N	4765	732	437

[a] White-Black difference is statistically significant at .05 level

[b] White-Hispanic difference is statistically significant at .05 level

Table 2.2 Net Worth Trajectories between Ages 21-45, Growth Curve Models

		Model 1	Model 2
Fixed Effects			
Initial status $_{0i}\pi$	Intercept	6.205***	6.773***
	Black	-2.253***	-1.187***
	Hispanic	-1.492***	-0.643*
	Female	-0.401**	-0.392**
	Parents' income in 1978		0.458***
	Parents' education		0.081**
	Number of siblings		-0.124***
	Years of Education		-0.147***
	# of weeks worked last year		0.007*
	Earnings (logged)		0.131***
	Financial transfers (logged)		0.062***
	Unmarried		-1.70***
	Number of children		-0.136*
	Unemployment rate		0.087
	Midwest		0.132
	West		0.243
	South		0.310+
	Urban residence		-0.007
Rate of linear change, π	Intercept	0.198***	0.197***
	Black	-0.107***	-0.038*
	Hispanic	-0.051**	0.008
	Female	0.014	0.021*
	Parents' income in 1978		-0.007
	Parents' education		0.003
	Number of siblings		0.004
	Years of Education		0.023***
	# of weeks worked last year		0.002+
	Earnings (logged)		0.004*
	Financial transfers (logged)		0.001
	Unmarried		-0.014
	Number of children		0.009+
	Unemployment rate		-0.011*
	Midwest		0.002
	West		-0.026+
	South		-0.039**
	Urban residence		-0.012
Random Effects			
	Level 1 Residual	4.912***	4.892***
	Level 2 Intercept	3.368***	2.994***
	Level 2 Age	0.150***	0.074***
	N	5934	5718
	Log Likelihood	-152798	-138795

+p <.1; *p<.05; **p<.01; ***p<.001

Figure 2.1 Net Worth Trajectories between Ages 21 and 45 (Model 1)

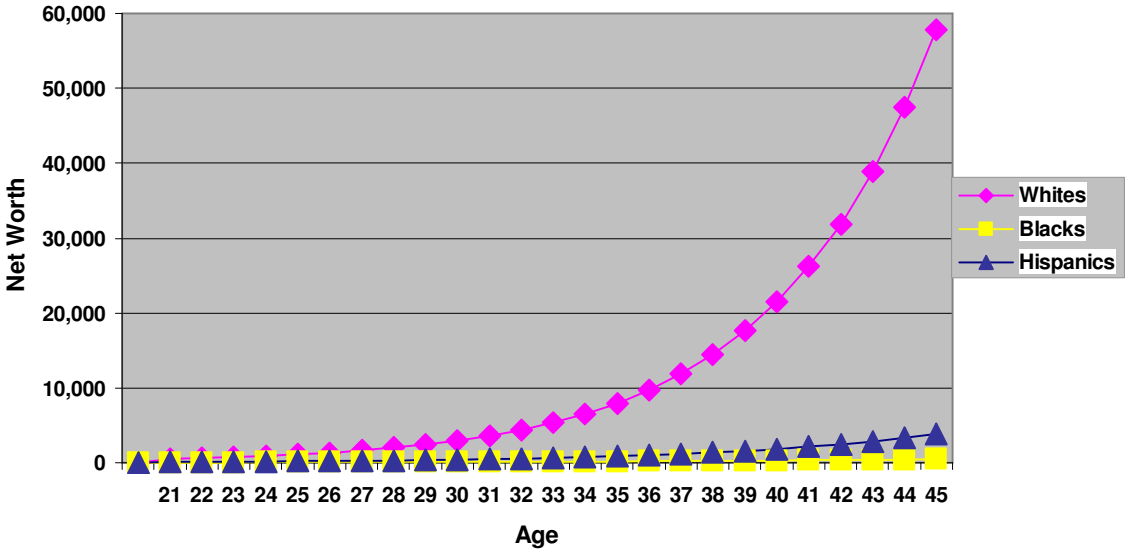


Figure 2.2 Net Worth Trajectories between Ages 21 and 45 (Model 2)

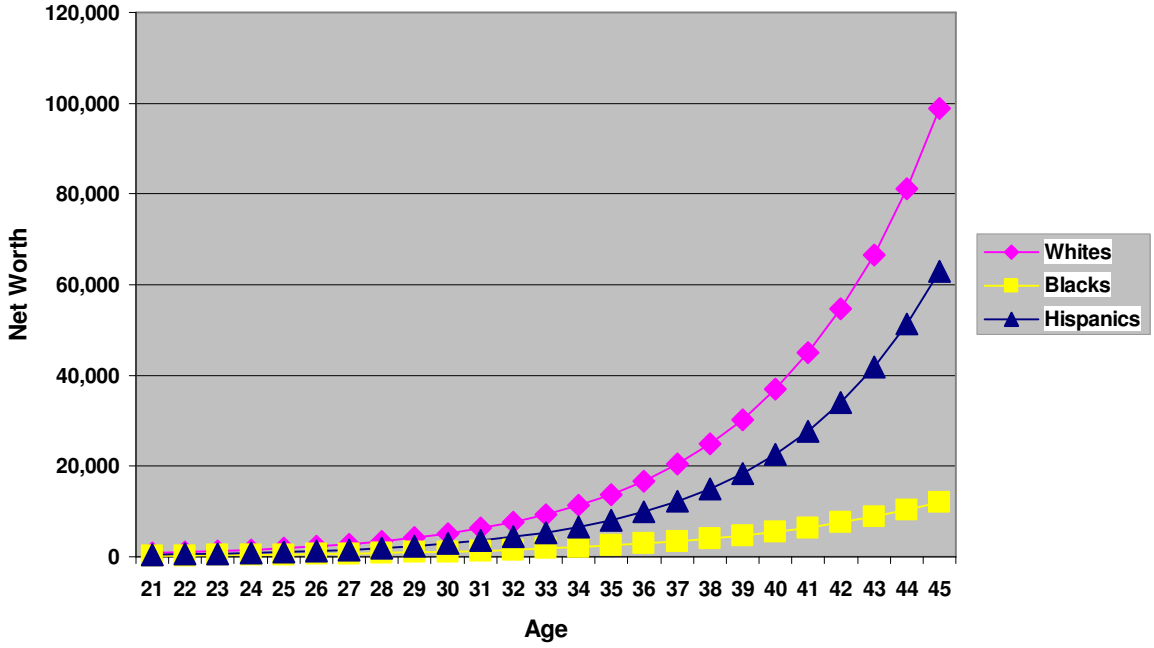


Table 2.3 Net Financial Assets Trajectories between Ages 21-45; Growth Curve Models

		Model 1	Model 2
Fixed Effects			
Initial status, π_{0i}	Intercept	3.948***	4.040***
	Black	-1.255***	-0.329
	Hispanic	-1.130***	-0.192
	Female	-0.256+	-0.101
	Parents' income in 1978		0.471***
	Parents' education		0.116***
	Number of siblings		-0.084*
	Years of Education		-0.071*
	# of weeks worked last year		0.004
	Earnings (logged)		0.059+
	Financial transfers (logged)		0.077***
	Unmarried		-1.093***
	Number of children		-0.380***
	Unemployment rate		0.094
	Midwest		-0.304
	West		-0.410+
	South		0.038
	Urban residence		0.456**
Rate of linear change, π_{1i}	Intercept	0.197***	0.234***
	Black	-0.134***	-0.041*
	Hispanic	-0.073***	0.024
	Female	-0.010	-0.009
	Parents' income in 1978		0.001
	Parents' education		0.003
	Number of siblings		0.001
	Years of Education		0.026***
	# of weeks worked last year		0.001+
	Earnings (logged)		0.010***
	Financial transfers (logged)		0.001
	Unmarried		-0.048***
	Number of children		0.011*
	Unemployment rate		-0.015**
	Midwest		-0.027*
	West		0.007
	South		-0.020
	Urban residence		-0.057***
Random Effects			
	Level 1 Residual	5.315***	5.330***
	Level 2 Intercept	3.616***	3.256***
	Level 2 Age	0.192***	0.121***
	N	5955	5736
	Log Likelihood	-164155	-148995

+p <.1; *p<.05; **p<.01; ***p<.001

Figure 2.3 Net Financial Asset Trajectories between Ages 21 and 45 (Model 1)

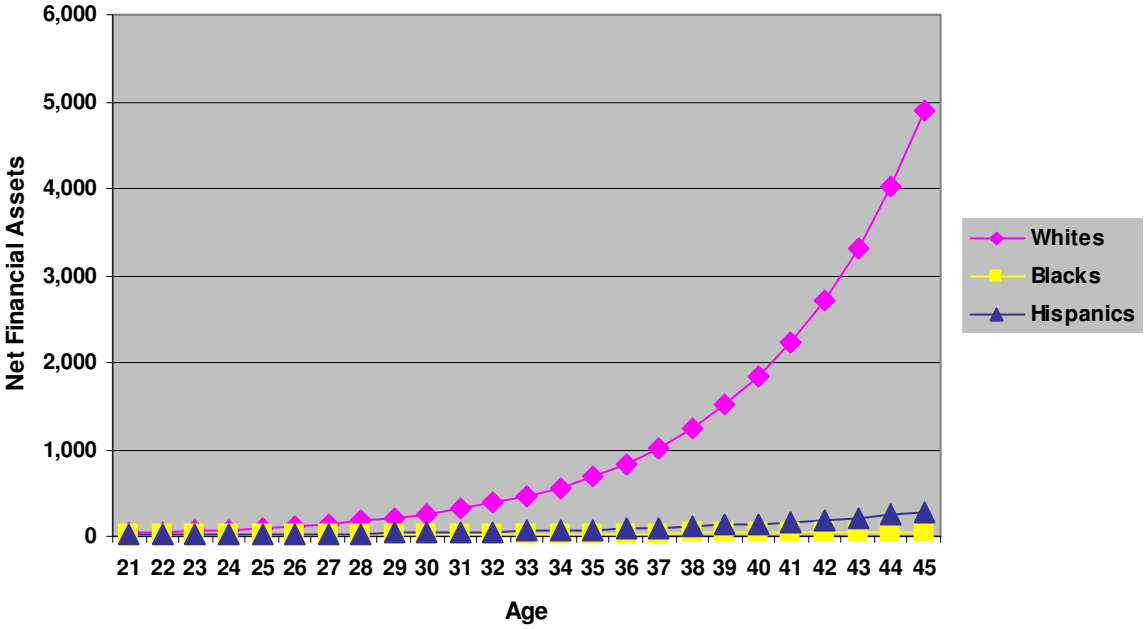
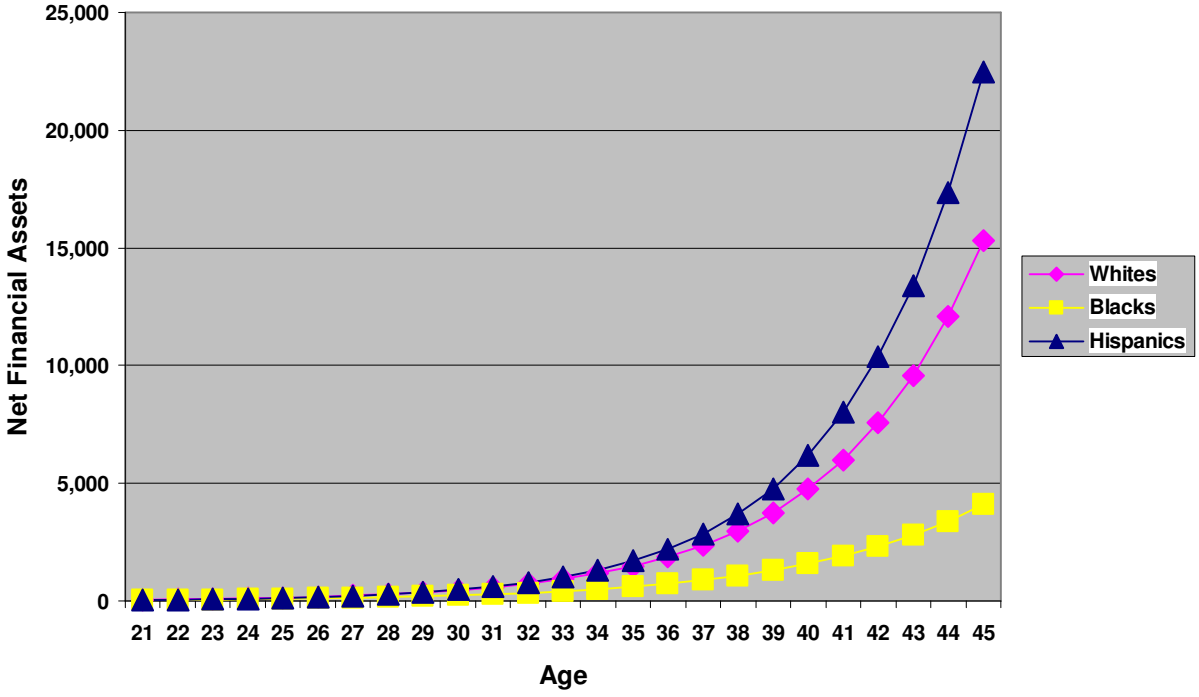


Figure 2.4 Net Financial Asset Trajectories between Ages 21 and 45 (Model 2)



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Chapter 3: Racial/Ethnic Inequalities in Wealth Trajectories from Mid- to Later-Life

Introduction

Issues of later-life economic security are increasingly important as the baby boom cohort approaches retirement age. The metaphor of a "three-legged stool" is often used to characterize the three major sources of retirement income (i.e., pensions, Social Security, and savings) in order to convey the idea that all three approaches are needed to provide stable income security in retirement. Recently, pensions have become a less reliable income source as many employers have shifted to providing pensions that are less costly to employers yet more costly and less generous to employees. Also, the increasing old-age dependency ratio has sparked a great deal of concern and speculation about the future solvency of the Social Security System. Thus, personal savings and investments (or wealth) are likely to become increasingly important sources of economic security in later-life.

Research on the economic well-being of older racial/ethnic minorities is especially important as the composition of the elderly population is projected to become more diverse over the next half century with dramatic increases in the proportion of older Blacks and Hispanics (U.S. Census 2004). Smith (1995) found that Blacks and Hispanics have considerably less pre-retirement wealth, yet it remains unclear whether racial/ethnic wealth disparities decrease, remain stable, or increase as individuals approach retirement. According to the *life cycle hypothesis*, rational actors should accumulate wealth until they retire, whereupon they begin dissaving, such that average wealth levels will increase until the modal age of retirement, after which they decline (Modigliani and Brumberg 1954; Modigliani

1986). However, this hypothesis has not been adequately tested with 1) a diverse sample, 2) longitudinal data, and 3) appropriate methods.

This study uses panel data from the Health and Retirement Study (HRS) and growth curve models to 1) investigate how wealth trajectories vary by race/ethnicity between ages 51 to 73, and 2) determine the degree to which racial/ethnic differences in life course capital (e.g., social origins, education, earnings, social security income, inheritances, family patterns, financial planning horizons, expectations, region, and health) explain racial/ethnic inequalities in wealth trajectories.

Background

Race/Ethnicity and Wealth Inequality

A number of studies have documented large racial/ethnic disparities in wealth (Conley 1999; Oliver and Shapiro 1995; Smith 1995), a wealth gap that is several times the size of the income gap (Blau and Graham 1990; Menchik and Jianakoplos 1997). The most common and comprehensive measure of wealth in the literature is *net worth*, which is calculated as the value of all assets less any debts. Middle-aged Blacks and Hispanics have approximately 27% and 30% of the net worth of their White counterparts, respectively (Smith 1995). Importantly, home equity represents a major portion of net worth for most households (Keister 2000); 79% of Whites own their homes, compared to approximately 60% among both Blacks and Hispanics (Smith 1995). Moreover, among homeowners, the average home equity value for Whites is more than twice that of Blacks (Angel and Angel 1996). Thus, racial/ethnic differences in home ownership and home value contribute substantially to disparities in the distribution of net worth (Quadagno and Reid 1996).

Minorities are also disadvantaged in terms of *net financial assets*, which exclude real estate and vehicle equity, and thus, consists of liquid assets that can be readily converted into cash for immediate household consumption. Minority-White gaps in net financial assets are even greater than net worth gaps (Oliver and Shapiro 1995): the mean net financial assets of Blacks and Hispanics are less than 18% and 15% of Whites, respectively (Smith 1995). In addition, Smith (1995) found that, compared to Whites, minorities are less likely to have any cash savings or own any stocks or bonds. Overall, it is clear that Blacks and Hispanics have a small fraction of the wealth holdings of Whites, though less is known about the racial/ethnic differences in the process of wealth accumulation.

Race/Ethnicity and Wealth Trajectories

There is a dearth of empirical research on intra-individual wealth trajectories in general and racial/ethnic differences in particular. Economic research on how savings, consumption and wealth accumulation varies across life stages has been heavily influence by the *life-cycle hypothesis* which posits that rational actors, with uncertainty about their life expectancy, should accumulate wealth until they retire at which point they begin dissaving (Modigliani and Brumberg 1954; Modigliani 1986). The life-cycle hypothesis predicts that median wealth levels rise up until the modal retirement age and declines thereafter. To examine how well the life-cycle hypothesis predicts the age-wealth profiles in a diverse sample, Land and Russell (1996) use cross-sectional data from the Survey of Income and Program Participation on respondents ranging from early adulthood to late-life. They show that 1) the life-cycle hypothesis is consistent with the age-median-wealth profiles for Whites, but not Blacks or Hispanics, 2) wealth peaks at earlier ages for minorities, and 3) the wealth gaps between Blacks and Whites and between Hispanics and Whites increase with age.

This latter finding is especially germane given that the focus of the present study is a sociological, life course examination of racial/ethnic differences in changes in wealth as individuals age rather than an explicit test of the LCH. Land and Russell (1996) note that the use of cross-sectional data to document widening wealth inequality with age is limited due to the potential confounding of age changes and cohort differences; thus, they recommend the use of longitudinal data for detecting racial/ethnic difference in age-wealth patterns.

