Aging-as-Leveler, Persistent Health Inequality, Cumulative Disadvantage, or All Three? Race/Ethnicity, Life Course Capital and Health Trajectories*

Tyson Brown
Duke University

Word Count Text: 10,026

Number of Tables: 5

Number of Figures: 5

Running Head: Race/Ethnicity, Life Course Capital and Health Trajectories

Prepared for the 2009 Annual Meeting of the Population Association of America, Detroit, MI. Direct all correspondence to Tyson Brown, Duke University, Department of Sociology, Box 90088, Durham, NC 27701. Phone: (919) 660-5761. Fax: (919) 660-5623. Email: tyson.brown@duke.edu . I would like to thank Glen H. Elder, Jr., Peggy Thoits, Peter Uhlenberg, Barbara Entwisle, Ted Mouw, Daniel Adkins, and David Warner. This research was supported by NIH Grant T32 AG00155-14 at the University of North Carolina Population Center and NIH Grant T32 AG00029 at the Duke Center for the Study of Aging and Human Development.

Aging-as-Leveler, Persistent Health Inequality, Cumulative Disadvantage, or All Three? Race/Ethnicity, Life Course Capital and Health Trajectories

Abstract

Racial/ethnic disparities in health levels are well-documented, yet less is known about racial/ethnic differences in age-trajectories of health. This study integrates demographic and developmental perspectives by utilizing life course theory, panel data from the Health and Retirement Study, and multilevel growth curves to investigate racial/ethnic differences in trajectories of chronic conditions and functional limitations. We empirically test three hypotheses on the nature of racial/ethnic inequalities in health across the life course (i.e., *aging-as-leveler, persistent inequality*, and *cumulative disadvantage* hypotheses), and the extent to which racial/ethnic inequalities in life course capital account for health disparities. While aging-as-leveler, persistent inequality, and cumulative disadvantage theories are often framed as competing perspectives, we find evidence to support each of them, suggesting that the underlying mechanisms are contingent upon the life stage and health outcome being analyzed. Controlling for measures of life course capital reduces but does not eliminate racial/ethnic disparities in health trajectories.

Aging-as-Leveler, Persistent Health Inequality, Cumulative Disadvantage, or All Three? Race/Ethnicity, Life Course Capital and Health Trajectories

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 people of color 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 health outcomes 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).

Although disparities in health *levels* are well-documented, less is known about racial/ethnic differences in health *age-trajectories.* Like most sociological and demographic research, previous studies on race and health have tended to examine between-person differences. Contrasting with this is a developmental, life course perspective which is primarily focused on explaining long-term, intra-individual patterns of stability and change. Whereas a between-person approach can be used to examine racial/ethnic differences in health, a within-person design would focus on patterns of intra-individual growth/decline in wealth with age (George, forthcoming). Importantly, this study integrates sociological, demographic and developmental perspectives by utilizing both between- and within-person approaches to investigate racial/ethnic differences in health trajectories.

Do health disparities shrink, persist or grow with age, and by how much? The primary aim of this study is to empirically test three competing hypotheses on the nature of racial/ethnic inequalities in health across the life course: the *aging-as-leveler* (Dowd and Bengtson 1978), *persistent inequality* (Ferraro and Farmer 1996; Henretta and Campbell 1976), and *cumulative disadvantage* hypotheses (Dannefer 1987 2003; DiPrete and Eirich 2006; Ferraro, Shippee and Schafer 2009; O'Rand 1996; Willson, Shuey and Elder 2007) posit that, with age, racial/ethnic disparities in health decrease, remain stable and increase, respectively. This study investigates how health trajectories differ among blacks, Hispanics, and whites.

Health trajectories are in influenced by the accumulation risks, resources, and human agency (Ferraro et al. 2009). Although, we know that health is shaped by the interaction of various forms of life course capital (e.g., human, economic, and social capital) over time (O'Rand 2006), few studies have examined how these forms of capital may mediate racial/ethnic disparities in health trajectories. Importantly, people of color are disadvantaged relative to whites on an array of factors including social origins, SES, family histories, and health behaviors (Brown and Warner 2008; Newman 2002). Minorities face structural disadvantages that result in greater exposure to risks and less access to opportunities and resources. The accumulation of these inequalities is likely to lead blacks and Hispanics to experience more rapid health deterioration than whites.

Another topic that has received little attention is the extent to which the effects of social and economic resources on health vary by race/ethnicity. Though a vast literature has established the existence of an SES-health gradient, treating SES as a fundamental cause of disease and disorders, several recent studies call into question the assumption that higher SES confers equal

health advantages across all racial groups (Farmer and Ferraro 2005; Pearson 2008; Shuey and Willson 2007).

The lack of knowledge about whether and how age-trajectories of health vary by race/ethnicity is due to the limitations of the conceptual and methodological 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 obscures racial/ethnic differences in age-related changes in health (Adkins et al. forthcoming). Third, many explore transitions over relatively short periods. Fourth, although Hispanics comprise a large and growing proportion of the population, few studies have investigated their health trajectories. Fifth, many studies fail to account for nonrandom attrition (e.g., mortality selection), which may bias estimates of racial/ethnic disparities in health dynamics given racial/ethnic difference in mortality rates (see Beckett 2000; Herd 2007).

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). Moreover, this study investigates whether the magnitude and direction of the SES-health relationship varies across racial groups. Overall, results show that examining racial/ethnic disparities in health trajectories is useful for understanding intracohort inequality dynamics and diverse aging experiences.

To provide an understanding of how one's position in a social hierarchy affects well-being, this study chronicles literature on the links between race/ethnicity and health; the hypotheses outlined are based on theory and empirical research. Next, is a discussion of the data and methods used for the analysis are discussed. Finally, results are presented and the implications will be discussed.

Background

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; Shuey and Willson 2008; Smith and Kington 1997). Furthermore, though rates of functional limitations and disability have recently declined (Freedman, Martin, and Schoeni 2002), blacks continue to have substantially higher rates of disability than whites, (Kelley-Moore and Ferraro 2004; Manton and Gu 2001; Schoenbaum and Waidmann 1997; Taylor 2008). 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).

The finding 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

Within life course literature on health and aging, three competing hypotheses have emerged to explain intracohort inequality as the cohort ages. The *aging-as-leveler 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* or *persistent inequality hypothesis* asserts that intracohort stratification is constant as the cohort ages. Sociodemographic and human capital factors have persistent effects on well-being over time (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; Ferraro and Farmer 1996).

Alternatively, the *cumulative advantage/disadvantage* hypothesis posits that intracohort inequality increases as the cohort ages (Dannefer 1987; 2003; DiPrete and Eirich 2006; O'Rand 1996; Willson et al. 2007). Advantages are magnified with age through a "cumulative process of differentiation" (Dannefer 1988: 16), whereby individuals with an initial advantage have increasing access to resources and exposure to opportunities (Ferraro et al. 2009). On the other hand, disadvantages early in life shape social and developmental pathways and lead to subsequent disadvantages and exposure to risk (O'Rand and Hamil-Luker 2005). Thus, racial/ethnic health disparities are hypothesized to increase with age.

