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UNDERSTANDING HOW RACE/ETHNICITY AND GENDER DEFINE AGE-TRAJECTORIES OF DISABILITY: AN INTERSECTIONALITY APPROACH

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ABSTRACT

A number of prior studies have demonstrated wide disparities in health among racial/ethnic groups and between men and women, yet few have examined how race/ethnicity and gender intersect or combine to affect the health of older adults. The tendency of prior research to treat race/ethnicity and gender separately has potentially obscured important differences in how health is produced and maintained, undermining efforts to eliminate health disparities. The current study extends previous research by taking an intersectionality approach (Mullings & Schulz, 2006), grounded in life course theory, conceptualizing and modeling trajectories of functional limitations as dynamic life course processes that are jointly defined by race/ethnicity and gender. Data from the nationally representative 1994-2004 Health and Retirement Study and growth curve models are utilized to examine racial/ethnic/gender differences in intra-individual change in functional limitations among white, black and Mexican American men and women, and the extent to which differences in life course capital account for group disparities in initial health status and rates of change with age. Results strongly support an intersectionality approach, with all demographic groups exhibiting worse functional limitation trajectories than white men. Whereas white men had the lowest levels of disability at baseline, white women and minority men had intermediate levels of disability, and black and Hispanic women had the highest levels of disability. Consistent with the persistent inequality hypothesis, these health disparities remained stable with age. Dissimilar early life social origins, adult socioeconomic status, marital status, and health behaviors explain the racial/ethnic disparities in functional limitations among men but only partially explain the disparities among women. Net of controls for life course capital, women of all racial/ethnic groups have higher levels of functional limitations relative to white men and men of the same race/ethnicity. Findings highlight the utility of an intersectionality approach to understanding health disparities.

Race/ethnicity and gender jointly and simultaneously structure the production and maintenance of health in the United States (Mullings & Schulz, 2006). Indeed, among older adults wide disparities in health exist (Moen & Spencer, 2006; Williams & Wilson, 2001) and, despite overall improvements in health and targeted policy interventions, there is little evidence of these disparities narrowing over time (Gorman & Read, 2006; Martin, Schoeni, Freedman, & Andreski, 2007). Racial/ethnic minorities have worse health than do whites on a number of indicators including several chronic diseases, functional limitations, and mortality (Hayward & Heron, 1999; Markides, Rudkin, Angel, & Espino, 1997; Rogers, Hummer, & Nam, 2000). Men have higher mortality risks, while women are more likely to suffer from non-fatal chronic conditions and to be functionally impaired (Gorman & Read, 2006; Laditka & Laditka, 2002; Verbrugge, 1989).

Notably absent from prior research, however, is direct examination of how race/ethnicity and gender combine—or intersect—to define the health of older Americans. An intersectionality approach stipulates that because race/ethnicity and gender are fundamental determinants of opportunity structure, defining access to both the resources that promote health and exposure to the risks that undermine health, their effects cannot be disaggregated or understood separately. In short, an intersectionality approach posits race/ethnicity and gender are *not* separate, additive, dimensions of social stratification but are mutually defining, and reinforce one another in a myriad of ways in the production and maintenance of health across the life course (Mullings & Schulz, 2006). Few prior studies have examined racial/ethnic *and* gender differences in health using such an intersectionality approach (for a recent exception see Read & Gorman, 2006); fewer still have applied longitudinal data to the problem. Instead, prior research on age-trajectories of health has tended to treat race/ethnicity and gender separately, or has examined

only later-life determinants of poor health, and therefore has potentially obscured important differences in how health is produced and maintained, undermining efforts to eliminate health disparities.

Therefore, the current study examines how race/ethnicity and gender jointly determine age-trajectories of functional limitations among older adults. To do this, we use data from the nationally representative 1994-2004 *Health and Retirement Study* (HRS) to examine intra-individual change in functional limitations among white, black and Mexican American men and women, and the extent to which differences in life course capital account for group disparities in initial health status and rates of change with age. We focus on disability because it is the manifestation of underlying chronic disease processes (Kelley-Moore & Ferraro, 2004; Verbrugge & Jette, 1994) and is an important indicator of total morbidity burden in the population (Hayward & Warner, 2005).

The current study advances our understanding of health disparities in several important ways. First, we employ an intersectionality approach (Mullings & Schulz, 2006), grounded in life course theory (Elder, Johnson, & Crosnoe, 2003; O'Rand, 2006), conceptualizing and modeling trajectories of functional limitations as dynamic life course processes *jointly* defined by race/ethnicity and gender. Second, we model trajectories of functional limitations as developmental age-based processes (Alwin, Hofer, & McCammon, 2006). Prior studies using wave-based trajectories(e.g., Liang et al., 2008; Mendes de Leon, Barnes, Bienias, Skarupski, & Evans, 2005), often in combination with accelerated cohort designs that pool short-term panel data across multiple birth cohorts (e.g., Kim & Durden, 2007; Kim & Miech, 2009), do not account for age-heterogeneity within survey wave, conflating age and cohort effects, and thus potentially obscure true developmental change in health. Indeed, even within prospective cohort

studies panel attrition can mask developmental change, which is why we also explicitly model mortal and non-mortal panel attrition in the estimation of age-trajectories of functional limitations. Finally, we advance the study of inequality in health trajectories by examining the experiences of older Mexican American men and women, an important group given their projected increase as a share of the aged population (Angel & Whitfield, 2007). Prior studies of health trajectories have largely focused on black-white differences (e.g., Ferraro & Farmer, 1996; Kelley-Moore & Ferraro, 2004; Taylor, 2008) or, when not limited to these two groups, have considered only an amorphous Hispanic category (e.g., Liang et al., 2008).