A handful of studies have used longitudinal data to examine racial/ethnic differences in changes in wealth between two points in time. While one of the studies showed no evidence of Black-White differences in wealth changes (Hurst, Luoh, and Stafford 1998), two others have found that, Blacks experienced less wealth growth than Whites over a 10-year period (Altonji and Doraszelski 2005; Gittleman and Wolff 2004). Unfortunately, these studies excluded Hispanics and individuals with non-positive baseline values of wealth, both of which represent substantial proportions of the population. Further, each of these studies only included individuals that were re-interviewed at a second time-point, which is less than ideal because sample attrition due to mortality and loss-to-follow-up is related to wealth, and thus, studies that do not account for differential attrition rates are likely to yield biased estimates of wealth accumulation. Excluding attriters may underestimate racial/ethnic gaps in wealth growth/decline.

The method of simply examining changes in wealth between two points in time to infer difference in wealth accumulation processes represents another limitation of previous research on racial/ethnic differences in wealth growth/decline. Data from two time-points are unable to capture non-linear changes. To more fully understand how the *process* of wealth accumulation varies by race/ethnicity it is necessary to assess wealth holdings on numerous

occasions. Moreover, previous longitudinal research has typically examined disparities in rates of change over time rather than age, which is less than ideal from a life course standpoint given strong reasons to believe that wealth accumulation rates are closely linked to age (Land and Russell 1996; Modigliani and Brumberg 1954; Modigliani 1986). In sum, previous research has attempted to address these issues, empirical evidence for the growth of wealth inequality with age has been limited by methodological flaws and the scarcity of longitudinal data sources with quality wealth data. The present study, however, includes Hispanics, includes attriters, and uses age-based growth curve models to test whether wealth disparities are persistent, converging, or diverging with age.

I hypothesize that racial/ethnic disparities in wealth increase with age, consistent with previous research (e.g., Land and Russell 1996; Gittleman and Wolff 2004), and the cumulative disadvantage hypothesis of intra-cohort inequality dynamics (Dannefer 1987; 2003). In addition, it is consistent with findings that minority-owned houses experience lower rates of appreciation (Blau and Duncan 1990; Flippen 2004) and the fact that wealth produces wealth. Keister (2000) notes that interest and dividends from asset appreciation can be reinvested, facilitating further wealth growth; also, assets can be leveraged to generate more wealth (e.g., using wealth as collateral for additional investments).

The Role of Life Course Capital in Explaining Racial/Ethnic Stratification in Wealth

Racial/ethnic inequalities in stocks of life course capital (e.g., family, human, social, economic, and health capital) increase over the life course (O'Rand 2001) and are likely to contribute to racial/ethic differences in wealth accumulation. O'Rand (2001) argues that the notion of life course capital is a parsimonious heuristic for conceptualizing how various 'stocks' of resources are interrelated and dynamic over the life course. For example, one's

stock of human capital (e.g., education) both influences, and is influenced by, one's economic capital (e.g., wealth). From a life course perspective on status attainment, it is important to consider a wide array factors that may influence racial/ethnic disparities in wealth trajectories. For instance, aspects of social origins affect adult SES and likely shape racial disparities in wealth (Keister 2004; Land and Russell 1996). Disadvantages in childhood SES negatively influence attainment processes (e.g., education), and are associated with lower adulthood SES (Blau and Duncan 1967; Corcoran 1995; Teachman 1987). Education is a primary source of human capital that is consistently found to have a strong impact on individuals' occupations and ultimately their earnings. Importantly, the relationship between educational attainment and income increases with age (Crystal, Shea, and Krishnaswami 1992).

Labor markets are highly segmented along lines of race/ethnicity: Blacks and Hispanics are overrepresented in lower-paying jobs and underrepresented in higher-paying jobs (Queneau 2005); also, minorities have higher unemployment rates than Whites (Fairlie and Sundstrom 1999; U.S. Census 1999). Moreover, Blacks and Hispanics have lower average incomes (Moon and Juster 1995) and higher poverty rates than Whites (U.S. Census, 2000). Racial/ethnic differences in human capital contribute to occupational segregation and disparities in unemployment rates and earnings (Grodsky and Pager 2001; Oliver and Shapiro 1995), yet an earnings gap remains even after controlling for common human capital measures (e.g., education and training), which has led some to speculate that differentials in residual earnings are due to a failure to fully capture racial differences in skills and cognitive ability (Farkas and Vicknair 1996; Neal and Johnson 1996). However, this idea is refuted by a high-quality study by Raudenbush and Kasim (1998) showing that race differences in

earnings persist after including robust controls for background, skills, and cognitive ability. Collectively, these findings suggest that discrimination may continue to play a role in wage disparities (see Darity and Mason 1998).

Segregation plays a role in creating labor market inequality. Though declining recently, significant residential segregation along race/ethnicity persists in the U.S. (Glaeser and Vigdor 2001). The *spatial-mismatch hypothesis* contends that employment decentralization in tandem with residential segregation leads to racial/ethnic disparities in job opportunities (Carrington and Troske 1998; Kain 1968; Mouw 2000; Wilson 1987). In addition, segregated job networks contribute to racial inequality in the labor market (Mouw, 2002).

Racial/ethnic disparities in earnings are a proximate source of the racial/ethnic wealth gap (Blau and Graham 1990), because wealth accumulation increases exponentially with income level (Smith 1995), and minorities have lower incomes (Moon and Juster 1995; U.S. Census 2004). Given their lower incomes, minorities must commit a greater share of their income to essential consumables (e.g., housing, vehicles, food and clothing). Consequently, minorities have less discretionary income to commit to savings and investments (Oliver and Shapiro 1995).

Family patterns vary by race/ethnicity and may also contribute to wealth disparities. Marriage entails a number of economic benefits including 1) the marriage premium on wages, 2) economies of scale, and 3) specialization among spouses in production (Becker 1981). As a result, married couples have much higher per capita levels of wealth than those who are widowed, divorced, separated, or never married (Waite 1995; Wilmoth and Koso 2002). Compared to Whites, Blacks and Hispanics have lower rates of marriage and higher

rates of marital dissolution (Angel et al. 2003; Cherlin 1992). However, even among married couples, minority households have considerably less wealth than their White counterparts (Oliver and Shapiro 1995). Also, though some have argued that children are likely to depress wealth accumulation (Modigliani 1986), others have found no net effect of number of children on wealth (Lupton and Smith 1999).

Intergenerational financial transfers contribute to the wealth gap because minorities are less likely than Whites to receive inheritances (Smith, 1995; Wilhelm, 2001). Moreover, among inheritance recipients, minorities receive smaller inheritances. Menchik and Jianakoplos (1997) found that differences in inheritances account for approximately 10% to 20% of the minority-White disparity in wealth at a single point in time, yet it remains unclear what role inheritances play in racial/ethnic inequalities in wealth trajectories.

Clearly wealth promotes health, but racial/ethnic health disparities may also lead to diverging fortunes. The poorer health of Black and Hispanic adults compared to Whites (Angel and Angel 1996; Farmer and Ferraro 2005; Smith and Kington 1997) may cause them to fall further behind with regard to wealth as a result of stunted investments in human capital, impaired work ability, reduced earnings, and costly medical expenses (see Kim and Lee 2006). Indeed, minorities are more likely to be unable to work due to health conditions (Bound, et al. 2003; Brown and Warner 2008; Hayward, Friedman, and Chen 1996) and have lower rates of health insurance coverage (Gould 2006).

A common economic explanation for lower savings rates among the poor is that they have shorter planning horizons. Similarly, subjective life expectancies are positively related to savings (Smith 1995). Individuals that expect to experience a longer postretirement save more. Thus, one could argue that Blacks and Hispanics may save less than Whites because

they have both shorter time horizons and subjective life expectancies. Previous research on these issues has failed to empirically examine the mediating roles of the specific life course factors mentioned above in racial/ethnic disparities in wealth *trajectories*.

Racial/ethnic differences in a wide array of life course factors (e.g., childhood SES, adult SES, work and family patterns, health and financial transfers and planning horizons) are hypothesized to contribute to disparities in wealth trajectories. Controlling for these factors is expected to narrow the minority-White wealth trajectory gap. Previous research has shown that adult SES explains a portion of the Black-White gap in wealth levels (Land and Russell 1996); minority disadvantages in childhood SES and family structure contribute to racial/ethnic disparities in adult wealth levels (Keister 2004). However, others have found that more than 70% of the race gap in wealth levels persists after controlling for a range of demographic, human capital and status attainment variables (Oliver and Shapiro1999), which points to the importance of other unobserved factors such as discrimination (see Darity, 2005).

Few empirical studies have investigated factors contributing to racial/ethnic differences in prospective wealth growth. One such study reported that after accounting for racial differences in income and inheritances, Blacks and Whites exhibited comparable wealth appreciation over a 10-year period (Gittleman and Wolff 2004). Overall, evidence suggests that accounting for racial disparities in a wide array of life course factors is likely to partially mediate race differences in wealth trajectories.

Data and Methods

Sample

Data from waves 1 through 7 of the Health and Retirement Study (HRS) is used to address the research questions. The target population for Wave 1 of the HRS includes all English or Spanish-speaking adults in the contiguous United States, aged 51-61 in 1992 (spouses of respondents were interviewed regardless of age-eligibility), who reside in households. Respondents were re-interviewed in 1994, 1996, 1998, 2000, 2002, and 2004. Blacks and Hispanics were oversampled to allow independent analysis of racial groups. Only a minor proportion of individuals are institutionalized at the target ages of this study; respondents remain in the study in the event that they are institutionalized between 1992 and 2004. Analyses are based on 9,363 Black, Hispanic and White respondents aged 51 to 61 in 1992. Other racial/ethnic groups are excluded due to very small sample sizes.

Measures

Dependent Variables

Net worth. The Rand HRS Data file (Version E) (Rand 2006), a cleaned and streamlined version of the HRS, is used to construct wealth measures. Household net worth is the sum of net housing value (primary residence value – mortgages), real assets (other real estate, vehicles, and business equity), and financial assets (checking, savings and money market accounts, IRA/Keogh, 401ks, stocks, trusts, mutual funds, investment trusts, and bonds) minus debts. Pension wealth is not included because of serious data quality issues.

Net financial assets. This measure is the sum of financial assets (checking, savings and money market accounts, IRA/Keoghs, stocks, trusts, mutual funds, investment trusts, and bonds) less debt. Because repeated wealth measures are taken from different years, wealth is converted to 2004 dollars using the Consumer Price Index (CPI). Additionally, since both wealth variables are household-level measures they include the assets and liabilities for both

spouses in the case of marriage, and both partners in the case of cohabitation. Also, because the distributions of both wealth measures are skewed, the natural logarithm of their value is used.

Demographic Variables

Three dummy variables index *race/ethnicity:* White (omitted), Black, and Hispanic. Individuals are classified as Hispanic if they report being Hispanic on a question concerning one's ethnicity. Respondents are considered White if they do not report Hispanic ethnicity and report being White; similarly, individuals are classified as being Black if they report being Black and non-Hispanic. *Gender* is measured by a dummy variable (1=female; 0=male). Both *age* and age^2 are included in the analysis to capture wealth changes with age.

Social Origins

Family SES affects attainment processes and siblings dilute family economic resources and influence wealth accumulation (Keister, 2003). Childhood SES measures include indicators of father's *and mother's educational attainment* (less than high school=1; 0 otherwise), *whether the family was poor,* and *number of siblings*.

Socioeconomic Variables

Adult SES indicators include respondent's *educational attainment* (in years)*, employment status* (in the labor force, retired, or disabled), *logged household earnings* (includes monies from wages and salaries for both spouses in the case of marriage), *logged household social security income* (including social security income for disability), and *logged other income* (e.g., monies from inheritances, inter-vivos transfers, alimony, life insurance payments, lump sum payments, pension disbursements), and *health insurance coverage*.

Family Variables

Family variables include *marital status* (unmarried=1; 0 otherwise) and *number of children*.

Other Covariates

Models also include measures of *health*, *financial planning horizons*, self-reported *life expectancy,* and *region*. The health measure is a s*elf-assessed report* (respondents were asked whether they would rate their health as excellent, very good, good, fair, or poor at each wave. The outcomes range from 1 (excellent) to 5 (poor), so that lower values represent better self-rated health). A dummy variable indicates whether respondents have a *short-term financial planning horizon* (1= a year or less; 0= more than a year). A measure of *subjective life expectancy* indicates the respondents' self-reported probability of living to age 85 (ranges between 0 and 100). A series of dummy variables indicate the region in which respondents currently reside (e.g., Northeast (ref.), Mid West, South, or West). All variables are time-varying except measures of demographics, social origins, and variables that were not measured consistently across all survey waves such as life expectancy and financial planning horizon.

To establish that variable x causes variable y, x must precede y. Thus, one could argue that the independent variables should be lagged such that the dependent variable at wave t is predicted by the covariates at wave t-1. The focus of this study is not on establishing a causal relationship between the time-varying covariates and wealth, but rather on determining the extent to which racial/ethnic differences in life course factors mediate racial/ethnic inequalities in wealth trajectories. For this reason and the fact that lagging the independent variables reduces the sample size by more than 15%, the independent and

dependent variables are modeled concurrently. Furthermore, sensitivity analyses (not shown) reveal that results are substantively similar regardless of whether the covariates are lagged or not.

Because this study draws on wealth data from 7 different years between 1992 and 2004 and the fact that fluctuations in the business cycle occur, the wealth of the respondents may be somewhat higher (or lower) during particular years. This raises the concern that the estimates of the relationship between race/ethnicity and wealth may be an artifact of period effects. While supplemental analyses with dummy indicators of survey years revealed that wealth did vary across waves (net of age), the findings of this study are robust to period effects. For the sake of parsimony controls for survey year are excluded (including controls for survey year led to an additional 12 degrees of freedom).

Analytic Strategy

Life course theories posit age as the appropriate metric in the study of wealth accumulation, yet the HRS is organized by wave, not by age. Due to considerable age heterogeneity within each wave of the HRS (age range of 11), it was necessary to reorganize the data from wave to age in order to accurately test the hypotheses. This transformation is referred to as an accelerated longitudinal design, which is commonly used in developmental, survey research (see Herd 2007; Yang 2007). Supplemental analyses showed no evidence of cohort differences in the race effects, which is not surprising given the relatively narrow cohort range (1931-41).

To investigate racial/ethnic differences in wealth trajectories between the ages of 51 and 73, random coefficient growth curves were modeled within a mixed model (i.e., hierarchical linear model) framework, which is an integrated approach for studying the

structure and predictors of individual growth. These models are well-suited for panel data where individuals are repeatedly interviewed, and for the assessment of individual change with age (Raudenbush and Byrk 2002). A hierarchical strategy is used, where repeated observations (Level 1) are nested within respondents (Level 2).

The growth curve models generate individual trajectories that are based on estimates of person-specific intercepts (initial value) and slopes (rate of change) that describe intra-individual patterns of change in wealth as a function of age. Comparisons of nested likelihood ratio tests (LRTs) of various shapes of wealth trajectories (e.g. linear, quadratic or cubic models), suggested that quadratic growth curve models with random intercepts and random linear and quadratic age slopes provided the best fit to the data. After developing an accurate model of the unconditional trajectory, independent variables are added to the model in order to examine the extent to which they explain racial/ethnic disparities in wealth accumulation. To estimate the effects of the covariates on the trajectory slope, interactions between the independent variables and age are included. To minimize the problem of collinearity, interactions between covariates and age^2 are included only when they are statistically significant or improve model fit.

Covariates are mean-centered to facilitate model interpretation. If independent variables are not mean-centered, the fixed effects of age and age^2 represent the trajectory shape for respondents with values of zero on all covariates; however, when independent variables are mean-centered, the fixed effects of age represent the mean trajectory shape for individuals with average values on the continuous measures and zero values on the dummy variables, which is more substantively interesting (Singer and Willett 2003).

Not all respondents remained in the study for all 7 waves. Respondents contributed

between 1 and 7 observations (or person-years). Response rates were roughly similar across racial/ethnic groups, with Whites, Blacks and Hispanics contributing an average of 5.9, 5.5, and 5.5 observations, respectively. Importantly, respondents who attrit may have different wealth profiles than individuals who do not, which has the potential to bias estimates of wealth trajectories

To avoid such biases, this study utilizes hierarchical linear models in tandem with maximum likelihood estimation, which has the advantage of being able to incorporate all respondents who have been observed at least once, including those who attrit during the observation period, in the sample. Under these circumstances, Raudenbush and Bryk (2002) note that 1) the data may be assumed to be missing at random (MAR), meaning that the probability of missing a time point is independent of missing data given the observed data, and 2) this is a reasonable assumption when the observed data include variables related to both missingness and the dependent variable. Assuming the data are MAR, because all of the data are used in the analysis and a fully efficient estimation procedure (maximum likelihood) is utilized, estimates from the growth curve models are asymptotically unbiased (Raudenbush and Bryk 2002).

Furthermore, to account for racial/ethnic differences in attrition, an indicator of the number of waves contributed is included in the models. Supplemental analyses showed that results were robust to the inclusion of a dummy indicator of prospective mortality, as well the exclusion of those who attrited. Neither of these adjustments resulted in appreciable changes in the size or significance of the race/ethnicity effects, therefore, they are not presented

Since the dependent variable (net worth) is logged, the relative effect for dichotomous independent variables is revealed by subtracting one from the coefficient antilog; coefficients

for continuous covariates indicate the relative change in wealth for a one unit increase in the covariate. The percentage change in wealth is revealed by multiplying the coefficient by 100 (Hardy 1993: 57).