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 experience 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. A 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; Hummer, Rogers and Eberstein 1998); 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; Shuey and Willson 2008; Taylor 2008).

From a life course perspective, it is important to investigate how the minority-white health gap changes with age. Although prior research (noted above) has examined racial/ethnic differences in health over *time*, few studies have 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 (Yang 2007), which can mask racial/ethnic differences in age-related changes in health (Adkins et al. *forthcoming*). The two prior studies that examined racial differences in age-trajectories of health focused on disparities in self-rated health between blacks and whites, excluding Hispanics (Shuey and Willson 2008; Yao and Roberts 2008). The present study investigates how age-trajectories of chronic conditions and functional limitations vary among blacks, Hispanics and whites. 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 Structural and Life Course Factors in Explaining Racial/Ethnic Health Disparities

Race/ethnicity and social location shape inequality in access to resources, exposure to risks and consequently health. Life course research has demonstrated how aspects of social origins influence health and well-being over the course of individuals' lives. For instance, a recent study by Warner and Hayward (2006) shows that childhood SES shapes social pathways and ultimately late-life health (see also Elo and Preston 1992; Marmot et al. 2001; O'Rand and Hamil-Luker 2005). Childhood SES indirectly influences morbidity and mortality via adult socioeconomic achievement processes (e.g., education, occupation, earnings, wealth); race

differences in childhood SES partially explain the race gap in late-life health (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, income, 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). Recent studies by Dupre (2007;2008) show that the positive effects of education on health increase with age.

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; greater wealth is associated fewer chronic conditions and functional limitations, and lower mortality rates (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 and these inequalities are likely to underlie health disparities. Compared to whites, blacks and Hispanics have lower educational attainment (U.S. Department of Education 2000), are less likely to have white-collar jobs (Fronczek & Johnson 2003), have lower household earnings (U.S. Census Bureau 2004), possess far less wealth (Oliver and Shapiro 1995; 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).

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; Yao and Roberts 2008). 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). Overall, previous research suggests that racial/ethnic SES stratification accounts for much, but perhaps not all of racial disparities in health. Interestingly, a handful of recent studies find that SES is protective for both whites and blacks, but blacks are more likely than whites to experience diminishing returns of SES (see Farmer and Ferraro 2005; Shuey and Willson 2008). Pearson (2008) argues that, within the context of unequal opportunities and barriers for different racial/ethnic groups, the acquisition of traditional socioeconomic resources may entail negative health consequences for people of color.

Family, behavioral, and societal factors are also likely to 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 health gap between whites and people of color.

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.

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; Willson et al. 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. Lastly, stratified regressions are run for whites, blacks and Hispanics to determine whether health returns to SES vary by race/ethnicity; two-tailed t-tests are used to asses the equality of coefficients across models (see Chiswick and Chiswick 1975; Liu and Umberson 2008).

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 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. Figure 1 shows the simulated trajectories of morbidity, by race/ethnicity. These simulations are based on the coefficient estimates in Table 2.

The magnitude and shape of the black-white disparity in chronic condition trajectories is revealed in Figure 2. Blacks have .23 more health conditions than whites at age 51, and the

black-white gap increases rapidly until it peaks at .44 at age 62, before declining to .24 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. Importantly, these patterns were not detected in the supplemental trajectory models (not shown) that were based on survey wave instead of age, which indicated that the health gap was constant across waves, underscoring the utility of age-based models for understanding how health disparities change with age. Indeed, wave-based analyses with substantial age heterogeneity obscure racial/ethnic differences in health trajectories when disparities have a non-linear relationship with age (see Adkins et al. *forthcoming*).

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 3 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 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 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 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 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 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 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 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 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). Figure 5 shows the predicted health trajectories by race/ethnicity, controlling for life course capital.

Appendix Tables A and B present the effects of covariates on trajectories of chronic conditions and functional limitations, respectively; growth curve models are stratified by race/ethnicity to test whether the effects of life course capital measures vary across racial/ethnic groups. Though the magnitude and significance of some coefficients differ by race/ethnicity, there is no clear pattern, and t-tests indicate that there are few instances where the effects of

covariates are significantly different between whites and people of color. Overall, results from Tables A and B suggest that whites and racial/ethnic minorities have similar health returns to social, behavioral, and economic factors. That said, this finding should be interpreted cautiously due to relatively small sample sizes of blacks and Hispanics.

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 chronic condition and functional limitation 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 aging-as-leveler, persistent inequality, and cumulative disadvantage theories are often framed as competing perspectives, there is evidence that supports all three, suggesting that the underlying mechanisms are contingent upon the life stage and health outcome 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 aging-as-leveler hypothesis—that whites are able to compress their morbidity until later stages of life, effectively delaying, but not forgoing precipitous declines in health.

Importantly, supplemental analyses that employed a wave-based approach, instead of age-based models, indicated that blacks had higher levels of morbidity than whites but that the two groups had similar rates of accumulation of morbidity across waves. Consequently, results based of the wave-based models erroneously supported the persistent inequality hypothesis. This finding highlights the fact that wave-based analyses with substantial age heterogeneity obfuscate racial/ethnic differences in health trajectories when disparities have a non-linear relationship with age (see Adkins et al. *forthcoming*), which underscores the importance of utilizing appropriate longitudinal methods when testing theories about intracohort inequality dynamics.

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 Hispanics (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). Although racial/ethnic minorities were oversampled, the *HRS* contains a relatively small number of Hispanic respondents, rendering the detection of significant differences within the Hispanic population by ethnicity (e.g. Cuban, Mexican, Puerto Rican etc.) and nativity unfeasible (see Brown and Warner 2008). Nonetheless, this study utilizes data that is nationally representative of the Hispanics to document the mid- to late-life health trajectories of

the Hispanic population residing in the U.S., as a whole. Future analyses and additional data collection efforts are needed to investigate heterogeneity among Hispanics, and to identify 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 persistent inequality hypothesis. Both Hispanics and blacks have more functional limitations than whites at age 53, 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 prior research (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. Left-censoring, however, may be an issue. Results presented here are likely to understate racial/ethnic health disparities given that people of color have higher mortality rates, and the fact that inclusion in the HRS sample is conditional upon survival to midlife (Shuey and Willson 2008; Taylor 2008). 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 protective resources and 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 is explained by racial inequalities in life course capital (see Hayward et al. 2000).

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 discrimination and unequal exposure to stressors may play a major role. Several studies find that although SES is protective for both blacks and whites, blacks are more likely than whites to experience diminishing returns of SES (Farmer and Ferraro 2005; Shuey and Willson 2008). Pearson (2008) posits that acquiring traditional socioeconomic resources is likely to entail negative health consequences for minorities, owing to unequal barriers and opportunities for different racial/ethnic groups. While this seems plausible, the present study found relatively few instances of racial/ethnic differences in health returns to socioeconomic resources, with no apparent patterns emerging from the data. More research is needed to determine whether people of color and whites benefit differently from upward mobility.