Results

Net Worth Trajectories

Table 3.2 presents random coefficient growth model estimates of racial/ethnic differences in net worth trajectories between mid- and later life. Overall, findings in Table 3.2 show that the there are substantial wealth gaps between racial/ethnic groups and that these disparities increase with age, consistent with the process of cumulative disadvantage. Compared to White households, Hispanic and Black households have significantly lower wealth intercepts (i.e., wealth levels at age 51). Hispanics have approximately 8.8% ($e^{-2.434}$ = .088) of the net worth of Whites; Blacks have less 2% ($e^{-3.914}$ = .0199) of the net worth of Whites (Model 1). In addition, Whites experience more rapid wealth accumulation than their minority counterparts: whereas the net worth of Whites increases at a rate of 8.9% (.089 × 100) per year, the corresponding rates among Hispanics and Blacks are 3.8% (8.9% - .5.1%) and 11.9% (8.9% + 3.0%) , respectively. Though wealth increases faster for Blacks than Whites in terms of percentages, it is important to note that because Whites have much high wealth intercepts, they have much steeper wealth slopes in terms of real dollars than Blacks.

The magnitudes of racial/ethnic inequalities in wealth are revealed in Figure 3.1, which shows simulated wealth trajectories by race/ethnicity. These simulations are based on the coefficient estimates in Table 3.2 (to ease interpretation log wealth is converted to real dollars). At age 51, White households have an average net worth of $73,571, compared to only $6,451 and $1,469 among Hispanic and Black households, respectively. The net worth

of Whites increases substantially during their 50s and 60s, before declining slightly in their early 70s. Hispanics and Blacks also exhibit curvilinear trajectories, though on a much smaller scale. Overall, the wealth gap between Whites and minorities increases rapidly during mid- and late-life: whereas White households possess net worths of $122,028 at age 73, Hispanic and Blacks household have only $3,484 and $4,713, respectively.

Model 2 adds controls for social origins, human capital, adult SES, family context, health, financial planning horizon, subjective life expectancy, and region. Controlling for minorities' disadvantages in life course capital eliminates the Hispanic-White wealth gap, and somewhat reduces wealth disparities between Blacks and Whites. Hispanic and White households have similar levels of wealth at age 51, net of life course capital. A very different story emerges among Blacks. Even after controlling for racial differences in life course capital Black households have only 8.2% ($e^{-2.250}$=.082) of the wealth of White households. Racial/ethnic differences in wealth slopes remain after controlling for life course capital. Whites continue to amass wealth more rapidly than their Hispanic and Black counterparts. While the annual percentage increases are similar for Whites and Blacks, Whites accumulate more wealth per year because they have more wealth at the outset.

Figure 3.2 shows that, despite controlling for an array of life course factors, wealth trajectories continue to differ by race/ethnicity. Although Hispanics appear to have lower wealth intercepts than Whites, the results suggest that Whites and Hispanics both have approximately $188,533 at age 51, compared to $19,871 among Blacks. Figure 3.2 also shows that wealth slopes vary dramatically across racial/ethnic groups. Whereas Whites exhibit rapid wealth accumulation during their 50s through their mid 60s at which point they begin deccumulating, Hispanics experience steep declines between ages 51 and 73, and,

though low at all ages, the wealth of Blacks increases at a moderate rate through the mid 60s followed by slight declines. Overall, racial/ethnic disparities in wealth increase with age, even after accounting for racial/ethnic inequalities in life course capital. By age 73, White households are predicted to have approximately $319,665, compared to $36,280 and $39,302 among Hispanic and Black households. The fact that wealth disparities are not eliminated after accounting for a wide array of life course factors suggests that racial/ethnic differences in savings rates and/or returns on investments may play a major role in generating disparate wealth trajectories (see Altonji, Doraszelski 2005; Gittleman and Wolff 2004).

Net Financial Asset Trajectories

Growth curve models of financial net asset trajectories are presented in Table 3.3. Consistent with the cumulative disadvantage hypothesis, minorities have less financial wealth than Whites and the gap widens with age. Estimates from Model 1 indicate that Hispanics and Blacks have less than 1% ($e^{-5.275} = .005$ and $e^{-4.864} = .008$, respectively) of the financial wealth of Whites at age 51. Moreover, Whites have steeper NFA trajectory slopes: whereas the linear and quadratic slopes of Whites' trajectories are 20.5% and -0.6%, respectively, the corresponding rates among Hispanics are 5% (20.5%-15.5%) and 0.2% (-0.6% + 0.8%), and the rates for Blacks are 7.8% (20.5%-12.7%) and -.2% (-0.6% + 0.4%).

Figure 3.3 shows the shape of the NFA trajectories and the magnitude of the racial/ethnic disparities. These simulations are based on the coefficient estimates in Model 1 of Table 3.3. Whites' trajectories are characterized by a low intercept followed by a steep increase in NFAs between ages 51 and 68, and slight declines thereafter. Conversely, the NFA trajectories of Blacks and Hispanics are characterized by extremely low intercepts and

relatively flat slopes. By age 73, Whites are predicted to have $7,398 in financial wealth, compared to less than $80 for both Hispanics and Blacks.

Model 2 of Table 3.3 includes the control measures. Large disparities in net financial assets remain after controlling for racial/ethnic differences in life course capital. In Model 2, Hispanics have approximately 11.5% ($e^{-2.159} = .115$) of the financial wealth of Whites; Blacks have just 6.1% ($e^{-2.8011} = .061$) of the financial wealth of their otherwise similarly situated White counterparts. In addition, both Hispanics and Blacks have lower annual rates of wealth growth than Whites, net of controls. Simulations of NFA trajectories by race/ethnicity, net of controls, are presented in Figure 3.4. These simulations are based on the coefficient estimates in Model 2 of Table 3.3. Figure 3.4 shows that, after controlling for racial/ethnic differences in life course capital, Hispanic-White and Black-White disparities in net financial assets continue to increase substantially with age.

Discussion

Economic well-being in later life is shaped by three sources of income: social security, pensions, and personal savings/investments. Importantly, wealth is likely to become an increasingly key source of financial support for older adults, as social security benefits are at risk of being cut or reduced, and because fewer individuals are able to rely on substantial incomes from pensions. Wealth is one of the most unequally distributed resources in America. While racial/ethnic inequalities in levels of wealth are well-documented, less is known about how the process of accumulating wealth varies by across racial/ethnic groups. This study is among the first to both conceptualize and measure the long-term wealth trajectories of Blacks, Whites and Hispanics. A life course perspective and longitudinal data

are utilized to examine racial/ethnic differences in wealth growth and decline between mid- and later-life.

Findings show that wealth trajectories vary dramatically by race/ethnicity. By mid-life, enormous disparities in net worth have emerged. The average net worth of White households at age 51 is over $73k, compared to less than $7k and $2k among Hispanic and Black households, respectively. Moreover, Whites experience much more rapid rates of wealth accumulation during their 50s and 60s than their minority counterparts, resulting increasing wealth disparities with age, consistent with a process of cumulative disadvantage. At the peak of their wealth (at age 68) Whites have approximately $158k more than Hispanics and Blacks. Similarly, Whites have higher levels of net financial assets than minorities, and the gap widens with age.

In addition, this study investigated the role that life course capital plays in contributing to wealth disparities. The potential mediating factors examined were much more extensive, and spanned a longer period, than those of previous studies (e.g., Altonji and Doraszelski 2005; Gittleman and Wolff 2004). A range of indicators of life course capital were shown to be related to wealth accumulation including social origins, human capital, wages, social security income, financial transfers, health, family circumstances, and neighborhood context. However, these factors accounted for only a minor fraction of the minority-White wealth gaps. Even after controlling for racial/ethnic inequalities in life course capital, Hispanics and Blacks were at a major disadvantage, compared to Whites, both in terms of wealth levels and wealth growth with age. Several potential explanations for the residual racial/ethnic wealth gaps are discussed below.

Some have argued that minorities experience stunted wealth growth, compared to Whites because they commit less of their income to savings/investments (Altonji and Doraszelski 2005). Indeed, as much as 25-30% or minorities are "unbanked", or do not have accounts at depository institutions (e.g., banks, credit unions, and thrifts; Hogarth and O'Donnell 1999). However, empirical analyses cast doubt on explanations of wealth disparities that focus on savings behavior. Studies by Conley (1999) and Gittleman and Wolff (2004) showed that there are no racial/ethnic differences in savings rates, after controlling for income. Another potential explanation for wealth disparities concerns racial/ethnic inequalities in rates of return on investments. Related to this are racial/ethnic differences in wealth composition. Whereas a majority of the wealth of Blacks is invested in functional assets (e.g., homes or vehicles) rather than financial assets, just the opposite is true among Whites (Oliver and Shapiro 1995; Terrell 1971). For example, stocks represent only 1% of Blacks' wealth, compared to 9% among Whites. Though financial assets such as stocks are more risky than conservative investments like housing, they tend to increase in value more rapidly, yielding better long-term rates of return. Blacks and Hispanics are also at a disadvantage in that their real assets such as housing appreciate at lower rates (Flippen 2004). While it seems plausible that racial/ethnic differences in returns on investments may contribute to wealth disparities, empirical analysis suggests that minorities and Whites with comparable levels of income have similar wealth portfolio compositions.

Discriminatory practices, such as redlining and predatory lenders targeting minorities are likely to inhibit wealth accumulation in minority communities and contribute to the wealth gap. Blacks and Hispanics are more likely than Whites to receive sub-prime mortgages, even after controlling for factors such as the amount of the loan, and the

borrower's income (Avery, Brevoort, and Canner 2006) and credit history (National Community Reinvestment Coalition 2003). Sub-prime mortgages have exceptionally high interest rates in order to offset the higher risks of lending to borrowers with weak credit histories and/or high debt-to-income ratios. Features of sub-prime mortgages such as pre-payment penalties and balloon payments increase the likelihood of foreclosure. Audit studies of discrimination in housing markets suggest that Blacks and Hispanics receive diminished opportunities 16% and 20%, respectively, when looking to buy a house (Turner et al. 2003). While the probability of experiencing discrimination in any given transaction is somewhat modest, when such odds are applied to the number of significant economic transactions over course of one's life, the cumulative effects of discrimination are likely to be sizeable and affect economic mobility (Favreault 2007).

Altonjii and Doraszelski (2005) argue that racial/ethnic differences in social networks may also influence wealth inequalities, consistent with the life course principle of linked lives—lives are lived interdependently and socio-historical influences are expressed through this network of shared relationships (Elder et al. 2003). The basic idea behind their premise is that the friends and family members of Blacks and Hispanics are likely to be worse off economically than those of Whites, and that in economically depressed communities there may be especially strong norms of social responsibility whereby prosperous individuals are expected help those in need (Chiteji and Hamilton 2002). In this way, the wealth accumulation of relatively high-earners in minority communities is diminished because discretionary income is transferred rather than saved or invested, thereby contributing to racial/ethnic inequalities in wealth. Indeed, Chiteji and Hamilton (2002) find that accounting

for the economic situations of parents and siblings reduced the Black-White wealth gap by more than a quarter.

This study may have omitted factors central to wealth accumulation and the racial/ethnic wealth gap. For example, analyses do not control for the respondents' parents' wealth because that information is not available in the HRS, which is unfortunate because parental wealth affects one's prospects for intra-generational upward wealth mobility by enhancing educational and occupational opportunities as well as access to credit (Evans and Jovanovic 1989; Holtz-Eakin, Joulfaian and Rosen 1994). In addition, parental wealth may play a critical role in the transmission of racial/ethnic inequalities across generations (Conley 1999). Nor are indicators of experiences of discrimination included in the models. That said, this study includes a wider range of mediating variables than is common in the literature on racial/ethnic differences in wealth (e.g. human capital, SES, financial transfers, and demographic factors), and is among the first to include measures of such factors at numerous points across the life course. This is critical to understanding mechanisms behind wealth inequalities because the amount of wealth accumulated at a particular point in time is dependent on savings and consumption patterns in previous years, and is therefore influenced not only by current circumstances, but also by demographic and SES histories (Altonji, Doaszelski and Segal 2000). With the inclusion of time-varying measures of income, this study comes closer to capturing permanent income—a primary determinant of savings and consumption behavior—than previous studies on racial/ethnic inequalities in wealth.

While previous research suggests that the correlations between income and wealth may be weaker among minorities than Whites (Altonji and Doraszelski 2005; Campbell and Kaufman 2006), supplemental analyses did not find evidence of such interactions. Analyses

presented in this study assume that the indicators of life course capital have similar relationships with wealth for Whites, Blacks and Hispanics. A full investigation of racial/ethnic differences in the sensitivity of wealth trajectories to life course factors is beyond the scope of this study, though future research on this topic is needed.

Households at the upper end of the wealth distribution may not be included in this study since extremely wealth households are less likely to participate in surveys on finances such as the HRS, as well as the NLSY, PSID and SIPP. In addition, individuals at the lower end of the wealth distribution such as the homeless are likely to be excluded from this study since households were used as the sampling unit. Given that Whites are disproportionately represented in the upper tail of the wealth distribution, and that racial/ethnic minorities are more likely than Whites to be homeless, analyses presented here may underestimate racial/ethnic wealth disparities.

This study is among the first to investigate trajectories of wealth trajectories during the transition from mid- to later-life. Understanding savings and investment behaviors in earlier in life is also important because assets accumulated during early adulthood often appreciate considerably and compound over time, having significant consequences for financial security in later life. Unfortunately, the available data do not permit the analysis of wealth trajectories at earlier life stages. Because longitudinal studies just began collecting high-quality information on assets and liabilities in the mid 1980s (NLSY in 1985; PSID and SIPP in 1984; HRS in 1992), data on intra-individual changes in wealth across the entire adult lifespan does not exist. Findings from this study suggest that, among the 1931-41 cohort, the average White household has amassed considerable wealth that will be able to be used as retirement income, but typical Hispanic and Black households have not, suggesting

that minorities will need to rely heavily on social security for retirement income. Moreover, their lack of personal savings may mean that many Blacks and Hispanics will need to delay or forgo retirement (Brown and Warner, 2008). Research on the wealth of minority baby boomers is particularly important as the cohort approaches retirement and as composition of the elderly population is projected to become more diverse over the next half century, with dramatic increases in the proportion of older Blacks and Hispanics (U.S. Bureau of the Census 2004). Future research ought to examine racial/ethnic differences in wealth trajectories of baby boomers. The National Longitudinal Study of Youth (NLSY79) is an ideal source for such a study because it is a longitudinal survey with wealth information on baby boomers from age 20 through mid-life.

Findings from this study show that wealth inequalities in mid-life are enormous and that they continue to increase into the later years, consistent with a process of cumulative advantage. Though social origin, and various forms of capital affect wealth accumulation, controlling for these factors did not fully explain racial/ethnic wealth disparities. In addition to racial/ethnic differences in life course capital, Whites' steeper wealth trajectories are likely due to that fact that, compared to Blacks and Hispanics, they have a more assets, higher valued assets, invest a greater percentage of their wealth holdings in high-return investments, and are more likely to invest early in the life course—facilitating rapid wealth growth due to asset appreciation and compounding over time. Future research should investigate differences in trajectories of ownership and value of particular assets (e.g., homes, businesses, stocks, mutual funds, IRAs, savings accounts), as well as the specific factors that under lie racial/ethnic differences in wealth trajectories over the life course such as

permanent income, credit histories, financial transfers, savings rates, financial literacy and discrimination.

Table 3.1 Weighted Descriptive Statistics

Variables	Whites	Blacks	Hispanics
Ln Net Worth[ab]	11.27	7.08	8.51
Ln Net Financial Assets[ab]	7.59	2.01	2.17
Female[ab]	51.22	57.70	54.15
Poor family[ab]	23.52	31.34	33.57
Mother had < H.S. Education[ab]	58.99	81.31	91.11
Father had < H.S. Education[ab]	64.38	83.60	87.60
Years of Education[ab]	12.66	11.21	8.40
Ln Earnings[ab]	9.28	7.84	7.82
Ln Social Security Income[ab]	1.29	1.81	1.68
Ln Other income[ab]	1.01	0.47	0.52
Uninsured[ab]	13.29	21.04	39.42
Probability of surviving to 85[ab]	42.02	49.65	34.97
Short-term financial planning[ab]	24.34	41.31	47.69
Unmarried[ab]	20.64	48.16	29.36
Number of children[ab]	3.12	3.62	3.91
Self-rated health[ab]	2.42	3.07	3.06
Midwest[ab]	28.02	18.63	4.80
West[ab]	15.05	5.85	38.60
South[ab]	38.66	54.07	45.50
N	6855	1659	855

[a] White-Black difference is statistically significant at .05 level

[b] White-Hispanic difference is statistically significant at .05 level

Table 3.2 Net Worth Trajectories between Ages 51 and 73; Growth Curve Models

		Model 1	Model 2
Fixed Effects			
Initial status, π_{0i}	Intercept	11.206 ***	12.147 ***
	Black	-3.914 ***	-2.250 ***
	Hispanic	-2.434 ***	-0.240
	Female	-0.328 **	0.134
	Poor family		-0.425 **
	Mother had < H.S. Education		-0.012
	Father had < H.S. Education		0.169
	Years of Education		0.257 ***
	Earnings		0.027 +
	Social Security Income		-0.042 **
	Other income		0.029 *
	Uninsured		-0.179
	Probability of surviving to 85		-0.002
	Short-term financial planning		-1.033 *
	Unmarried		-2.092 ***
	Number of children		-0.092 ***
	Self-rated health		-0.343 ***
	Midwest		0.238
	West		0.185
	South		-0.211
	Number of waves	0.183 ***	0.129 *
Rate of linear change, π_{1i}	Intercept	0.089 ***	0.090 ***
	Black	0.030 ***	0.007
	Hispanic	-0.051 ***	-0.088 ***
	Female	-0.024 **	-0.019 *
	Poor family		0.027 **
	Mother had < H.S. Education		0.006
	Father had < H.S. Education		-0.019 +
	Years of Education		-0.002
	Earnings		0.0
	Social Security Income		0.003 *
	Other income		0.0
	Uninsured		-0.021
	Probability of surviving to 85		0.0
	Short-term financial planning		0.025 **
	Unmarried		0.026 **
	Number of children		0.002
	Self-rated health		0.001
	Midwest		0.023 +
	West		0.027 +
	South		0.042 ***
	Number of waves	0.009 *	0.003
Rate of quadratic change, π_{2i}	Intercept	-0.003 ***	-0.003 ***
Random Effects			
	Level 1 Residual	2.993 ***	2.960 ***
	Level 2 Intercept	4.159 ***	3.640 ***
	Level 2 Age	0.484 ***	0.459 ***
	Level 2 Age^2	0.016 ***	0.015 ***
	N	9369	8501
	Log Likelihood	-146930	-132931

+p <.1; *p<.05; **p<.01; ***p<.001

Figure 3.1 Net Worth Trajectories between Ages 51 and 73 (Model 1)

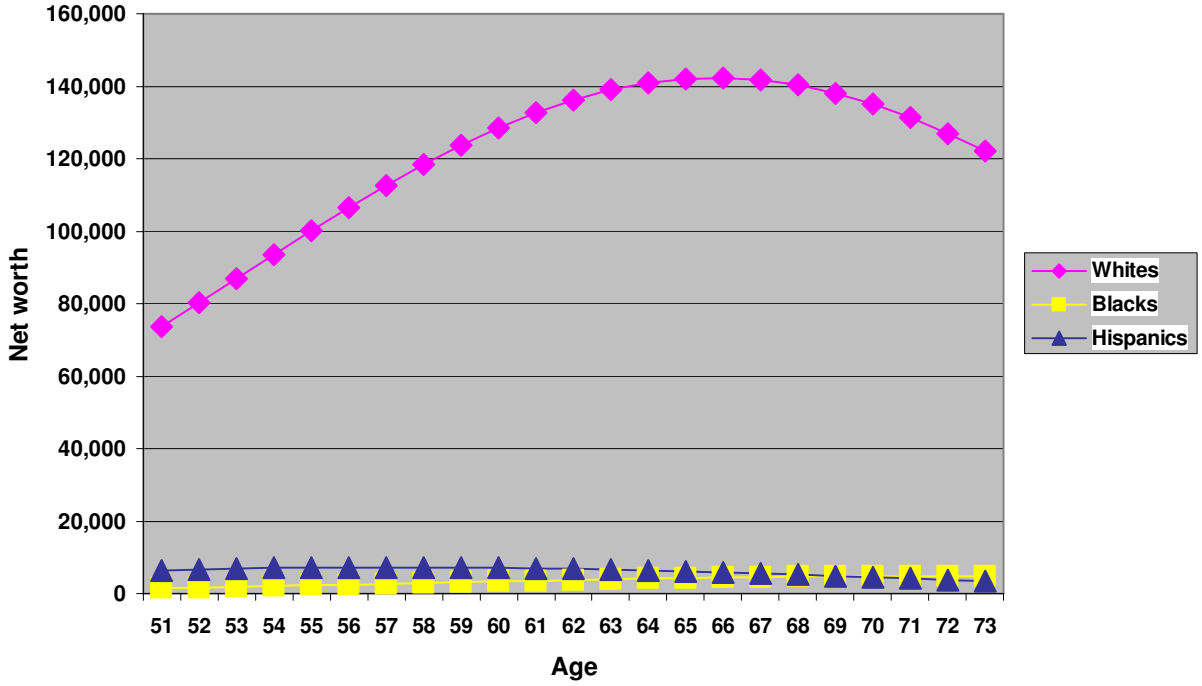


Figure 3.2 Net Worth Trajectories between Ages 51 and 73 (Model 2)

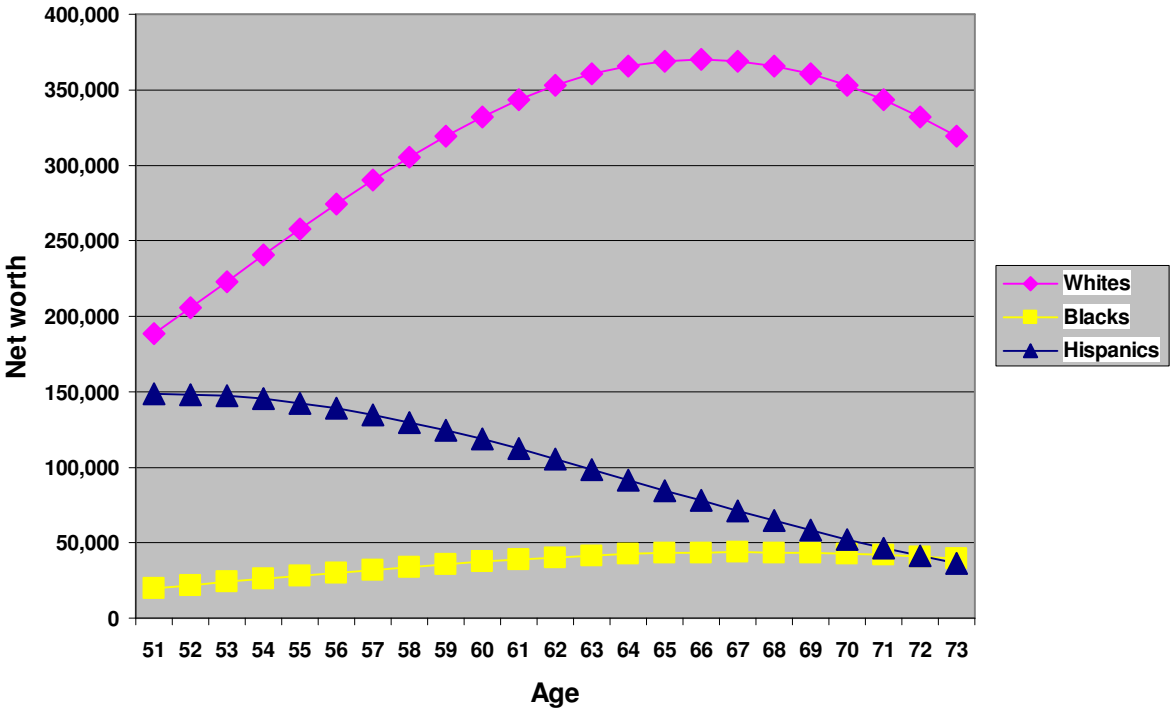


Table 3.3 Net Financial Asset Trajectories between Ages 51 and 73; Growth Curve Models

		Model 1		Model 2	
Fixed Effects					
Initial status, π_{0i}	Intercept	7.303	***	8.773	***
	Black	-4.864	***	-2.801	***
	Hispanic	-5.275	***	-2.159	***
	Female	-0.255		0.259	
	Poor during childhood			-0.303	
	Mother had < H.S. Education			-0.279	
	Father had < H.S. Education			0.216	
	Years of Education			0.412	***
	Earnings			0.056	***
	Social Security Income			-0.015	
	Other income			0.049	*
	Uninsured			-0.449	*
	Probability of surviving to 85			0.002	
	Short-term financial planning			-1.518	***
	Unmarried			-1.654	***
	Number of children			-0.316	***
	Self-rated health			-0.549	***
	Midwest			0.320	
	West			0.692	**
	South			-0.297	
	Number of waves	0.176	***	0.057	
Rate of linear change, π_{1i}	Intercept	0.205	***	0.234	***
	Black	-0.127	*	-0.111	*
	Hispanic	-0.155	*	-0.138	+
	Female	-0.023	*	-0.018	
	Poor during childhood			0.022	
	Mother had < H.S. Education			0.009	
	Father had < H.S. Education			-0.035	*
	Years of Education			-0.001	
	Earnings			-0.001	
	Social Security Income			0.001	
	Other income			0.001	
	Uninsured			-0.037	+
	Probability of surviving to 85			0.001	
	Short-term financial planning			0.020	
	Unmarried			0.015	
	Number of children			0.004	
	Self-rated health			0.005	
	Midwest			0.020	
	West			-0.030	
	South			0.005	
	Number of waves	0.009		0.006	
Rate of quadratic change, π_{2i}	Intercept	-0.006	***	-0.006	***
	Black	0.004	+	0.002	
	Hispanic	0.008	*	0.006	+
Random Effects					
	Level 1 Residual	4.423	***	4.417	***
	Level 2 Intercept	5.801	***	5.223	***
	Level 2 Age	0.611	***	0.587	***
	Level 2 Age ^{2}	0.019	***	0.017	***
	N	9369		9369	
	Log Likelihood	-167470		-152284	

+p <.1; *p<.05; **p<.01; ***p<.001

Figure 3.3 Net Financial Asset Trajectories between Ages 51 and 73 (Model 1)

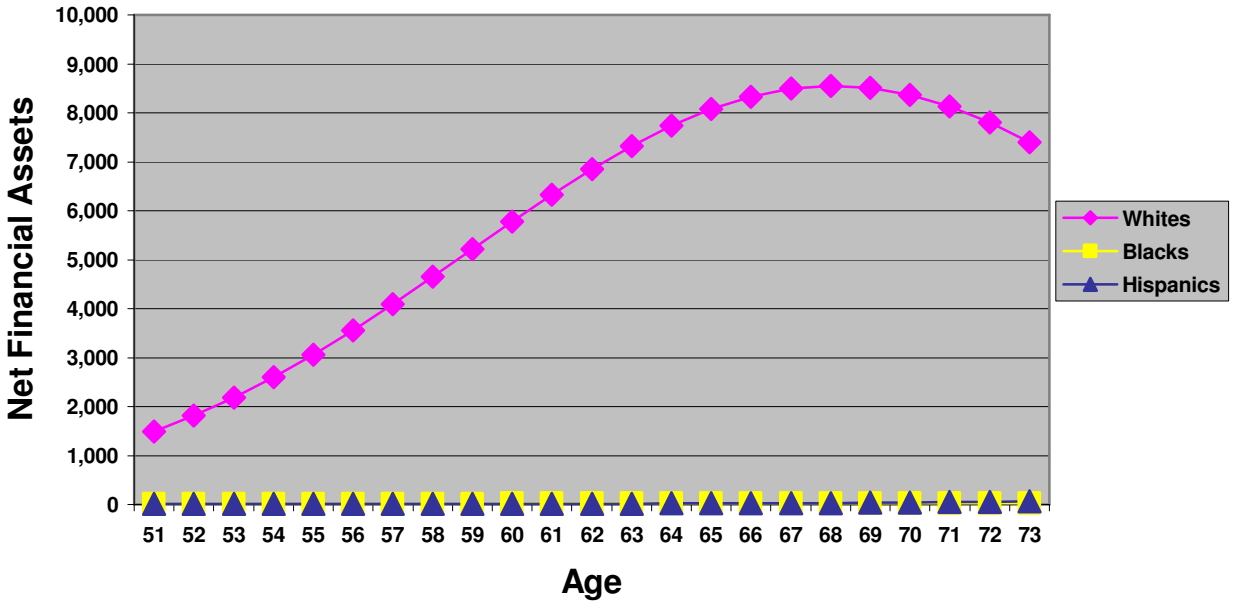
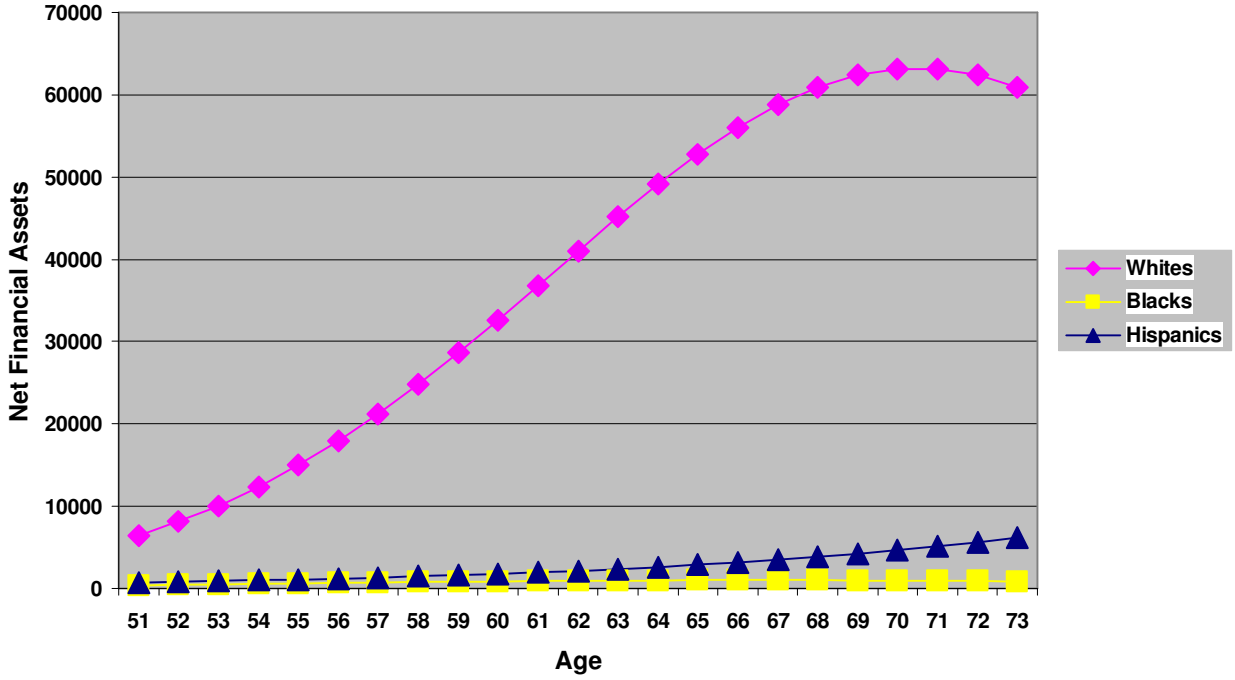


Figure 3.4 Net Financial Asset Trajectories between Ages 51 and 73 (Model 2)



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Chapter 4: Racial/Ethnic Disparities in Health Trajectories from Mid- to Later-life

Introduction

The health of older Americans is improving, yet dramatic health disparities between Whites and racial/ethnic minorities exist, and these disparities do not appear to be narrowing over time (Martin et al. 2007). Research on the relative well-being of older minorities is particularly important as the composition of the elderly population is projected to become more diverse over the next quarter century, with significant increases in the proportion of older Blacks and Hispanics (U.S. Bureau of the Census 2004). An abundance of empirical research shows that minorities experience poorer health than Whites on a wide array of indicators including chronic conditions and functional limitations (Elo and Preston 1997; Kelley- Moore and Ferraro 2004; Manton and Gu 2001; Markides et al. 1997; Williams 2005). Though disparities in health *levels* are well-documented, less is known about racial/ethnic differences in chronic condition and functional limitation *age-trajectories* (i.e., long-term, intra-individual rates of stability and change in health with age). This study investigates whether racial/ethnic health disparities decrease, remain stable or increase with age.

The lack of knowledge about whether and how age-trajectories of health vary by race/ethnicity is due to the limitations of the conceptual, methodological, and data choices of prior studies. First, many studies have used cross-sectional data to infer aging processes (e.g., Geronimus et al. 2006). However, longitudinal data measuring health at numerous points in the life course are necessary to understand diverse aging experiences. Second, even among

longitudinal studies of health disparities with respondents of dissimilar ages, most have used survey waves instead of age as the time metric, which can obscure racial/ethnic differences in age-related changes in health. Third, many explore transitions over relatively short periods. Fourth, few studies have examined health trajectories of Hispanics. Fifth, many studies fail to account for nonrandom sample attrition (i.e., mortality selection), which may bias estimates of racial/ethnic disparities in health dynamics given racial/ethnic difference in mortality rates (see Beckett 2000).

The proposed study extends previous research on health disparities by drawing on life course theory, and by both conceptualizing and modeling chronic condition and functional limitation trajectories as dynamic life course processes. Specifically, this study 1) investigates racial/ethnic differences in intra-individual health changes on numerous occasions, 2) analyzes intra-individual change as a function of age, 3) examines trajectories over an extended period (ages 51-73), 4) includes Blacks, Hispanics and Whites, and 5) accounts for nonrandom attrition. In addition, we examine the extent to which racial/ethnic differences in various forms of life course capital (social origins, and human, economic and social capital) account for racial disparities in health intercepts (initial health status) and slopes (rates of change). Examining racial/ethnic disparities in health trajectories is useful for understanding diverse aging experiences, and intracohort inequality dynamics, more generally.

Background

Life Course Perspectives

Within the life course tradition, three competing perspectives have emerged to explain intracohort inequality as the cohort ages. The *status leveling hypothesis,* proposed by

Dowd and Bengtson (1978), posits that aging involves negative health consequences for both advantaged and disadvantaged populations, and that those with health advantages earlier in life have the most to lose in terms of health decline. Therefore, racial/ethnic disparities in health should attenuate later in life. The *status maintenance hypothesis* asserts that intracohort stratification is constant as the cohort ages. Sociodemographic and human capital factors have persistent effects on well-being over time (see Henretta and Campbell 1976). According to this hypothesis, one would predict racial/ethnic inequalities in health to remain stable with age (e.g., Clark and Maddox 1992).

Alternatively, the *cumulative advantage/disadvantage* or *double jeopardy hypothesis* posits that intracohort inequality increases as the cohort ages (Dannefer 1987; 2003; Ferraro and Farmer 1996; O'Rand 1996). Disadvantages early in life shape social and developmental pathways and lead to subsequent disadvantages. Thus, racial/ethnic health disparities are hypothesized to increase with age.

The health gap between minorities and Whites is likely to widen with age as a result of the accumulation of disadvantages in life course capital (e.g. human, economic, social, and personal capital; O'Rand 2001) that minorities experience. The lives of Whites, Blacks, and Hispanics evolve in very different ways with respect to risk factors for morbidity and functional limitations. Minorities are disadvantaged in terms of social origins, education, occupations, earnings, social support, access to care, wealth and health behaviors—all of which influence health outcomes (Newman 2003). Because various forms of life course capital interact over time (O'Rand 2001), racial/ethnic inequalities in human, economic and social capital in early life are likely to increase and accentuate health disparities over the life course.