Previous studies have shown that subjective experiences of racism increase levels of stress, elevate 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). Indeed, several recent studies show that accounting racial/ethnic differences in neighborhood socioeconomic context reduced the minority disadvantage in health (Cagney, Browning and Yen 2005; Robert and Ruel 2006; Yao and Robert 2008).Unfortunately the HRS does not have information on neighborhood characteristics. Further research is needed on the roles that racism and neighborhood context play in generating disparities in health trajectories.

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.

Structural disadvantages faced by people of color reduce their access to resources and opportunities, and lead to greater exposure and vulnerability to risks and stress. As a result of their cascading of disadvantages over the life course, blacks and Hispanics have poorer health trajectories than whites. Empirical studies of racial/ethnic differences in health trajectories continue to lag behind theories on the matter. Specifically, 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, this study shows that dramatic health disparities between blacks and whites have emerged by midlife. 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.

References

Abraido-Lanza, Ana F., Bruce P. Dohrenwend, Daisy S. Ng-Mak, and J.B. Turner. 1999. "The Latino Mortality Paradox: A Test of the "Salmon Bias" and Healthy Migrant Hypotheses." *American Journal of Public Health*, 89(10): 1543-1548.

Adkins, Daniel E., Victor Wang, Matthew Dupre, Edwin J.C.G. van den Oord and Glen H. Elder, Jr. (forthcoming). "Structure and Stress: Trajectories of Depression across Adolescence and Young Adulthood." Social Forces.

Alwin, D.F., S.M. Hofer and R.J. McCammon (2006). "Modeling the Effects of Time: Integrating Demographic and Developmental Perspectives." In Binstock, R.H. and L.K. George (Eds.), *Handbook of Aging and the Social Sciences, Sixth Edition*. San Diego: Elsevier. (pp. 20-38).

Angel, R.J. and J.L. Angel. 1996. "The extent of private and public health insurance coverage among adult Hispanics." *Gerontologist*, 36:332–340.

Arias E. 2006. United States life tables, 2003. National vital statistics reports, 54(14). Hyattsville, MD: National Center for Health Statistics.

Becker, Gary S. 1981. *A Treatise on the Family*. Cambridge: Harvard University Press.

Blackwell, D.L., J.G. Collins, and R. Coles. 2002. Summary Health Statistics for U.S. Adults: National Health Interview Survey, 1997. National Center for Health Statistics. Vital Health Stat. 10:205.

Beckett Megan. 2000. "Converging Health Inequalities in Later Life—An Artifact of Mortality Selection?." *Journal of Health and Social Behavior* 2000: 41: 106-119.

Ben-Shlomo Y , D. Kuh. 2002. A life course approach to chronic disease epidemiology: conceptual models, empirical challenges and interdisciplinary perspectives. *International Journal of Epidemiology,* 31: 285-293.

Blau, Peter M., and Otis Dudley Duncan. 1967. *The American Occupational Structure*, John Wiley & Sons, Inc., New York.

Bond, Stephanie A, Patrick M. Krueger; Richard G. Rogers and Robert A. Hummer. 2003. "Wealth, Race, and Mortality." *Social Science Quarterly,* 84:667-684.

Bollen, K.A. and P. J. Curran. 2006. *Latent Curve Models: A Structural Equation Perspective*. Wiley Series in Probability and Mathematical Statistics. New York: Wiley.

Bound, J., M. Schoenbaum, and T. Waidmann. 1995. "Race and Educational Differences in Disability Status and Labor Force Attachment." *Journal of Human Resources,* 30(5): S227-S267.

Cagney, Kathleen A., Christopher R. Browning, and Ming Wen. 2005. "Racial Disparities in Self-Rated Health at Older Ages: What Difference Does the Neighborhood Make?" *Journal of Gerontology: Social Sciences*, 60(B):S181-90.

Cherlin, Andrew J. 1992. *Marriage, Divorce, Remarriage*. Cambridge, MA: Harvard University Press.

Clark, Daniel O. and George L. Maddox. 1992. "Racial and Social Correlates of Age-Related Changes in Functioning." *Journal of Gerontology: Social Sciences*, 47:S222-32.

Clipp, E. C., E. K. Pavalko, and G.H. Elder. 1992. "Trajectories of Health: In concept and Empirical Pattern." *Behavioral Health and Aging*, 2:159–179.

Conley, Dalton. 1999. *Being Black, Living in the Red: Race, Wealth, and Social Policy in America.* Berkeley, Calif.: University of California Press.

Crystal S., D. Shea. 1990. "Cumulative advantage, cumulative disadvantage, and inequality among elderly people." *The Gerontologist,* 30:437-443.

Crystal, S., D. Shea, and S. Krishnaswami. 1992. "Educational Attainment, Occupational History, and Stratification: Determinants of Later Life Outcomes." *Journal of Gerontology: Social Sciences*, 47(5):S213-221.

Dannefer, Dale. 1987. "Aging as Intracohort Differentiation: Accentuation, the Matthew Effect and the Life Course." *Sociological Forum*, 2:2.

Dannefer, Dale. 2003. "Cumulative Advantage/Disadvantage and the Life Course: Cross-Fertilizing Age and Social Science Theory." *Journal of Gerontology Series B*: *Psychological Sciences and Social Sciences*, 58:S327-S337.

Doornbos, G. and D. Kromhout. 1990. "Educational level and mortality in a 32-year follow-up study of 18-year-old men in the Netherlands." *International Journal of Epidemiology,* 19: 374–379.

Dowd, James J. and Vern L. Bengtson. 1978. "Aging in Minority Populations: A Test of The Double Jeopardy Hypothesis." *Journal of Gerontology,* 33 (May): 427-436.

Downey, D.B. 1995. "When Bigger Is Not Better: Family Size, Parental Resources, and Children's Educational Performance." *American Sociological Review* 60:746-61.

Dupre, Matthew E. 2007. "Educational Differences in Age-Related Patterns of Disease: Reconsidering Cumulative Disadvantage and Age-as-Leveler." *Journal of Health and Social Behavior*. 48(1):1-15.

Dupre, Matthew E. 2008. "Educational Differences in Health Risks and Illness Over the Life Course: A Test of Cumulative Disadvantage Theory." *Social Science Research.* 37(4): 1253-1266.

Elder, Glen H., Jr. 1998. "The Life Course as Developmental Theory." *Child Development,* 69(1): 1-12.

Elder, Glen H., Jr. 2003. "The Life Course in Time and Place." In *Sequences, Institutions And Interrelations Over the Life Course,* edited by Walter R. Heinz and Victor W. Marshall. New York: Aldine de Gruyter.