Racial/ethnic health disparities

Racial/ethnic disparities in health are well-documented. Blacks experience worse health than Whites on an array of health outcomes. For example, Black adults have a higher prevalence of diabetes, arthritis, hypertension, strokes, and heart disease than their White counterparts (Blackwell, Collins, and Coles 2002; Reed, Darity, and Robertson 1993; Schoenbaum and Waidmann 1997). Blacks also report having worse self-rated health than Whites (Farmer and Ferraro, 2005; Smith and Kington 1997). Furthermore, though rates of functional limitations and disability have recently declined (Freedman, Martin, and Schoeni 2002), Black continue to have substantially higher rates of disability than Whites, (Kelley-Moore and Ferraro 2004; Manton and Gu 2001; Schoenbaum and Waidmann 1997). In addition, compared to Whites, Blacks have shorter life expectancies, have higher all-cause mortality rates, and mortality due to diseases of the heart, malignant neoplasms, and cerebrovascular diseases (Elo and Preston 1997; National Center for Health Statistics 2003).

The picture of Hispanic health and well-being is more complex. On the one hand, Hispanics exhibit higher rates of hypertension, kidney disease and diabetes than Whites (CDC 2004a; Markides, Coreil, and Rogers 1989; Stern and Haffner 1990). Additionally, compared to Whites, Hispanics consistently report worse self-assessed health (Angel and Angel 1996). They also have poorer functional health than Whites, indicated by their higher rates of disability (Markides et al. 1997). On the other hand, Hispanics have been shown to have a health advantage over Whites in terms heart disease and cancer (Markides et al. 1997). Moreover, Hispanics have lower all-cause mortality rates than Whites after age 50, owing to their lower rates of heart disease and cancer mortality (Elo and Preston 1997; Markides et al. 1997; Palloni and Arias 2004; Singh and Siahpush 2001).

Findings that Hispanics have lower morbidity and mortality rates than Whites despite their disadvantaged socioeconomic positions is known as the 'Hispanic paradox'. Given their lower levels of human and economic capital, one would expect Hispanics to have much worse health than Whites, as is the case with Blacks. Several hypotheses have been proposed to explain Hispanics' surprisingly good health. First, a cultural and social 'buffering' explanation asserts that Hispanics have lower rates of morbidity and mortality than Whites because of their more favorable health behaviors (i.e., Hispanics are less likely to smoke and drink alcohol) and stronger family support systems (Abraido-Lanza et al. 1999). Second, the healthy migrant selection hypothesis posits that migration is positively selective on an array of characteristics and those who migrate to the U.S. are healthier than their native-born counterparts (Landale, Oropesa and Gorman 2000). A third hypothesis, known as the 'salmon bias' asserts that the relatively good health and low rates of adult mortality among Hispanics in the U.S. is a statistical artifact, owing to the return migration of migrants in poor health. Indeed, Paloni and Arias (2004) showed that accounting for return migration explained foreign-born Mexicans' health advantage over non-Hispanic Whites.

Race/ethnicity and health trajectories

Though substantial bodies of research find that racial/ethnic disparities in health exist, relatively few studies examine differences in health trajectories. Among the few that have, there is evidence that health disparities are magnified over time, consistent with the cumulative disadvantage hypothesis. For instance, Ferraro and colleagues (1997) reported that self-assessed health declined at a faster rate for Blacks than Whites. Another longitudinal study (spanning 15 years) showed that among respondents with heart failure, Blacks had higher risks than Whites of becoming disabled (Ferraro and Farmer 1996a). Also, findings

from a study by Kelley-Moore and Ferraro (2004) suggested that Blacks experience steeper disability trajectories. However, as predicted by the status maintenance hypothesis, findings from a study by Clark and Maddox (1992) reported that the Black-White gap in functional health was stable over time. Very few studies have examined how the health trajectories of Hispanics compare to Whites. One exception is a San Antonio-based study by Markides and colleagues (1989) which indicated that Mexican Americans and Whites experienced similar levels of health changes over a 4-year period.

Importantly, previous research on racial/ethnic health disparities over time may have been biased due to inattention to nonrandom attrition in panel studies. Longitudinal data measuring health at three or more times is necessary to estimate trajectories of health. One drawback of longitudinal data, however, is the introduction of attrition due to refusal, loss to follow-up, institutionalization, and death, which are nonrandom (Beckett 2000; Lillard and Panis 1998). Racial/ethnic minorities, lower SES individuals and those in poorer health have higher rates of mortality (Hummer 1996); thus, the surviving sample is likely to be disproportionately healthy, wealthy and White. Consequently, studies that fail to account for nonrandom attrition are likely to underestimate race gaps in health over time (Kelley-Moore and Ferraro 2004).

From a public health and life course perspective, it is important to investigate how the minority-White health gap changes with age. Although previous studies (noted above) have examined racial/ethnic differences in health over *time*, research to date has not used growth curve models to examine whether, and how, racial/ethnic disparities in health vary by *age* in mid- and later-life. This is an important distinction because studies that examine racial/ethnic disparities in health trajectories over time for respondents of dissimilar ages run the risk of

confounding age changes and cohort differences (see Yang 2007), which can obscure racial/ethnic differences in age-related changes in health. The present study investigates racial/ethnic differences in age-trajectories of health. Consistent with the *cumulative disadvantage* (Dannefer 1987; 2003; O'Rand 1996) and *double jeopardy hypotheses* (Ferraro and Farmer 1996), health disparities between minorities and Whites are expected to increase with age.

The Role of Life Course Factors in Explaining Racial/Ethnic Health Disparities

Life course research emphasizes how aspects of social origins shape health and well-being over the course of individuals' lives. For instance, a recent study by Warner and Hayward (2006) shows that childhood SES influences social pathways and ultimately late-life health (see also Elo and Preston 1992; Marmot et al. 2001). Childhood SES indirectly influences mortality via adult socioeconomic achievement processes (e.g., education, occupation, earnings, wealth); race differences in childhood SES partially explain the race gap in mortality (Warner and Hayward 2006).

Education is a powerful determinant of SES, as it influences a wide array of life chances including the likelihood of employment, and one's occupation, earnings, and wealth accumulation; also, it is positively associated with self-rated health and physical functioning (Ross and Wu 1996). In addition to influencing access to economic resources, education indirectly affects health via social psychological factors (e.g., social support, and self-efficacy) and health lifestyle choices (e.g., exercise, moderate alcohol consumption, and avoiding smoking) (Ross and Wu 1995). Also, income is associated with better self-rated health, and lower risks of functional impairment, morbidity, and mortality (Mirowsky and Hu 1996; Rogers 1992; Williams 1990). Wealth is likewise protective of health, as it influences

access to medical care, and reduces stress and anxiety; it is positively associated with self-rated health, and negatively associated with chronic conditions, functional limitations, and mortality (Bond et al. 2003; Smith 1999).

Overall, a positive association between material resources and health is well established; the SES gradient in health is largest at lower levels of SES—indicating diminishing returns of SES for health at higher levels of SES (Mirowsky and Hu 1996; Smith and Kington 1997). It is important to note that the SES-health relationship is bidirectional, but the majority of the effect appears to be from SES to health (Doornbos and Kromhout 1990; House, Lantz, Herd 2005). Link and Phelan (1995) have cogently argued for conceptualizing SES as a 'fundamental cause' of disease and have outlined a number of mechanisms through which low SES results in poorer health, including SES differences in 1) risk behaviors, 2) access to health care and nutritious foods, 3) exposure to stressful life events, and 4) exposure to toxic substances.

Blacks and Hispanics are disadvantaged relative to Whites on a wide array of SES factors. Compared to Whites, Blacks and Hispanics have lower educational attainment (U.S. Department of Education 2000), are less likely to have upper-white collar jobs (Fronczek & Johnson 2003), have lower household earnings (U.S. Census Bureau 2004), possess far less wealth (Smith 1995), have limited access to health care as a result of lower rates of health insurance coverage (Gould 2006), and receive inferior health care even among medicare beneficiaries (Fiscella et al. 2000; McBean and Gornick 1994).

Importantly, a number of high-quality life course studies show that racial/ethnic socioeconomic disadvantages explain racial/ethnic health disparities (e.g., Bond et al. 2003; Farmer and Ferraro 2005; Rogers 1992; Shoenbaum and Waidmann 1997; Warner and

Hayward 2006; Williams and Collins 1995). However, this issue remains unsettled, as other studies suggest that SES disadvantages account for racial/ethnic health disparities for some, but not all health conditions (Hayward, et al. 2000; Mutchler and Burr 1991). Interestingly, Farmer and Ferraro (2005) show that SES is protective for both Whites and Blacks, but Blacks are more likely than Whites to experience diminishing returns of SES. Overall, previous research suggests that racial/ethnic SES stratification accounts for much, but perhaps not all of racial disparities in health.

Family, behavioral, and societal factors may also contribute to health disparities. In light of the well-documented health benefits of marriage (Ross, Mirowsky and Goldsteen 1990; Umberson 1987; Waite 1995), racial differences in marital patterns (Cherlin 1992) may exacerbate health disparities. Further, racial/ethnic differences in health behaviors such as smoking, heavy drinking, and obesity (Farmer and Ferraro, 2005; Schoenbaum and Waidmann 1997) may contribute to health disparities. Additionally, research suggests that minorities' higher levels of perceived discrimination result in elevated levels of stress and lead to health disparities (Geronimous 1996; Hummer 1996; Williams 2005).

Although research has shown that racial/ethnic health disparities largely stem from socioeconomic disadvantages, it remains unclear the degree to which life course factors (e.g., social origins, adult SES, family, and health behaviors) explain racial/ethnic differences in health intercepts and slopes. Accounting for racial/ethnic differences in a wide array of life course circumstances is hypothesized to reduce or eliminate disparities in health trajectories. That is, including these factors in regression analyses should, at a minimum, narrow the minority-White health trajectory gap.

Data and Methods

Sample

Data from waves 1 through 7 of the Health and Retirement Study (HRS) are utilized. The target population for the HRS includes all English or Spanish-speaking adults in the contiguous United States, aged 51-61 in 1992 (spouses of respondents were interviewed regardless of age-eligibility), who reside in households. Respondents were re-interviewed in 1994, 1996, 1998, 2000, 2002, and 2004. Blacks and Hispanics were oversampled to allow independent analysis of racial groups. Only a minor proportion of individuals are institutionalized at the target ages of this study; respondents remain in the study in the event that they are institutionalized between 1992 and 2004. Nonetheless, levels of morbidity and disability may be somewhat understated given the exclusion of institutionalized populations at baseline. Analyses are based on 9,363 Black, Hispanic and White respondents aged 51 to 61 in 1992. Other racial/ethnic groups are excluded due to very small sample sizes.

Measures

Dependent Variables

Serious chronic conditions. Respondent answered the question, "Has a doctor ever told you that you have (had a) [condition]." Serious conditions examined in this study include cancer, chronic lung disease, diabetes, heart disease, hypertension, and stroke. A summary measure of the total number of the above conditions ever diagnosed was constructed, ranging between 0 and 5.

Functional limitations. Respondents were asked whether they had some difficulty performing a set of tasks including walking several blocks, sitting for two hours, getting up from a chair after having sat for a while, climbing several flights of stairs, climbing a single

flight of stairs, stooping, kneeling, or crouching, lifting or carrying 10 lbs, picking up a dime off of a table, raising one's arms above one's shoulders, pushing or pulling large objects such as furniture. A summary measure of the total number of limitations ranging from 0-10 was constructed. Though measures of activities of daily living (ADLs) and Instrumental activities of daily living (IADLs) are commonly used, these were not selected because they tend to detect more severe levels of disability, which are rare for adults in their fifties and sixties.

Demographic Variables

Three dummy variables index *race/ethnicity:* White (omitted), Black, and Hispanic. Individuals are classified as Hispanic if they report being Hispanic on a question concerning one's ethnicity. Respondents are considered White if they do not report Hispanic ethnicity and report being White; similarly, individuals are classified as being Black if they report being Black and non-Hispanic. *Gender* is measured by a dummy variable (1=female; 0=male). Both *age* and age^2 are included in the analysis to capture health changes with age.

Social Origins

A substantial body of literature has documented a link between disadvantage in early-life and poor health in later-life (Ben-Shlomo and Kuh 2002; Elo and Preston 1992; O'Rand and Hamil-Luker 2005). Childhood SES measures include indicators of, *whether the family was poor,* and the respondents' father's *and mother's educational attainment* (less than high school=1; 0 otherwise)

Socioeconomic Variables

Adult SES indicators include respondent's *educational attainment* (in years)*, logged household earnings* (includes monies from wages and salaries for both spouses in the case of

marriage), *logged household social security income*, and *logged net worth* (total assets – total liabilities), and *health insurance coverage*.

Health Behaviors

Indicators of respondents' health behaviors include measures of *obesity* (1= BMI >30; 0=otherwise), *smoking history* (1=ever smoked; 0=otherwise), whether they *currently smoke*, and whether they *drink heavily* (1= 3+ drinks/day; 0=otherwise).

Family and Regional Context

Marriage is known to be protective of health (Umberson 1987; Williams and Umberson 2004) and vary by race/ethnicity (Cherlin 1992), therefore, a dummy variable for *marital status* (unmarried=1; 0 otherwise). A series of dummy variables indicate the region in which respondents currently reside (e.g., Northeast (ref.), Mid West, South, or West).

Analytic Strategy

Developmental and life course theory posit age as the appropriate metric in the study of health changes. However, the HRS is organized by wave, not by age. Due to considerable age heterogeneity within each wave of the HRS (a range of 11 years), it was necessary to reorganize the data from wave to age in order to accurately test the hypotheses. This transformation is referred to as an accelerated longitudinal design, which is commonly used in developmental, survey research (see Herd 2007; Yang 2007).

Random coefficient growth curves were modeled within a mixed model (i.e., hierarchical linear model) framework to investigate racial/ethnic differences in health trajectories between the ages of 51 and 73. These models are well-suited for the assessment

of individual change with age (Raudenbush and Byrk 2002). A hierarchical strategy is used, where repeated observations (Level 1) are nested within respondents (Level 2).

The growth curve models generate individual trajectories that are based on estimates of person-specific intercepts (initial value) and slopes (rate of change) that describe intra-individual patterns of change in health as a function of age. Comparisons of nested likelihood ratio tests (LRTs) of various shapes of health trajectories (e.g. linear, quadratic or cubic models), suggested that a quadratic growth curve with random intercepts and random linear and quadratic age slopes provided the best fit to the data. After developing an accurate model of the unconditional trajectory, independent variables are added to the model in order to examine the extent to which they explain racial/ethnic disparities in health. To estimate the effects of the covariates on the trajectory slope, interactions between the independent variables and age are included. For the sake of parsimony and to minimize the problem of collinearity, interactions between covariates and age^2 are included only when they are statistically significant or improve model fit. All variables are time-varying except measures of demographics, social origins, and smoking history. When independent variables are not mean-centered, the fixed effects of age and age^2 represent the trajectory shape for respondents with values of zero on all covariates; however, when independent variables are mean-centered, the fixed effects of age and age^2 represent the mean trajectory shape for individuals with average values on the continuous measures and zero values on the dummy variables, which is more substantively interesting (Singer and Willett 2003). Covariates variables are mean-centered to facilitate model interpretation.

Over the survey period, 15% of the sample (1,382) died and 16% were lost to follow-up (1,453 cases). Supplemental analyses showed that, compared to Whites, Blacks were 1.85

times as likely to die, while Hispanics were .91 times as likely to attrit due to death. There is no evidence of racial/ethnic differences in loss to follow-up. Ancillary tests showed that respondents who died had worse health at baseline and steeper health declines (attrition due to other causes was unrelated to health trajectories). Given racial/ethnic difference in rates of death and the fact that respondents who died experienced more rapid health deterioration, conventional methods that incorporate only respondents with complete cases lead to biased estimates of disparities in health trajectories. Specifically, due to mortality selection, these methods are likely to underestimate Black-White disparities, and may overestimate Hispanic-White differences.

To avoid such biases, this study utilizes hierarchical linear models in tandem with maximum likelihood estimation, which has the advantage of being able to incorporate all respondents who have been observed at least once including those who die (or attrit for other reasons) during the observation period in the sample, and is consistent with the approaches of recent high-quality studies on disparities in health trajectories (see Herd 2007; Taylor 2008; Yang 2007). Under these circumstances, Raudenbush and Bryk (2002) note that 1) the data may be assumed to be missing at random (MAR), meaning that the probability of missing a time point is independent of missing data given the observed data, and 2) this is a reasonable assumption when the observed data include variables related to both missingness and the dependent variable. Assuming the data are MAR, because all of the data are used in the analysis and a fully efficient estimation procedure (maximum likelihood) is utilized, estimates from the growth curve models are asymptotically unbiased (Raudenbush and Bryk, 2002).

Furthermore, to account for racial/ethnic differences in attrition, an indicator of the

number of waves contributed is included in the models. Supplemental analyses showed that results were robust to the inclusion of a dummy indicator of prospective mortality, as well the exclusion of those who attrited. Neither of these adjustments resulted in appreciable changes in the size or significance of the race/ethnicity effects, therefore, they are not presented. In addition, ancillary analyses showed no evidence of cohort differences, likely owing to the relatively narrow cohort range (1931-41).

Although one could argue that the independent variables should be lagged such that the dependent variable at wave t is predicted by the covariates at wave t-1, the focus of this study is not on establishing a causal relationship between the time-varying covariates and health, but rather on determining the extent to which racial/ethnic differences in life course factors mediate racial/ethnic inequalities in health trajectories. For this reason and the fact that lagging the independent variables reduces the sample size by more than 15%, the independent and dependent variables are modeled concurrently. Importantly, ancillary analyses (not shown) reveal that results are findings from this study are robust after lagging the covariates.

Results

Chronic Condition Trajectories

Table 4.2 presents random coefficient growth model estimates of trajectories of serious chronic conditions between ages 51 and 73. Estimates show that, on average, Whites have .396 conditions at age 51 and that their number of conditions increase with age at an accelerating rate, indicated by the significant, positive coefficients for both the linear and quadratic slopes. On the on hand, results suggest that Hispanics and Whites actually have similar levels and rates of change in chronic conditions. Blacks, on the other hand, have very

different chronic condition intercepts and slopes than White (and Hispanics). At age 51, Blacks have .234 more conditions than Whites and that gap increases with age at a decelerating rate, and ultimately, begins to shrink, as evidenced by the significant and positive Black × linear and negative Black × quadratic coefficients.

The shape of the trajectories and size of the racial/ethnic inequalities in intra-individual changes in chronic conditions are revealed in Figure 4.1, showing simulated trajectories of comorbidity by race/ethnicity. These simulations are based on the coefficient estimates in Table 4.2. Hispanics and Whites follow have similar chronic condition trajectories. Blacks, however, have .23 more health conditions than Whites at age 51, and the Black-White gap increases rapidly until it peaks at age 62 at .41, before subsiding to .27 by age 73. Interestingly, while the diverging chronic condition trajectories of Blacks and Whites between the ages of 51 and 62 are consistent with processes of cumulative disadvantage, the convergence of their trajectories between ages 63 and 73 supports an aging-as-leveler argument. Regardless, results show that Black-White disparities in comorbidity are substantial over the entire period.

Model 2 adds controls for social origins, human capital, adult SES, marriage, health behaviors, and region. Hispanic and White households continue to have similar chronic conditions trajectories, net of life course capital. Surprisingly, controlling for Blacks' disadvantages in life course capital only reduces the Black-White gap in chronic condition intercepts by 17% (from .23 to .19), and does not appreciably diminish differences in their chronic condition slopes. Figure 4.2 shows that, even after controlling for an array of life course factors, there are residual racial differences in chronic condition trajectories (see Hayward et al., 2000).

Functional Limitation Trajectories

Growth curve models of functional limitation trajectories are presented in Table 4.3. On average, Whites have 1.207 functional limitations at age 51 and that they accumulate more functional limitations with age at an accelerating rate, indicated by the significant, positive coefficients for both their linear (.058) and quadratic (.001) slopes. Compared to Whites, Hispanics and Blacks have functional limitation intercepts that are .738 and .749 higher, respectively. The non-significance of the interaction between race/ethnicity and the linear slope suggests that there are no racial/ethnic differences in intra-individual rates of change in functional limitations between ages 51 and 73. Supplemental analyses revealed that the coefficients for interactions between race/ethnicity and the quadratic slope terms were not statistically significant and did not improve model fit, therefore, those terms are not included in the models. Figure 4.3 shows the shape of the trajectories of functional limitations and the magnitude of the racial/ethnic disparities. These simulations are based on the coefficient estimates in Model 1 of Table 4.3. All racial/ethnic groups exhibit curvilinear increases in functional limitations between ages 51 and 73. Though Hispanics and Blacks have higher intercepts than Whites, they all have parallel slopes. Consistent with the status maintenance hypothesis, Hispanics and Blacks have worse functional health than Whites and the health gaps are constant between mid- and late-life.

Model 2 of Table 4.3 includes measures of social origins. Results suggest that while being poor as a child is associated with higher levels of functional limitations, having parents with greater than a high school education is protective of functional health. Accounting for racial/ethnic differences in social origins reduces the Hispanics' and Blacks' elevated levels

of functional limitations by 23% (from .738 to .568) and 26% (from .749 to .555), respectively.

Measures of human capital and adult socioeconomic status are included in Model 3 of Table 4.3. Education, income, and wealth are found to be significant predictors of functional health trajectories. Controlling for racial/ethnic inequalities in SES completely eliminates Hispanics excess functional limitations, relative to Whites, and it reduces Blacks' elevated functional health intercepts by 60% (from .749 to .297), consistent with prior research showing that racial/ethic health disparities stem, at least in-part, from socioeconomic inequalities (Bond et al. 2003; Farmer and Ferraro, 2005; Warner and Hayward, 2006; Williams and Collins 1995). Supplemental analyses (not shown) indicated that racial/ethnic differences in education and wealth are particularly central to explaining health disparities.

Model 4 of Table 4.3 adds proxies for health behaviors to the base model. Obesity, heavy drinking and a history of smoking are associated with poorer functional health trajectories. Including indicators of health behaviors does not significantly improve the health of minorities, relative to Whites, suggesting that these health behaviors are not responsible for racial/ethnic disparities in functional health. Marital status and region are included in Model 5 of Table 4.3. Being unmarried is associated with worse functional health, consistent with prior research showing that marriage is protective of health (Umberson 1987; Williams and Umberson 2004). However, marital status and region do not appear to mediate the race/ethnicity effects on functional limitations.

Model 6 of Table 4.3 is the full model, which includes measures of social origins, human capital, SES, health behaviors, social capital and region. As hypothesized, accounting

for racial/ethnic differences in life course capital completely eliminates the Hispanic-White gap, and reduces the Black-White gap by 75% (from .749 to .186).

Discussion

Increasing quality and years of healthy life, and eliminating health disparities are primary goals of *Health People 2010*, a comprehensive, nationwide health promotion and disease prevention agenda. To achieve these goals, it is necessary to understand patterns of intra-individual changes in health with age, and how these processes differ across racial/ethnic groups. Though racial/ethnic disparities in *levels* of physical and functional health are well-documented, less is known about racial/ethnic differences in functional limitation and chronic condition ag*e-trajectories* (i.e., long-term, intra-individual rates of stability and change in health with age). This study is among the first to both conceptualize and measure age-trajectories of health for Blacks, Hispanics, and Whites.

Findings indicate that there are dramatic racial/ethnic disparities in health trajectories. While status leveling, status maintenance, and cumulative disadvantage theories are often framed as competing perspectives, there is evidence that supports all three, depending on the health outcome and life stage being analyzed. For example, Black-White disparities in serious chronic conditions increase during the fifties and early- sixties, followed by decreasing health inequalities through the early seventies. These results are consistent with cumulative advantage/disadvantage and weathering processes, as well as the argument that Whites are able to compress their morbidity until later stages of life, effectively delaying, but not forgoing precipitous declines in health. Importantly, these patterns were not detected in the initial trajectory models that were based on survey wave instead of age, which indicated that the health gap was constant between waves 1 and 7, underscoring the utility of age-based

models for understanding intracohort inequality dynamics. Wave-based analyses with substantial age heterogeneity obscure racial/ethnic differences in health trajectories when disparities have a non-linear relationship with age.

Hispanics and Whites appear to follow similar morbidity trajectories, having comparable levels and rates of change in their number of serious chronic conditions. Also, Hispanics actually have lower risks of death than Whites. Findings that Hispanics have comparable morbidity trajectories and lower mortality rates than Whites are consistent with previous research documenting the 'Hispanic paradox', whereby Hispanics have surprisingly good health relative to Whites given their social and economic disadvantages. This paradox is frequently attributed to (a) health-promoting lifestyles of recent migrants (Abraido-Lanza et al. 1999), (b) healthy migrant selection effects (Landale et al. 2000), and (c) ill migrants returning home to sending countries (Markides and Coreil 1986). Future research should investigate the specific mechanisms that enable Hispanics to maintain relatively good physical health and low mortality rates despite disadvantaged circumstances.

In the case of functional limitations, results are congruent with the status maintenance hypothesis. Both Hispanics and Blacks have more functional limitations than Whites at 51, and all three groups follow parallel trajectories through their early 70s, such that the health disparities are neither accentuated nor abated with age. Mortality rates over the observation period also varied by race/ethnicity. Blacks had the highest rates of death, followed by Whites and then Hispanics, consistent findings from previous studies (Elo and Preston 1997; Markides et al. 1997; National Center for Health Statistics 2003). Importantly, results presented here are robust to controls for mortality and loss to follow-up during the observation period. However, left-censoring may be an issue. Given that inclusion in the

HRS sample is conditional upon survival to age 51, and the fact that minorities are less likely than Whites to survive until mid-life due because they have higher mortality rates prior to mid-life, the results presented here may actually understate racial/ethnic health disparities. Therefore, findings should be interpreted as conditional on survival to mid-life.

The lives of White, Black, and Hispanic Americans evolve in very different ways with respect to risk factors for chronic conditions and functional limitations. Minorities are disadvantaged in terms of social origins, education, income, wealth, social support, health behaviors, and access to care. The present study draws on life course themes in the status attainment tradition, which highlight how one's social origins and structural position in social and economic institutions influence attainment processes and an array of subsequent life chances and outcomes (Blau and Duncan 1967; Teachman 1987). We find that various forms of life course capital are related to health in later-life, and that racial/ethnic inequalities in life course capital account for a portion of, but not all disparities in health trajectories. For example, SES in adulthood is, by far, the dominant mediator of racial/ethnic functional health disparities, followed by social origins, yet Blacks continue to have higher levels of functional disability after accounting for these factors. Moreover, only a small portion of Blacks' excess morbidity, compared to Whites', is explained by racial inequalities in life course capital.

The fact that disparities in functional and physical health are not eliminated after accounting for Blacks disadvantages in social origins, human capital, SES, marriage, and health behaviors, suggests that other factors such as racism and unequal exposure to stressors may play a major role. Indeed, subjective experiences of racism increase levels of stress and may increase risks for stress-related diseases and contribute to health disparities (Geronimus 1996; Harrell, et al. 2003; Williams et al. 2003). Also, Williams and Jackson (2005) argue

that racial residential segregation is a fundamental cause of health disparities because it leads to differential exposure to societal risks and resources. They note that minority neighborhoods are disadvantaged in terms of neighborhood safety, accessibility of recreational facilities, green spaces and healthy products in grocery stores, and marketing of tobacco and alcohol—all of which influence health behaviors (see also Cheadle et al. 1991; Moore, Williams and Qualls 1996; MMWR 1999; Williams and Collins 2001). Unfortunately the HRS does not have information on these factors, however, future research should investigate the role that racism and neighborhood context play in health disparities.

This study uses an index of serious chronic conditions because previous research has shown that this measure provides a more parsimonious approach to understanding broad dimensions of well-being than analyzing single items (Farmer and Ferraro 2005). In addition, analyses of summary health measures are less likely than those of binary outcomes to encounter issues such as insufficient statistical power (Ferraro and Wilmoth 2000). That said, health conditions differ in terms of their etiology, and race/ethnicity and social factors are likely to influence the trajectories of distinct diseases differently. Indeed, supplemental analyses of trajectories of specific health problems (not shown) indicated that some disorders followed patterns consistent with the weathering hypothesis, while others were consistent with leveling or status maintenance perspectives. Thus, future research should examine racial/ethnic differences in trajectories of specific diseases.

We utilized an aggregate approach to investigate racial/ethnic differences in *average* health trajectory intercepts and/or slopes. By contrast, the disaggregated approach is well-suited to determine whether there are racial/ethnic disparities in the risks of following *distinct classes of health trajectories* (George 2003; Nagin 2005). Previous studies using a

disaggregate/group-based approach to trajectories have identified a number of qualitatively distinct trajectories of health (e.g., constant good health, constant poor health, linear decline, precipitous decline, and decline and recovery) within the population (e.g., Clipp et al. 1992; Hamil-Luker and O'Rand 2007; O'Rand and Hamil-Luker 2005). Future research is needed on whether there are racial/ethnic differences in the likelihood of following specific classes of health trajectories.

This study did not find evidence of cohort differences in racial/ethnic inequalities in health trajectories. This may be due to the fact that we analyzed a relatively narrow range of birth cohorts (1931-41). Levels of educational attainment among minorities have increased over the 20th century, and their educational outcomes, relative to Whites, have improved among more recent cohorts. Given the strong link between education and health, one might expect racial/ethnic health disparities to decline among successive cohorts. Future research should investigate whether health trajectory inequalities differ across cohorts. The HRS would be ideal for such as study because it has high-quality health information on birth cohorts between 1890 and 1953.

Empirical studies of racial/ethnic differences in health trajectories continue to lag behind theories on the matter. Aspects of temporality have been neglected in research on health disparities. Greater attention to racial/ethnic inequalities in intra-individual health changes is warranted. We find that Blacks, Hispanics and Whites differ in terms of their health levels and rates of change. Importantly, dramatic health disparities between Blacks and Whites tend to emerge by the early 50s. To better understand and eliminate health disparities, future research should investigate racial/ethnic differences in health trajectories and the mechanisms responsible for them at earlier life stages.

Table 4.1 Weighted Baseline Descriptive Statistics

Variables	Whites	Blacks	Hispanics
Number of serious conditions	0.56	0.91	0.563
Number of functional limiations	1.93	2.83	2.84
Female[ab]	51.22	57.70	54.15
Poor family[ab]	23.52	31.34	33.57
Mother had < H.S. Education[ab]	58.99	81.31	91.11
Father had < H.S. Education[ab]	64.38	83.60	87.60
Years of Education[ab]	12.66	11.21	8.40
Ln Earnings[ab]	9.28	7.84	7.82
Ln Social Security Income[ab]	1.29	1.81	1.68
Ln Net worth[ab]	11.27	7.08	8.51
Uninsured[ab]	13.29	21.04	39.42
Obese[ab]	20.85	34.54	27.95
Ever smoked[b]	65.0	62.93	56.26
Currently smoke[ab]	26.91	30.20	23.39
Heavy drinker	5.41	5.18	4.80
Unmarried[ab]	20.64	48.16	29.36
Midwest[ab]	28.02	18.63	4.80
West[ab]	15.05	5.85	38.60
South[ab]	38.66	54.07	45.50
N	6855	1659	855

[a] White-Black difference is statistically significant at .05 level

[b] White-Hispanic difference is statistically significant at .05 level

Table 4.2 Chronic Condition Trajectories between Ages 51 and 73; Growth Curve Models

		Model 1	Model 2
Fixed Effects			
Initial status, π_{0i}	Intercept	0.396 ***	0.410 ***
	Black	0.235 ***	0.193 ***
	Hispanic	0.004	-0.042
	Female	0.049 **	0.052 **
	Poor during childhood		-0.003
	Mother had < H.S. Education		-0.087 *
	Father had < H.S. Education		-0.018
	Years of Education		-0.005
	Earnings		-0.003 *
	Social Security Income		0.015 ***
	Net Worth		-0.002
	Uninsured		-0.001
	Obese		-0.029 *
	Ever smoked		0.105 ***
	Currently smoke		-0.113 ***
	Heavy Drinker		0.023
	Unmarried		0.031 *
	Mid-West		-0.004
	West		-0.001
	South		-0.020
	Number of waves	-0.039 ***	-0.041 ***
Rate of linear change, π_{1i}	Intercept	0.023 ***	0.021 ***
	Black	0.025 ***	0.024 ***
	Hispanic	0.001	-0.002
	Female	-0.010 ***	-0.009 ***
	Poor during childhood		0.004 *
	Mother had < H.S. Education		-0.003
	Father had < H.S. Education		0.004
	Years of Education		-0.001 ***
	Earnings		-0.001
	Social Security Income		-0.002 ***
	Net Worth		0.001
	Uninsured		-0.002 +
	Obese		0.004 ***
	Ever smoked		0.004 *
	Currently smoke		-0.003 *
	Heavy Drinker		-0.004
	Unmarried		-0.002
	Mid-West		0.001
	West		-0.004
	South		0.003
	Number of waves	-0.005 ***	-0.007 ***
Rate of quadratic change, π_{2i}	Intercept	0.002 ***	0.002 ***
	Black	-0.001 ***	-0.001 ***
	Hispanic	0.001	0.001
Random Effects			
	Level 1 Residual	0.254 ***	0.254 ***
	Level 2 Age	0.130 ***	0.128 ***
	Level 2 Age^2	0.006 ***	0.006 ***
	Level 2 Intercept	0.768 ***	0.754 ***
	N	9369	9369
	Log Likelihood	-31879	-31474

+p <.1; *p<.05; **p<.01; ***p<.001

Figure 4.1 Chronic Condition Trajectories (Model 1)

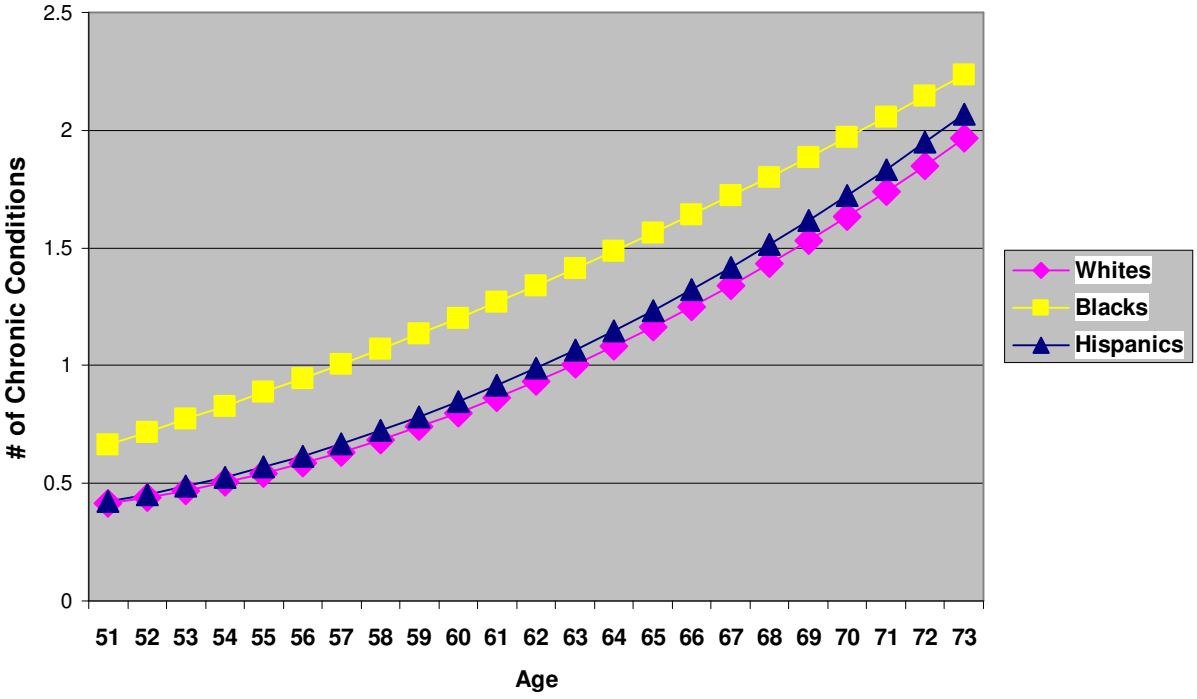


Figure 4.2 Chronic Condition Trajectories (Model 2)