Elo, Irma, T. and Samuel H. Preston. 1992. "Effects of Early-life Conditions on Adult Mortality: A Review." *Population Index* 58:186-212.

Elo, Irma T., and Samuel H. Preston. 1997. "Racial and Ethnic Differences in Mortality at Older Ages." In *Racial and Ethnic Differences in the Health of Older Americans,* edited by Linda Martin and Beth Soldo (pp. 10-42). Washington, D.C.: National Academy Press.

Farmer, Melissa, and Kenneth F. Ferraro. 2005. "Are Racial Disparities in Health Conditional on Socioeconomic Status?" *Social Science and Medicine,* 60:191-204.

Ferraro, Kenneth F. and Melissa M. Farmer. 1996. "Double Jeopardy to Health Hypothesis for African Americans: Analysis and Critique." *Journal of Health and Social Behavior,* 37:27-43.

Ferraro, Kenneth F. and Melissa M. Farmer. 1996. "Double Jeopardy, Aging as Leveler, or Persistent Health Inequality? A Longitudinal Analysis of White and Black Americans." *Journal of Gerontology: Social Sciences,* 51B:S319-S328.

Ferraro, Kenneth F., Melissa M. Farmer, and John A Wybraniec. 1997. "Health Trajectories: Long-Term Dynamics Among Black and White Adults" *Journal of Health and Social Behavior,* 38:38-54.

Ferraro, Kenneth F., Tetyana Pylypiv Shippee, and Markus H. Schafer. 2009. "Cumulative Inequality Theory for Research on Aging and the Life Course." Pp. 413-433 in Handbook of Theories of Aging, Second Edition (edited by Vern L. Bengtson, Daphna Gans, Norella M. Putney, and Merril Silverstein). New York: Springer Publishing.

Fiscella, Kevin, Peter Franks, Marthe Gold, and Carolyn Clancy. 2000. "Inequality in Quality: Addressing Socioeconomic, Racial, and Ethnic Disparities in Health Care". *JAMA,* 283(19): 2579-2584.

Fronczek, P., and P. Johnson. 2003. "Occupations: 2000." Rep. No. C2KBR-25. Washington, DC: US Department of Commerce, Economic and Statistics Administration, US Census Bureau.

George, Linda K. Forthcoming. "Conceptualizing and Measuring Trajectories", In *The Craft of Life Course Research,* edited by Elder, Glen H., Jr. and Janet Giele. Guilford Press."

George, Linda K. 2003. "What Life Course Perspectives Offer the Study of Aging and Health", in *A New Look at Old Age: An Invitation to the Life Course*, edited by Richard. A. Settersten, Jr., Amityville, NY: Baywood Publishing Company.

Geronimus, Arline T., Maggie Hicken, Danya Keene, and John Bound. 2006. ""Weathering" and Age-patterns of Allostatic Load Scores among Blacks and Whites in the United States." *American Journal of Public Health*, 96: 826-833.

Gittleman, Maury, and Edward N. Wolff. 2004. "Racial Differences in Patterns of Wealth Accumulation." *Journal of Human Resources* 39(1): 193-227.

Glaeser, E. and J. Vigdor. 2001. *Racial Segregation in the 2000 Census: Promising News*. Washington,DC: The Brookings Institution.

Gould, Elise. 2006. "Health Insurance Eroding for Working Families". Economic Policy Institute, Briefing paper no. 175.

Hamil-Luker, Jenifer and O'Rand, Angela. M. 2007. "Gender differences in the link between childhood socioeconomic conditions and heart attack risk in adulthood." *Demography,* 44(1):137-158.

Hayward, Mark D., Toni P. Myles, Eileen M. Crimmins, and Yu Yang. 2000. "The Significance of Socioeconomic Status in Explaining the Racial Gap in Chronic Health Conditions." *American Sociological Review,* 65:910–30.

Henretta, John C. and Richard T. Campbell. 1976. "Status attainment and Status Maintenance: A study of Stratification in old age." *American Sociological Review*, 41: 981-992.

Hayward, M.D., W.R. Grady , M.A. Hardy, and D. Sommers. 1989. "Occupational Influences on Retirement, Disability and Death." *Demography,* 26:393-409.

Hayward, Mark D., Samantha Friedman, and Hsinmu Chen. 1996. "Race Inequities in Men's Retirement." *Journal of Gerontology: Social Science,s* 51B:S1-10.

Herd, Pamela. 2006. "Do Health Inequalities Diminish in Old Age?: Educational Status and Functional Decline Among the 1931-1941 Birth Cohort." *Research on Aging,* 28: pp. 375- 392.

House, Jim, Pamela Herd, and Paula Lantz. 2005. Continuity and Change in the Social Stratification of Aging and Health Over the Life Course: Evidence from a Nationally Representative Longitudinal Study from 1988-2001/2002. *The Journals of Gerontology: Social Sciences*.

Hummer, Robert. 1996. "Black-White Differences in Health and Mortality: A Review and Conceptual Model." *The Sociological Quarterly*, 37(1): 105-125.

Hummer, R., R. Rogers, and I. Eberstein. 1998. "Sociodemographic Differentials in Adult Mortality: A Review of Analytic Approaches." *Population and Development Review,* 24(3): 553-578.

Kelley-Moore, Jessica A. and Kenneth F. Ferraro. 2004. "The Black/White Disability Gap: Persistent Inequality in Later Life?" *Journal of Gerontology: Social Sciences* 59B:S34-S43.

Landale, Nancy S., R. S. Oropesa, and Bridget K. Gorman. 2000. "Migration and Infant Death: Assimilation or Selective Migration among Puerto Ricans?" *American Sociological Review*, 65(6): 888-909.

Li, Fuzhong, Terry E. Duncan, Edward McAuley, Peter Harmer, and Keith Smolkowski. 2000."A Didactic Example of Latent Curve Analysis Applicable to the Study of Aging." *Journal of Aging and Health,* 12:388-425.

Lillard, Lee, and Constantijn W. A. Panis 1998. "Panel Attrition from the Panel Study of Income Dynamics." *The Journal of Human Resources*, 33(2):437-457.

Link, Bruce G. and Jo Phelan. 1995. "Social Conditions as Fundamental Causes of Disease." *Journal of Health and Social Behavior,* 35: 80-94.

Manton, K.G., and X. Gu. 2001. "Changes in the prevalence of chronic disability in the United States black and nonblack population above age 65 from 1982 to 1999." *Proceedings of the National Academy of Sciences,* 98:6354-6359.

Markides K.S., J. Coreil. 1986. "The health of Hispanics in the southwestern United States: An Epidemiologic Paradox." Public Health Rep. 101(3):253–265.

Markides, K.S., J. Coreil, L. Rogers. 1989. "Aging and Health Among Southwestern Hispanics."In Aging and Health: Perspectives on Gender, Race, Ethnicity and Class. Edited by K.S. Markides. Newbury Park, CA: Sage Publications.