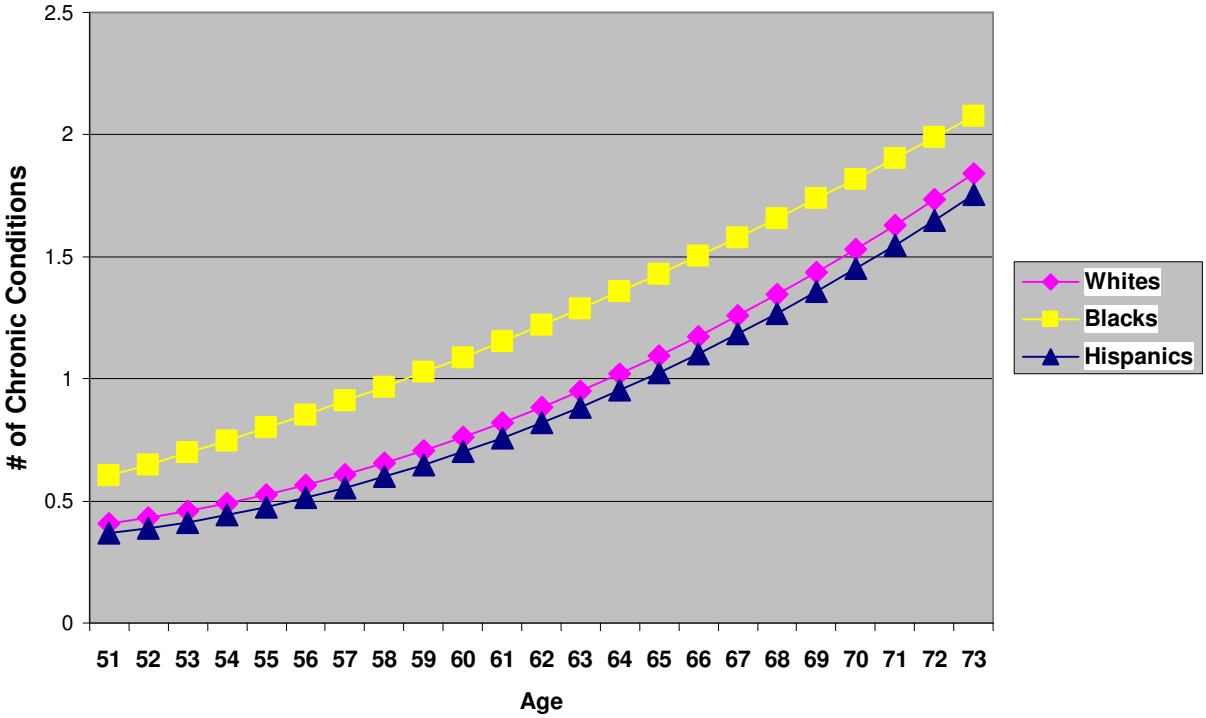


Table 4.3 Functional Limitation Trajectories; Growth Curve Models

		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Fixed Effects							
Initial status, π_{0i}	Intercept	1.207 ***	1.109 ***	1.932 ***	0.708 ***	1.188 ***	1.414 ***
	Black	0.749 ***	0.555 ***	0.297 ***	0.726 ***	0.672 ***	0.186 *
	Hispanic	0.738 ***	0.568 ***	-0.110	0.764 ***	0.742 ***	-0.074
	Female	0.891 ***	0.907 ***	0.680 +	1.022 ***	0.853 ***	0.766 ***
	Poor during childhood		0.502 ***				0.307 ***
	Mother had < H.S. Education		-0.363 **				-0.079
	Father had < H.S. Education		-0.426 ***				-0.164
	Years of Education			-0.152 ***			-0.130 ***
	Earnings			-0.061 ***			-0.059 ***
	Social Security Income			0.134 ***			0.139 ***
	Net Worth			-0.039 ***			-0.036 ***
	Uninsured			-0.091			-0.074
	Obese				0.291 ***		0.277 ***
	Ever smoked				0.601 ***		0.484 ***
	Currently smoke				-0.126 +		-0.185 **
	Heavy Drinker				0.338 *		0.242 +
	Unmarried					0.300 ***	0.20 **
	Mid-West					0.019	0.020
	West					-0.081	-0.017
	South					-0.035	-0.117
	Number of waves	-0.124 ***	-0.130 ***	-0.080 *	-0.115 ***	-0.118 ***	-0.068 +
Rate of linear change, π_{1i}	Intercept	0.058 ***	0.062 ***	0.045 ***	0.050 ***	0.048 ***	0.031 *
	Black	-0.002	0.001	0.003	-0.004	-0.002	0.002
	Hispanic	-0.016	-0.015	-0.017	-0.018 +	-0.018 +	-0.021 +
	Female	-0.002	-0.001	0.007	-0.001	-0.001	0.009
	Poor during childhood		-0.001				0.0
	Mother had < H.S. Education		-0.006				-0.007
	Father had < H.S. Education		0.005				0.008
	Years of Education			-0.002 *			-0.002 +
	Earnings			0.003 ***			0.003 ***
	Social Security Income			-0.018 ***			-0.019 ***
	Net Worth			0.0			0.0
	Uninsured			0.001			0.0
	Obese				0.013 *		0.013 *
	Ever smoked				0.001		0.003
	Currently smoke				0.001		0.003
	Heavy Drinker				0.004		0.005
	Unmarried					-0.011 +	-0.006
	Mid-West					0.003	0.003
	West					0.009	0.014
	South					0.022 **	0.025 **
	Number of waves	-0.012 ***	-0.016 ***	-0.011 ***	-0.012 ***	-0.012 ***	-0.017 **
Rate of quadratic change, π_{2i}	Intercept	0.001 ***	0.002 ***	0.002 ***	0.002 ***	0.002 ***	0.002 ***
Random Effects							
	Level 1 Residual	1.413 ***	1.413 ***	1.417 ***	1.413 ***	1.414 ***	1.417 ***
	Level 2 Age	0.236 ***	0.235 ***	0.236 ***	0.239 ***	0.234 ***	0.238 ***
	Level 2 Age^2	0.011 ***	0.011 ***	0.011 ***	0.011 ***	0.011 ***	0.011 ***
	Level 2 Intercept	2.206 ***	2.189 ***	1.922 ***	2.181 ***	2.196 ***	1.897 ***
	N	8885	8885	8885	8885	8885	8885
	Log Likelihood	-93022	-92920	-92430	-92319	-92996	-91697

+p < 1; *p<.05; **p<.01; ***p<.001

Figure 4.3 Functional Limitation Trajectories between Ages 51 and 73 (Model 1)

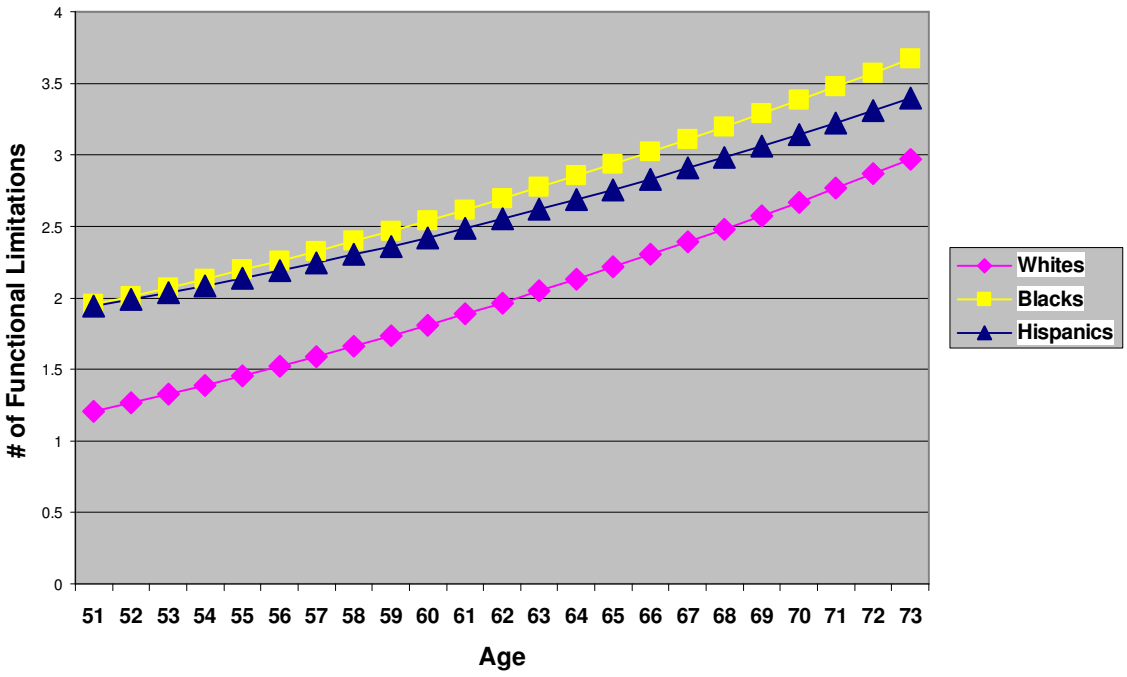
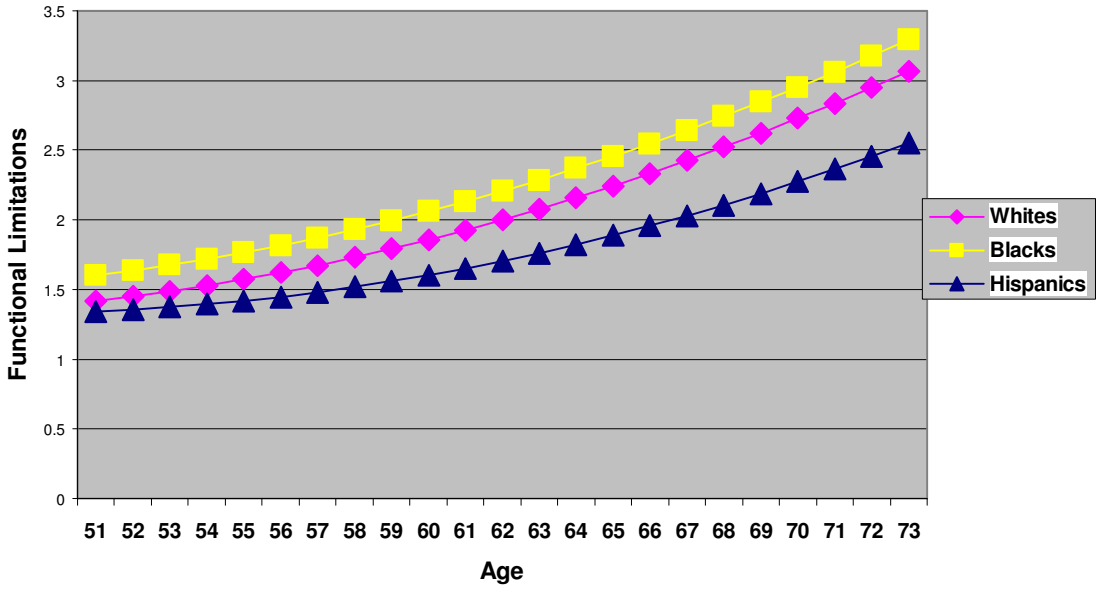


Figure 4.4 Functional Limitation Trajectories between Ages 51 and 73 (Model 2)



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Chapter 5: Conclusion

Nearly a half century since the passage of landmark civil rights legislation, striking racial/ethnic inequalities in wealth and health persist in the U.S. Racial/ethnic differences in wealth are enormous. The median net worth of Black and Hispanic households is less than 10% of their White counterparts. Furthermore, Hispanics and Blacks are more than twice as likely as Whites to have zero or negative wealth (Kochar 2004). Racial/ethnic health disparities are also striking. While the health of older Americans, as a whole, is improving racial/ethnic health disparities do not appear to be narrowing over time (Martin et al. 2007). Extensive empirical research shows that minorities experience poorer health than Whites on a wide array of indicators including self-rated health, chronic conditions and functional limitations (Elo and Preston 1997; Kelley- Moore and Ferraro 2004; Manton and Gu 2001; Markides et al., 1997; Williams, 2005). Moreover, compared to Whites, Blacks have higher mortality rates and shorter life-expectancies (NCHS 2003). Unfortunately, much of the extant research on wealth and health inequalities has been overly static, largely ignoring the fluid nature of wealth and health over the life course. Though racial/ethnic inequalities wealth and health *levels* have been well-documented over the last two decades, relatively little is known about how wealth and health *trajectories* (i.e., long-term, intraindividual changes in wealth and health) vary by race/ethnicity. Thus, it remains unclear how these disparities evolve over the life course.

Most of the research on racial/ethnic inequalities in wealth and health in the economic, sociological and public health literatures has focused on the analysis of between-

person differences. Contrasting this, is the life course perspective which is primarily focused on explaining long-term, within-person patterns of stability and change (Elder 1998). Whereas, a between-person approach could be used to examine racial/ethnic differences in wealth and health, a within-person design would focus on patterns of intraindividual changes in wealth and health with age. Importantly, this dissertation is unique in that it simultaneously utilizes both between- and within-person approaches to investigate racial/ethnic differences in intraindividual changes in wealth and health across the life course. Cross-fertilization of life course perspectives and analyses with conventional social science approaches has considerable utility for explaining diverse aging experiences (George 2008).

Wealth accumulation and health decline/improvement are dynamic processes that occur over the life course yet much of the existing research on racial/ethnic inequalities wealth and health has been largely atemporal, using research designs that are ill-suited to capture diverse life course processes. Specifically, an understanding of racial/ethnic differences in wealth and health trajectories has been hindered by several temporal limitations common to the literature. First, much of the research has been based on cross-sectional designs. Second, even among longitudinal studies, most examine changes (or transitions) between only two time points. Third, many explore transitions over relatively short periods. Fourth, inattention has been given to issues of selective survival, which may bias estimates. Fifth, the vast majority of longitudinal studies model change as a function of time rather than age.

By using life course perspectives and methods to investigate racial/ethnic differences in wealth and health trajectories, this study extends previous research in several respects.

First, this study utilizes two high-quality, longitudinal datasets (NLSY and HRS). Second, racial/ethnic differences in intraindividual changes in wealth and health on numerous occasions are investigated. Third, I estimate long-term trajectories. Fourth, respondents who attrit are included in the analyses. And fifth, intraindividual change is modeled as a function of age instead of time, consistent with life course theory (e.g., aging-as-leveler, status maintenance, cumulative disadvantage and life cycle hypotheses). This study is among the first to both conceptualize and model wealth and health trajectories as dynamic life course processes.

Three competing hypotheses are explicitly tested in this study on racial/ethnic differences in wealth and health trajectories. The aging-as-leveler hypothesis posits that racial/ethnic disparities in wealth and health should attenuate with age (see Dowd and Bengtson 1978). The status maintenance hypothesis asserts that racial/ethnic inequalities in wealth and health remain stable with age (Henretta and Campbell 1976). Alternatively, the cumulative advantage/disadvantage hypothesis posits that intracohort inequality increases as the cohort ages (Dannefer 1987; 2003; Ferraro and Farmer 1996; O'Rand 1996), suggesting that racial/ethnic inequalities in wealth and health are likely to increase with age.

In chapter 2, I investigated how the process of wealth accumulation varies by race/ethnicity between early and middle adulthood. In addition, I assessed the extent to which racial/ethnic differences in various forms of life course capital (i.e., social origins, education, earnings, inheritances, family patterns, local unemployment rate and region) account for racial/ethnic disparities in wealth trajectories. Panel data from the NLSY, a nationally representative survey, and random coefficient growth curve models were utilized to examine racial/ethnic differences in wealth trajectories between ages 21 and 45. On the whole, results

are consistent with the cumulative disadvantage hypothesis: relatively small wealth gaps between Whites, Blacks and Hispanics exist in their early 20s, but these initial inequalities are magnified with age, resulting in enormous wealth gaps by midlife.

Chapter 3 examined racial/ethnic differences in wealth trajectories during the transition from mid- to late-life. This chapter used data from the HRS, a nationally representative, longitudinal dataset that oversampled Blacks and Hispanics, in tandem with growth curve models to estimate racial/ethnic differences in wealth trajectories between ages 51 and 73. Findings show that wealth trajectories vary dramatically by race/ethnicity. By midlife, large disparities in net worth and net financial assets have emerged. Moreover, consistent with a process of cumulative disadvantage, White households experience more rapid rates of wealth accumulation during their 50s and 60s than Black and Hispanic households, leading to increasing wealth disparities with age.

Because longitudinal studies began collecting detailed information on wealth holdings in the 1980s, data on intra-individual changes in wealth across the entire adult lifespan does not exist. Should the NLSY continue collecting wealth information on baby boomers into their retirement years, it would be become an ideal source for such a study because it would have wealth measures on respondents dating back to their early 20s. In the absence of such data, linking the wealth trajectories from the NLSY and the HRS (spanning ages 21 to 45 and 51 to 73, respectively) represents the best alternative, notwithstanding limitations. Such an approach can be thought of as a cohort-sequential or accelerated longitudinal design whereby several cohorts of different ages are observed longitudinally for a shorter period of time than would be required if a single cohort were being analyzed (Collins 2006). While the accelerated longitudinal design is economical in terms of time and

resources, it assumes that the cohorts have identical age-trajectories (Miyazaki and Raudenbush 2000). Nonetheless, as figures 5.1 and 5.2 illustrate, linking the results from the two datasets is informative. Collectively, results from the NLSY and HRS suggest that racial/ethnic wealth disparities increase exponentially between early adulthood and late-life. However, from the figure, it is apparent that the wealth of the baby boomers is greater than that of their parents' cohort, consistent with prior research (Keister and Deeb-Sossa 2000).