Markides, K.S., L. Rudkin, R.J. Angel, D.V. Espino. "Health Status of Hispanic Elderly." 1997. In L.G. Martin, B.J. Soldo, (eds.), *Racial and Ethnic Differences in the Health of Older Americans*. Washington, D.C.: National Academy Press.

Marmot, M., Shipley, M., Brunner, E., and Hemingway, H. "Relative Contribution of Early Life and Adult Socioeconomic Factors to Adult Morbidity in the Whitehall II Study." *Journal of Epidemiology Community Health* 2001;55;301-307.

Martin, Linda G., Schoeni, Robert F., Freedman Vicki A., and Andreski, Patricia. 2007. "Feeling Better? Trends in General Health Status." *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences,* 62:S11-S21.

Mirowsky, John and Paul Hu. 1996. "Physical Impairment and the Diminishing Effects of Income." *Social Forces* 74(3): 1073-96.

Mutchler, Jan E. and Jeffrey A. Burr. "Racial Differences in Health and Health Care Service Utilization in Later Life: The Effect of Socioeconomic Status." *The Journal of Health and Social Behavior*, 32: 342-56.

Moon, Marilyn, and F. Thomas Juster. 1995. "Economic Status Variables and the Health and Retirement Study." *Journal of Human Resources,* 30(5):S138-S157.

Nagin, D. S. 2005. *Group-based Modeling of Development*. Cambridge, MA.: Harvard University Press.

Newman, Katherine. 2003. *A Different Shade of Gray.* New York: The New Policy Press.

Noymer, Andrew. 2001. "Mortality Selection and Sample Selection: A Comment on Beckett." *Journal of Health and Social Behavior*, 42:326-327.

Oliver, Melvin L., and Thomas M. Shapiro. 1995. *Black Wealth / White Wealth: A New Perspective on Racial Inequality*. New York: Routledge.

O'Rand, Angela. 1996. "The Precious and the Precocious: Understanding Cumulative Disadvantage and Cumulative Advantage over the Life Course." *The Gerontologist,* 36 (2): 230-238.

O'Rand, Angela M. and John C. Henretta. 1999. *Age and Inequality: Diverse Pathways Through Later Life*. Boulder, CO: Westview Press.

O'Rand, Angela M.2001 "Stratification and the life course: the forms of life course capital and their interrelationships." Chapter in R.B. Binstock and L. K. George (eds) *Handbook on Aging and the SocialSciences*. *Fifth Edition*. New York: Academic Press: 197-216.

O'Rand, Angela M. 2006. "Stratification and the life course: Social origins, life course capital and cohort inequality." Chapter in R. H. Binstock and L. K. George (eds) *Handbook of Aging and the Social Sciences, Sixth Edition*. New York: Academic Press: 145-162.

O'Rand, A. M. and J. Hamil-Luker. 2005. "Processes of Cumulative Adversity: Childhood Disadvantage and Increased Risk of Heart Attack Across the Life Course." *Journal of Gerontology: Social Sciences,* 60B (Special Issue II):117-24.

Palloni, Alberto and Elizabeth Arias. 2004. "Paradox Lost: Explaining the Hispanic Adult Mortality Advantage." *Demography*, 41(3):385-415.

Pearson, Jay A. 2008. "Can't Buy Me Whiteness: New Lessons from the Titanic on Race, Ethnicity, and Health." Du Bois Review, 5 (1):27-48.

Preston, S.H. , M.E. Hill and G.L. Drevenstedt (1998). "Childhood Conditions That Predict Survival to Advanced Ages among African-Americans." *Social Science & Medicine*, 47(9):1231-1246.

Raftery, Adrian E. 1995. "Bayesian Model Selection in Social Research." *Sociological Methodology,* 25:111-163.

Raudenbush S.W. and A.S. Bryk. 2002. *Hierarchical Linear Models: Applications and Data Analysis Methods.* Thousand Oaks, CA: Sage.

Reed, W., W. Darity, and N. Robertson. 1993. *Health and medical care of African Americans*. Westport, CT: Auburn House.

Reynolds SL, Y. Saito, E. M. Crimmins. 2005. "The impact of obesity on active life expectancy in older American men and women". *Gerontologist*, 2005,;45(4):438-44.

Rogers, R. G. 1992. "Living and Dying in the USA: Sociodemographic Determinants of Death Among Blacks and Whites." *Demography*, 29(2): 287-303.

Robert, Stephanie A. and Erin Ruel. 2006. "Racial Segregation and Health Disparities Between Black and White Older Adults." Journal of Gerontology, 61: S203-11.

Ross, C.E. and C. L. Wu. 1996. "Education, Age, and the Cumulative Advantage in Health." *Journal of Health and Social Behavior,* 37:104–120.

Ross, C.E. and C. L. Wu. 1995. "The Links Between Education and Health." *American Sociological Review,* 60:719–745.

Schoenbaum, M., and T. Waidmann. 1997. "Race, Socioeconomic Status, and Health: Accounting for Race Differences in Health." *Journals of Gerontolology (B): Psychological Sciences and Social Sciences*, 52 (May): 61-73.

Schwartz, G. 1978. "Estimating the Dimension of a Model." The Annals of Statistics 6: 461-464.

Shuey, Kim M., and Andrea E. Willson. 2008. "Cumulative Disadvantage and Black-White Disparities in Life-Course Health Trajectories*." Research on Aging*, 30(2):200-225.

Singh, G.K. and M. Siahpush. 2001. "All-Cause and Cause-Specific Mortality of Immigrants and Native Born in the United States." A*merican Journal of Public Health,* 91:392-399.

Smith, James P. 1995. "Racial and Ethnic Differences in Wealth in the Health and Retirement Study." *Journal of Human Resources*, 30: S158-S183.

Smith, James P. 1999. "Healthy Bodies and Thick Wallets: The Dual Relation between Health and Economic Status," *Journal of Economic Perspectives*, 13(2), pages 145-166.

Smith, James P., and Raynard S. Kington. 1997. "Race, Socioeconomic Status and Health in Later Life." In *Racial and Ethnic Differences in the Health of Older Americans,* edited by Linda Martin and Beth Soldo (pp. 106-162). Washington, D.C.: National Academy Press.

Taylor, Miles G. 2008. "Timing, Accumulation, and the Black/White Disability Gap in Later Life: A Test of Weathering." *Research on Aging*, 30:226-250.

Teachman, Jay D. 1987. "Family background, educational resources, and educational attainment." *American Sociological Review*, 52, 548-557.

Umberson, Debra. 1987. "Family Status and Health Behaviors: Social Control as a Dimension of Social Integration." *Journal of Health and Social Behavior*, 28: 306-19.

U.S. Department of Education. 2000. Digest of Educational Statistics (Washington, D.C.: National Center for Education Statistics, 2001), Table 9.

U.S. Census Bureau. 2004. Income, Poverty, and Health Insurance Coverage in the United States: 2003. Current Population Reports, P60-226, U.S. Government Printing Office, Washington, DC.

Waite, Linda J.1995. "Does Marriage Matter?" *Demography*, 32, 483-507.

Warner, David and Mark D. Hayward. 2006. "Early Life Origins of the Race Gap in Men's Mortality." *Journal of Health* and Social Behavior, 47(3):209-226.

Williams, David R. 2005. "The Health of U.S. Racial and Ethnic Populations." *Journal of Gerontology: Social Sciences*, 60B(Special Issue II): 53-62.

Williams, David R. 1990. "Socioeconomic Differentials in Health: A Review and Redirection." *Social Psychology Quarterly*, 53:81-99.

Williams, David R. and Collins, Chiquita. 1995. "US Socioeconomic and Racial Differences in Health: Patterns and Explanations." *Annual Review of Sociology,* 21:349-86.

Williams, D.R., Neighbors, H.W., and Jackson , J.S. 2003. "Racial/Ethnic Discrimination and Health: Findings from Community Studies." *American Journal of Public Health,* 93(2): 200-208.

Willson, Andrea E., Kim M. Shuey, and Glen H. Elder, Jr. 2007. "Cumulative Advantage Processes as Mechanisms of Inequality in Life Course Health." *American Journal of Sociology*, 112(6):1866-1924.

Wilson, W.J., 1987. *The Truly Disadvantaged*. University of Chicago Press, Chicago, IL.

Yang, Yang. 2007. "Is Old Age Depressing? Growth Trajectories and Cohort Variations in Late Life Depression." *Journal of Health and Social Behavior,* 48(1):16-32.

Yao, Li and Stephanie Robert. 2008. "The Contributions of Race, Individual Socioeconomic Status, and Neighborhood Socioeconomic Context on the Self-Rated Health Trajectories and Mortality of Older Adults." *Research on Aging*, 30(2): 251-73.

Table 1 Weighted Baseline Descriptive Statistics

Variables	Whites	Blacks	Hispanics
Number of serious conditions[a]	0.56	0.91	0.563
Number of functional limitations[ab]	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 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 1 Chronic Condition Trajectories (Model 1)

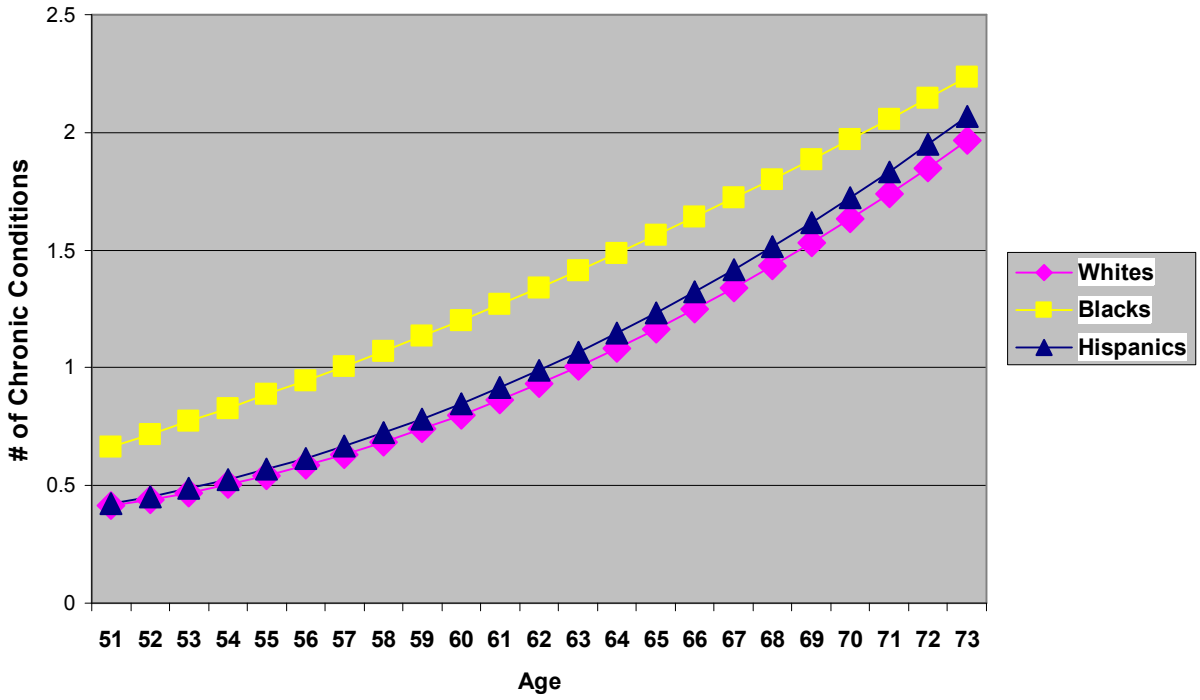


Figure 2 Black-White Disparities in Chronic Conditions, by Age

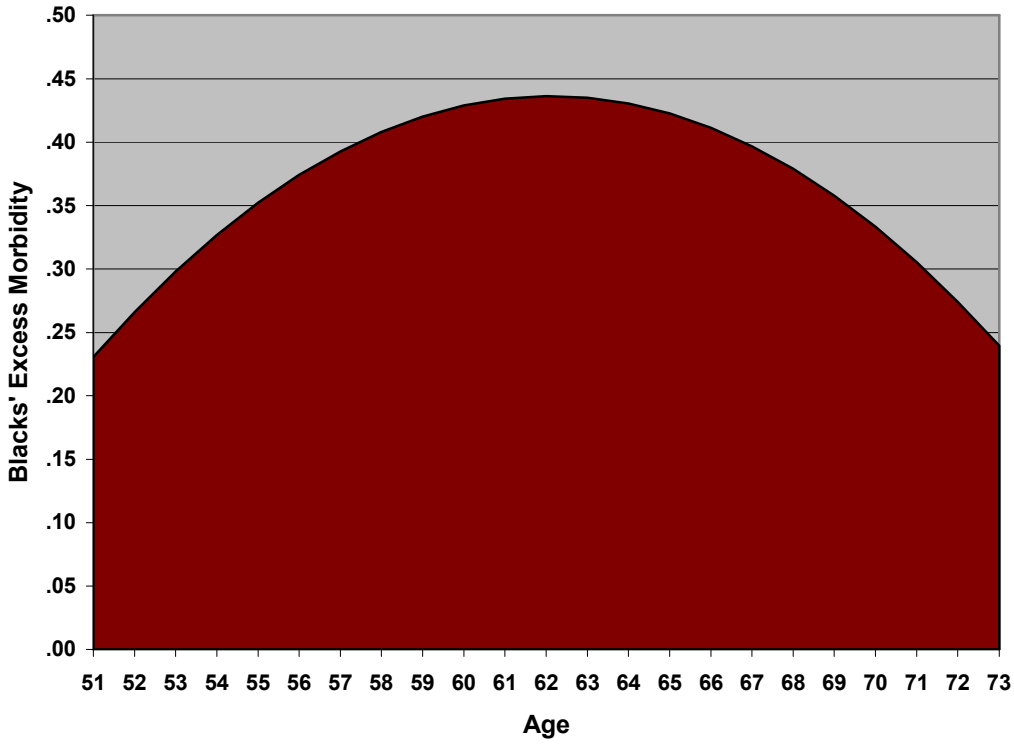


Figure 3 Chronic Condition Trajectories (Model 2)