As the baby boom cohort approaches retirement age, issues of later-life economic security are increasingly important. Additionally, research on the relative well-being of older racial and ethnic minorities is particularly important given the projected increases in the proportion of older Black and Hispanic Americans (U.S. Census 2004). Findings from this study suggest that, by midlife, whereas the average White baby boomer has amassed considerable wealth that will be able to be used as retirement income, Hispanics and Blacks have not. Many older adults, especially minorities, will be forced to rely exclusively on private pensions and social security income.

Both chapters 2 and 3 investigated the role that life course capital plays in mediating wealth disparities. The potential mediating factors examined were much more extensive, and spanned a longer period, than those of previous studies (e.g., Altonji and Doraszelski 2005; Gittleman and Wolff 2004). A range of indicators of life course capital were shown to be related to wealth accumulation including social origins, human capital, wages, social security income, financial transfers, health, family circumstances, and neighborhood context. However, these factors accounted for only a minor fraction of the minority-White wealth gaps. Even after controlling for racial/ethnic inequalities in life course capital, Hispanics and Blacks were at a major disadvantage, compared to Whites, both in terms of wealth levels and

wealth growth with age. Several potential explanations for the residual racial/ethnic wealth gaps are discussed below.

Oliver and Shapiro (1995) argue that wealth is the best indicator of the '*sedimentation of racial inequality'*, the notion that the cumulative impact of historical inequalities have anchored minorities to the bottom of societies' economic hierarchy, because it "captures the historical legacy of low wages, personal and organizational discrimination, and institutional racism"(p. 5). Because wealth is often passed on from one generation to another, it is cumulative in nature; thus, the wealth holdings of contemporary cohorts are shaped, in part, by historical injustices such as slavery, Jim Crow, discrimination, and segregation. Whereas, the paucity of resources of many minority households stems from cumulative disadvantages, the wealth of some White households are a consequence of cumulative advantages (Oliver and Shapiro, 1995) or unjust enrichment.

While beyond the scope of this study, the issue of whether subsequent cohorts of racial/ethnic minorities will fare better or worse than their predecessors is an empirical question that warrants attention. Findings from this study are not generalizable to more recent cohorts. However, given the absence of evidence of declining wealth inequalities across time (Kochar 2004), continued discrimination and residential segregation, and enduring racial/ethnic inequalities in social origins, and attainment processes, it seems plausible that racial/ethnic disparities in wealth are likely to persist into the foreseeable future.

The focus of this study is on comparing the average trajectories of different racial/ethnic groups; however, it is important to note that there is a great deal of heterogeneity and inequality within these groups as well. Although the average White household may have a relatively comfortable cushion of savings, many do not. Among

Whites, wealth is very unequally distributed. The wealthiest 25 percent own 79 percent of total wealth in White communities. Inequality is even higher among minorities where the top 25 percent own more than 90 percent of the total wealth (Kochar 2004). Future research should examine trends and determinants of wealth inequality within racial/ethnic groups.

In chapter 4, the focus shifts to examining racial/ethnic differences in health trajectories during the transition from mid- to late-life. Seven waves of panel data from the HRS and growth curve models are used to estimate health trajectories between ages 51 and 73. Findings indicate that there are dramatic racial/ethnic disparities in health trajectories. While status leveling, status maintenance, and cumulative disadvantage theories are often framed as competing perspectives, there is evidence to support all three, depending on the health outcome and life stage being analyzed.

Black-White disparities in serious chronic conditions increase during the 50s and early 60s, followed by decreasing health inequalities through the early 70s. Overall, these results are consistent with cumulative advantage/disadvantage and weathering processes, as well as the argument that Whites are able to compress their morbidity until later stages of life, effectively delaying, but not forgoing precipitous declines in health. Importantly, these patterns were not detected in the initial trajectory models that were based on survey waves instead of age, which indicated that the health gap was constant between waves 1 and 7, underscoring the utility of age-based models for understanding intracohort inequality dynamics. Wave-based analyses with substantial age heterogeneity obscure racial/ethnic differences in health trajectories when disparities have a non-linear relationship with age.

Given Hispanics' social and economic disadvantages compared to Whites one might expect them to be in poorer health than Whites, as is the case with Blacks. However, results

show that Hispanics and Whites have comparable morbidity trajectories, indicated by their similar chronic condition intercepts and slopes. In addition, Hispanics actually have lower mortality rates than Whites. Though these findings may seem counterintuitive, they are consistent a growing body of research documenting Hispanics' relatively low prevalence of morbidity and low mortality rates in spite of the disadvantages they face. Several explanations have been put forward to explain this phenomena know as the 'Hispanic paradox'. The cultural and social 'buffering' hypothesis posits that Hispanics have favorable health outcomes despite their disadvantaged backgrounds because of their positive health behaviors (i.e., Hispanics are less likely to smoke and drink alcohol than Whites) and stronger family support systems (Abraido-Lanza et al. 1999). Alternatively, the healthy migrant selection hypothesis asserts that migration is positively selective, with individuals who migrate to the U.S. representing a particularly robust sub-sample of the Hispanic population; thus, the Hispanic paradox is due to the especially good health of Hispanic immigrants (Landale, Oropesa and Gorman 2000). A third hypothesis, known as the 'salmon bias' posits that the relatively good health and low rates of adult mortality among Hispanics in the U.S. is due to the return migration of migrants in poor health. Previous research shows that accounting for return migration explains foreign-born Mexicans' health advantage over non-Hispanic Whites (Paloni and Arias 2004). While delineating the specific reasons for the relatively low prevalence of certain health problems in the Hispanic population is beyond the scope of this study, future research on this topic is needed.

In the case of functional limitations, results are consistent with the status maintenance hypothesis. Both Hispanics and Blacks have more functional limitations than Whites at 51, and all three groups follow parallel trajectories through their early 70s, such that the health

disparities are neither accentuated nor abated with age. Mortality rates over the observation period also varied by race/ethnicity. Blacks had the highest rates of death, followed by Whites and then Hispanics, consistent with findings from previous studies (Elo and Preston 1997; Markides et al. 1997; NCHS 2003). Because inclusion in the HRS sample is conditional upon survival to age 51, and the fact that minorities are less likely than Whites to survive until mid-life owing to their higher mortality rates prior to mid-life, the results presented here may underestimate racial/ethnic health disparities. Given that dramatic health disparities between minorities and Whites have already emerged by the early 50s, future research should investigate racial/ethnic differences in health trajectories and the mechanisms responsible for them at earlier life stages.

The lives of White, Black, and Hispanic Americans evolve in very different ways with respect to risk factors for chronic conditions and functional limitations. Minorities are disadvantaged in terms of social origins, education, income, wealth, social support, health behaviors, and access to care. Results reveal that various forms of life course capital are related to health in later-life, and that racial/ethnic inequalities in life course capital account for some, but not all disparities in health trajectories. For example, SES in adulthood is, by far, the dominant mediator of racial/ethnic functional health disparities, followed by social origins; however, Blacks continue to have higher levels of functional disability after accounting for these factors. Furthermore, only a small portion of Blacks' elevated rates of morbidity is explained by racial inequalities in life course capital.

That striking racial/ethnic disparities in wealth and health remain after accounting for racial/ethnic differences in a wide array of individual-level factors suggests that other levels of social context (i.e., family, peers, and neighborhood) may contribute to wealth and health

disparities. For example, racial/ethnic differences in social networks are likely to influence wealth inequalities, consistent with the life course principle of linked lives—lives are lived interdependently and socio-historical influences are expressed through this network of shared relationships (Elder 1998). The family and friends of Blacks and Hispanics are likely to be worse off economically than those of Whites, and in economically depressed communities there may be especially strong norms of social responsibility whereby prosperous individuals are expected to help those in need (Altonji and Doraszelski 2005; Chiteji and Hamilton 2002). In this way, the wealth accumulation of relatively high-earners in minority communities is diminished because discretionary income is transferred instead of invested or saved. Indeed, accounting for the racial differences in the economic situations of parents and siblings reduces the Black-White wealth gap by more than a quarter (Chiteji and Hamilton 2002). Racialized peer networks are also likely to lead to wealth inequalities. For instance, Mouw (2002) found that segregated job networks contribute to racial inequality in the labor market.

Furthermore, residential segregation plays a role in creating wealth inequality. Though declining recently, significant residential segregation along race/ethnicity persists in the U.S. (Glaeser and Vigdor 2001). Importantly, employment decentralization in tandem with residential segregation leads to racial/ethnic disparities in job opportunities (Carrington and Troske 1998; Kain 1968; Mouw 2000; Wilson 1987). Also, the racial/ethnic composition of a neighborhood has significant implications for housing appreciation rates. Homes in communities with a high proportion of racial/ethnic minorities, particularly Blacks, appreciate at a much lower rate than those in predominantly White neighborhoods (Flippen 2004). Given that home equity represents a substantial proportion of the net worth of most

households (Keister 2000), racial/ethnic differences in rates of home appreciation are likely a major source of the disparities in wealth trajectories documented in this study.

Racial/ethnic differences in community context may also contribute to health disparities. Over the past decade, a growing body of research has documented a strong link between neighborhood context and health outcomes (Entwisle 2007). Racial residential segregation contributes to health disparities because it leads to differential exposure to societal risks and resources (Williams and Jackson 2005). For example, minority neighborhoods are disadvantaged in terms of neighborhood safety, accessibility of recreational facilities, green spaces and healthy products in grocery stores, and marketing of tobacco and alcohol—all of which affect health (see also Cheadle et al. 1991; Moore, Williams and Qualls 1996; Williams and Collins 2001; Williams and Jackson 2005). In addition, racism and unequal exposure to stressors may lead to health disparities. Empirical evidence suggests that subjective experiences of racism increase levels of stress and may increase risks for stress-related diseases and contribute to health disparities (Geronimus 1996; Harrell, et al. 2003; Williams et al. 2003). Though investigating the dynamic roles of multiple levels of social context (e.g., individual, family, peer, and neighborhood) in contributing to wealth and health disparities is beyond the scope the this study due to data limitations, future research should examine how multiple levels of social context interact over time to shape wealth and health trajectories in general, and racial/ethnic disparities in particular.

This study utilized a summary measure of health (i.e., an index of serious chronic conditions) because previous research has shown that this measure provides a more parsimonious approach to understanding broad dimensions of well-being than analyzing

single items (Farmer and Ferraro 2005). However, health conditions differ in terms of their etiology, and race/ethnicity and social factors are likely to influence the trajectories of distinct diseases differently. Thus, future research should examine racial/ethnic differences in trajectories of specific diseases. Similarly, while this study used comprehensive measures of wealth (i.e., net worth and net financial assets), our understanding of wealth disparities may be aided by future research on racial/ethnic inequalities in the accumulation/decumulation of particular assets and liabilities (e.g., ownership and value of homes, stocks, bonds, IRAs, pensions and credit card debt). Racial/ethnic differences in home ownership and appreciation are expected to contribute substantially to the inequalities in wealth trajectories.

Though beyond the scope of this study, future research should investigate the nature of the health-wealth relationship. Health and wealth are known to be positively correlated: individuals with better health tend to have more wealth (Smith 1995). Yet, previous research has been unable to establish the causal effects of health on wealth and vice versa because much of the extant research has relied on cross-sectional data and methods to merely examine the association between health and wealth. Importantly, there are sound theoretical reasons to believe that the health-wealth relationship is reciprocal, with wealth influencing health and health affecting wealth (Smith 1999). A life course approach is needed to better understand the nature of the health-wealth link. For example, one could utilize dynamic longitudinal data and methods (e.g., growth curve models) to examine the short- and long-term impact of health shocks on wealth trajectories. Of course, the independent variable (i.e., health transitions) would need to be lagged in order to satisfy the requirement that the cause precede the effect. Additionally, given that wealth is a household-level measure, it would be

informative to employ couples models to examine the independent and joint effects of health transitions of both spouses/partners among the married or cohabiting.

Currently, credit scores have been understudied as a potential mechanism behind racial/ethnic inequalities in wealth accumulation. Credit scores have significant implications for one's ability to amass wealth. Lenders, such as banks and credit card companies use credit scores to determine who qualifies for a loan, at what interest rate, and what credit limits. Because negative credit information stays on file for up to seven year, financial mistakes can have long-lasting effects on financial well-being. Future research should a) investigate how credit histories vary by race/ethnicity across the life course, and b) examine the extent to which racial/ethnic differences in credit scores contribute to wealth disparities.

The cumulative nature of wealth and health make them ideal indicators of inequality in society. This study is among the first to both conceptualize and measure the wealth and health trajectories of Blacks, Hispanics and Whites. Compared to Whites, Racial/ethnic minorities are disadvantaged in terms of life course capital at multiple levels of social context (i.e., individual, family, peers, and neighborhood), and these disadvantages result in racial/ethnic inequalities in trajectories of wealth and health. Overall, findings suggest that racial/ethnic disparities in wealth and health increase over the life course, consistent with a process of cumulative disadvantage. Future research should utilize both between- and within-person approaches to better understand diverse aging experiences.

Figure 5.1 Net Worth Trajectory Results from the NLSY and HRS

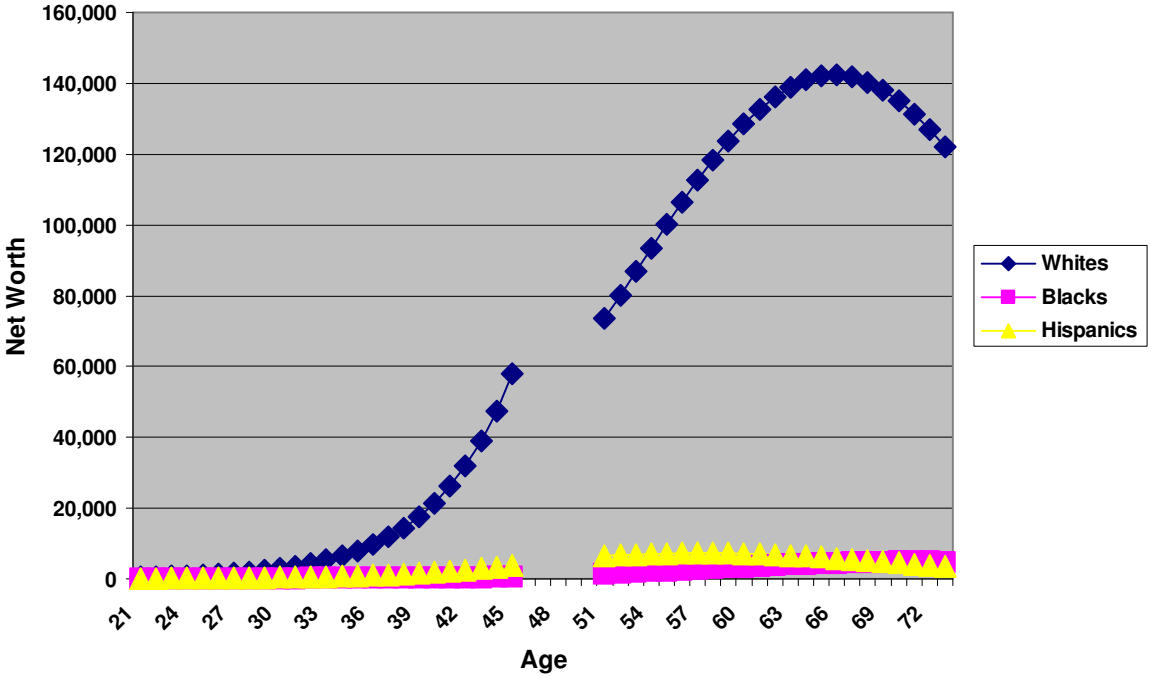
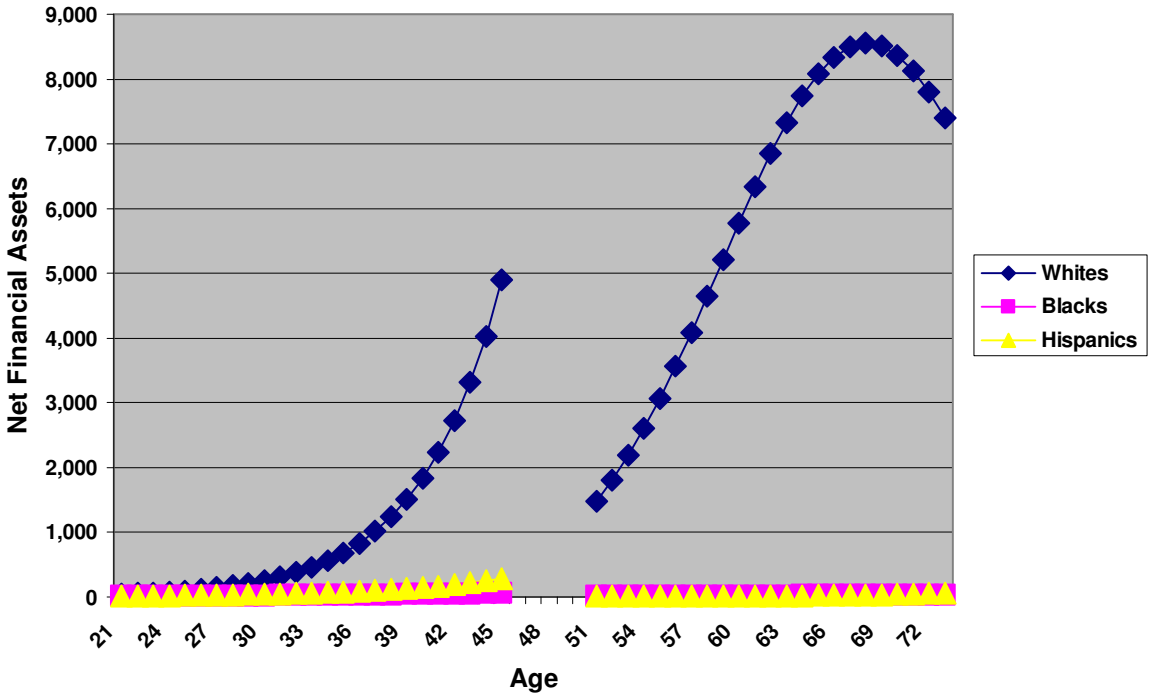


Figure 5.2 Net Financial Asset Trajectory Results from the NLSY and HRS



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