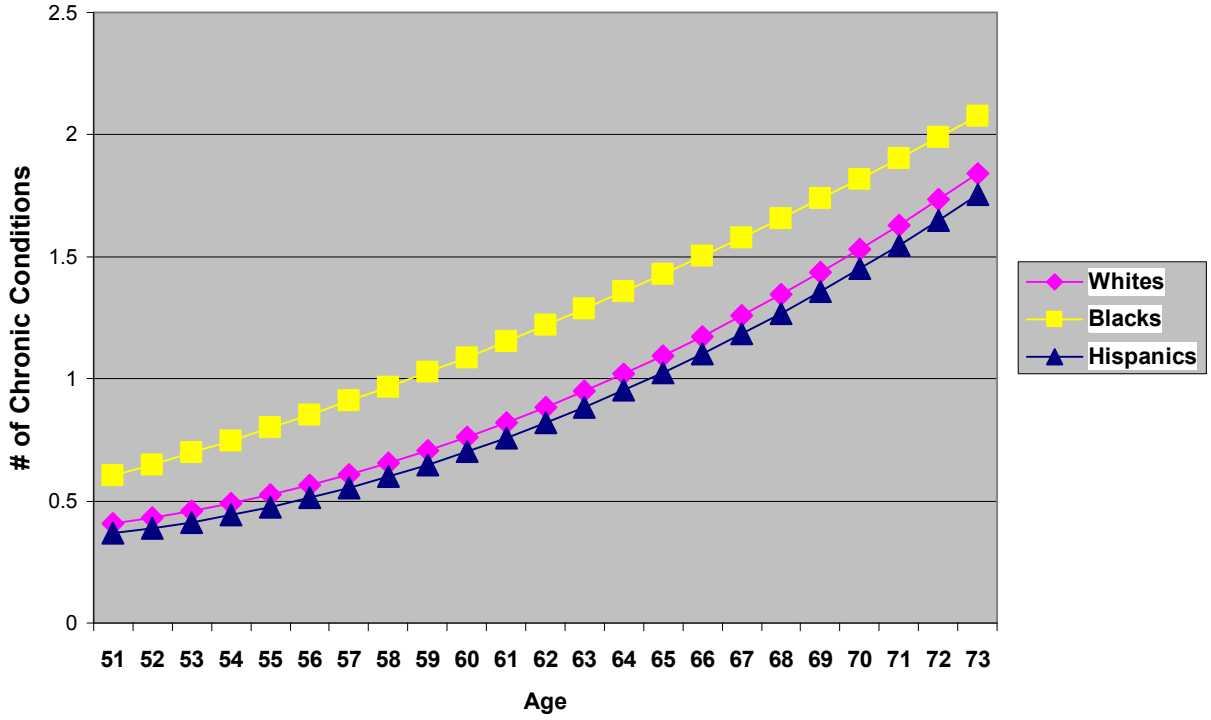


Table 3 Functional Limitation Trajectories; Growth Curve Models

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

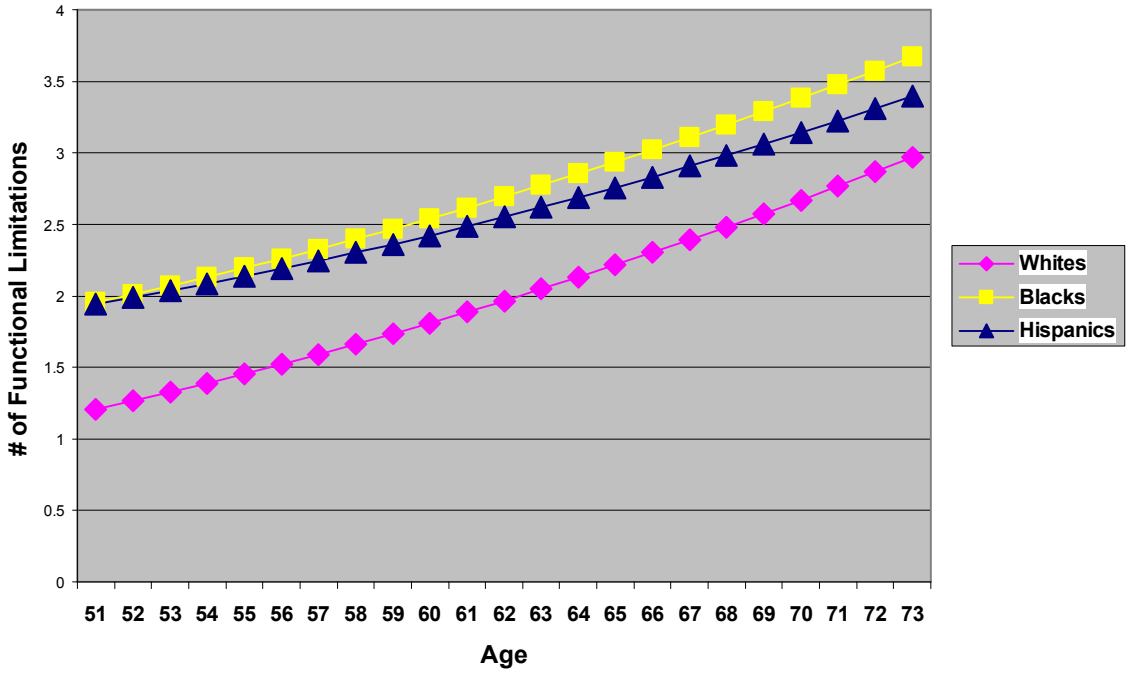
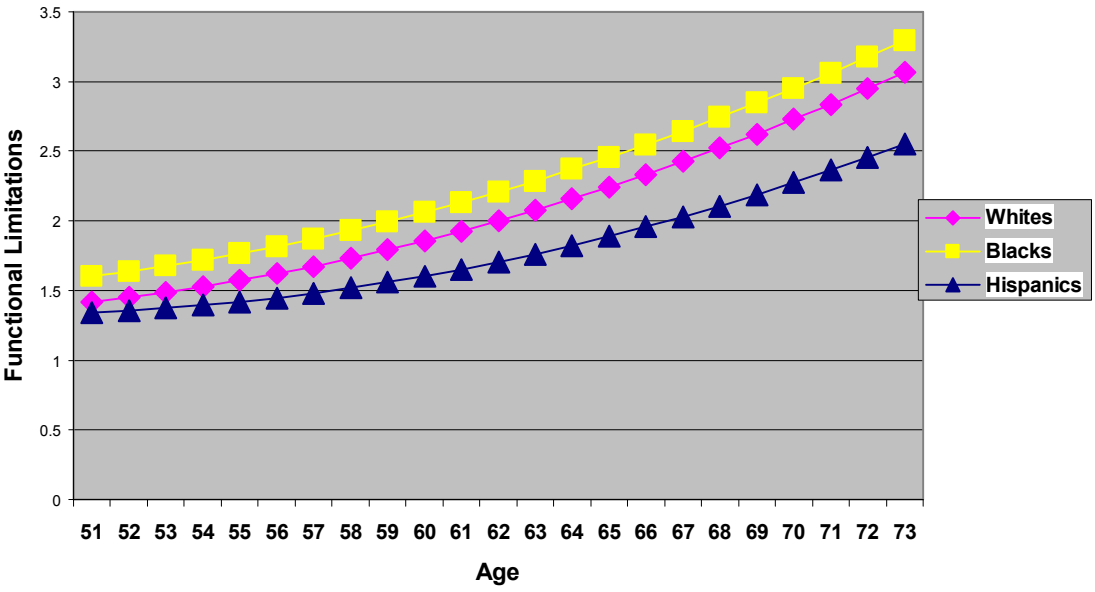


Figure 5 Functional Limitation Trajectories between Ages 51 and 73 (Model 2)



Appendix

Table A Impact of Covariates on Chronic Condition Trajectories, by Race/Ethnicity; Growth Curve Models

		Whites	Blacks	Hispanics	W? B[a]	W? H[a]
Fixed Effects						
Initial status, π_{0i}	Intercept	.404 ***	.472 ***	.416 ***		
	Mother had < H.S. Education	-.076 *	-.143	-.148		
	Father had < H.S. Education	-.036	.153	.041		
	Years of Education	-.006	-.008	-.003		
	Earnings	-.002	-.006 +	-.002		
	Social Security Income	.007 ***	.013 ***	.008		
	Net Worth	-.001	-.002	.002		
	Uninsured	.015	-.035	-.021		
	Obese	-.016	-.020	-.108 **		*
	Ever smoked	.116 ***	.103 +	.011		
	Currently smoke	-.119 ***	-.072 *	-.120 *		
	Heavy Drinker	.042	.028	-.123		
	Unmarried	.014	.053	.098 *		
	Mid-West	-.010	.040	-.108		
	West	.001	-.066	-.019		
	South	-.030	-.013	.036		
	Number of waves	-.033 ***	-.064 ***	-.028	*	
Rate of linear change, π_{1i}	Intercept	.018 ***	.053 ***	.016	***	
	Mother had < H.S. Education	-.005	.007	.021		
	Father had < H.S. Education	.005	-.011	.000		
	Years of Education	-.001 **	-.001 +	-.001		
	Earnings	.000	.000	.000		
	Social Security Income	.000 **	-.001 *	.000		
	Net Worth	.000	.000	.000 *		
	Uninsured	-.004 *	.001	-.001		
	Obese	.004 **	.001	.010 **		
	Ever smoked	.006 **	.003	-.001		
	Currently smoke	-.003	-.006 +	-.005		
	Heavy Drinker	-.004	-.009	.010		
	Unmarried	.001	-.008 *	-.006	*	
	Mid-West	.003	-.011 +	-.005	*	
	West	-.004	-.001	-.003		
	South	.004	.001	-.002		
	Number of waves	-.006 ***	-.004 *	-.003		
Rate of quadratic change, π_{2i}	Intercept	.002 ***	.001 ***	.002 ***	***	
Random Effects						
	Level 1 Residual	.251 ***	.258 ***	.269 ***		
	Level 2 Age	.126 ***	.135 ***	.130 ***		
	Level 2 Age^2	.006 ***	.006 ***	.007 ***		
	Level 2 Intercept	.716 ***	.878 ***	.788 ***		
	N	6855	1659	855		
	Log Likelihood	-22742	-5622	-3015		

[a] "W ? B" and "W ? H" indicate the tests for differenences in the effects of covariates between whites and blacks, and whites and Hispanics, respectively

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

Table B Impact of Covariates on Functional Limitation Trajectories, by Race/Ethnicity; Growth Curve Models

		Whites	Blacks	Hispanics	W? B[a]	W? H[a]
Fixed Effects						
Initial status, π_{0i}	Intercept	1.395 ***	.944 **	1.691 ***		
	Mother had < H.S. Education	-.036	-.132	-.495		
	Father had < H.S. Education	-.191	-.669	.407		
	Years of Education	-.153 ***	-.144 ***	-.099 ***		
	Earnings	-.039 ***	-.129	-.092 ***	***	*
	Social Security Income	.103 ***	.105 ***	.106 ***		
	Net Worth	-.025 ***	-.024 **	-.030 +		
	Uninsured	-.056	.033	-.294		
	Obese	.288 ***	.268 +	.193		
	Ever smoked	.465 ***	.623 **	.509 *		
	Currently smoke	-.189 *	-.266	.198		
	Heavy Drinker	.157	.802 +	-.182		
	Unmarried	.127 +	.257	.473 *		
	Mid-West	.024	.298	-.707		
	West	.010	.479	-.753 +		
	South	-.036	-.163	-.875 *		*
	Number of waves	-.056 *	-.162 *	.015		
Rate of linear change, π_{1i}	Intercept	.013	-.094 **	.022	*	
	Mother had < H.S. Education	.001	-.053	.022		
	Father had < H.S. Education	.012	.069	-.065		
	Years of Education	-.004 **	.002	.000		
	Earnings	.002 ***	.007 ***	.006 **	**	
	Social Security Income	-.009 ***	-.008 ***	-.006		
	Net Worth	-.001	.001	.000		
	Uninsured	.008	-.013	-.002		
	Obese	.018 **	-.002	.012		
	Ever smoked	.006	-.015	-.012		
	Currently smoke	.003	.009	-.028		
	Heavy Drinker	.012	-.030	.039		
	Unmarried	-.006	-.002	.000		
	Mid-West	.004	-.025	.048		
	West	.010	-.003	.062 +		
	South	.021 *	.033	.058		
	Number of waves	-.016 ***	.000	-.005		
Rate of quadratic change, π_{2i}	Intercept	.002 ***	-.001	.001	*	
Random Effects						
	Level 1 Residual	1.315 ***	1.677 ***	1.706 ***		
	Level 2 Age	.219 ***	.289 ***	.249 ***		
	Level 2 Age^2	.011 ***	.012 ***	.012 ***		
	Level 2 Intercept	1.802 ***	2.120 ***	1.815 ***		
	N	6527	1547	810		
	Log Likelihood	-66187	-16377	-8593		

[a] "W ? B" and "W ? H" indicate the tests for differenences in the effects of covariates between whites and blacks, and whites and Hispanics, respectively

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