PRIOR STUDIES

Racial/Ethnic and Gender Disparities in Health

Race/ethnicity and gender are key dimension of social stratification. As such, racial/ethnic and gender stratified opportunity structures result in the accumulation of disadvantages for women and racial/ethnic minorities and consequently disparate aging experiences (Bird & Rieker, 1999; Moen & Spencer, 2006; Mullings & Schulz, 2006). Indeed, racial/ethnic and gender disparities in health are well-documented (Angel & Whitfield, 2007; Verbrugge, 1989; Williams & Collins, 1995). Blacks have a higher prevalence of diabetes, arthritis, hypertension, stroke, and heart disease (Blackwell, Collins, & Coles, 2002) and worse self-rated health (Shuey & Willson, 2008). Blacks also have higher rates of disability and levels of functional impairment (Kelley-Moore & Ferraro, 2004, 2005) than do whites. Given these disparities, it is not surprising that blacks experience higher mortality rates than do whites (Rogers, Hummer, & Nam, 2000).

Similar to blacks, various Hispanic subgroups exhibit higher rates of several chronic diseases, including, hypertension, kidney disease and diabetes (Markides, Coreil, & Rogers,

1989), report poorer self-rated health (Ren & Amick, 1996), and have worse functional health than whites (Markides, Eschbach, Ray, & Peek, 2007). However, older Hispanics—particularly Mexican Americans—have all-cause mortality rates similar to those experienced by whites (Hummer, Rogers, Amir, Forbes, & Frisbie, 2000), part of the Hispanic epidemiological paradox. As a result of high morbidity rates coupled with low mortality rates, Mexican Americans can expect to live more years disabled than whites or blacks (Hayward, Warner, & Crimmins, 2007).

Gender disparities in health are also well-known: women live longer than do men but are more likely to suffer from chronic health problems and to have multiple comorbidities (Laditka & Laditka, 2002; Newman & Brach, 2001; Verbrugge, 1989). However, the magnitude of the gender gap in health varies considerably depending on the morbidity measure (Gorman & Read, 2006; MacIntyre, Hunt, & Sweeting, 1996). Nevertheless, prior studies consistently find that women are more likely to have functional limitations than men (Laditka & Laditka, 2002; Read & Gorman, 2006), this gender gap increases with age (Newman & Brach, 2001), and consequently that women live more years disabled (Laditka & Laditka, 2002).

Prior studies have rarely considered how race/ethnicity and gender jointly differentiate the health status of older adults and instead have examined race/ethnicity or gender as if they were separate dimensions of social stratification. By contrast, an intersectionality approach systematically examines the interactive influences of race/ethnicity and gender on health and health trajectories across the life course (Mullings & Schulz, 2006). That is, an intersectionality approach begins with the premise that forms of oppression (e.g., racism, sexism) overlap, and thus posits that the consequences of race/ethnicity and gender cannot be understood sufficiently by studying these phenomena separately; rather, understanding their overall effects necessitates

examining how race/ethnicity/gender interrelate or intersect to define access to resources that promote and exposures to the risks that undermine health across the life course.

Although few studies have examined racial/ethnic/gender disparities in health using an intersectionality approach, there are empirical indications that gender conditions health among racial/ethnic minorities. Black and Hispanic women have higher prevalence rates of a number of chronic conditions than whites, with black women the most disadvantaged (Greenlund et al., 1998; Hayward, Crimmins, Miles, & Yu, 2000; McGee, Cooper, Liao, & Durazo-Arvizu, 1996). Racial/ethnic minority women also have disproportionately high levels of functional limitations compared to white women. Moreover, the gender gap in disability among racial/ethnic minorities is greater than that among whites (Hayward & Heron, 1999; Hayward et al., 2007; Read & Gorman, 2006).

Race/Ethnicity/ Gender Disparities in Disability Trajectories

Prior sociological, demographic, and epidemiologic studies of racial/ethnic and gender disparities in health and disability, as described above, have typically examined between-person differences. In contrast, developmental life course research aims to explain long-term, intra-individual patterns of stability and change. Whereas a between-person design is useful for investigating group differences in health and functional status, it provides very little on the timing, pace, and development of health. The within-person approach of developmental life course theory focuses on patterns or trajectories of intra-individual health decline or improvement with age (Alwin et al., 2006; George, 2009). Notably, the current study integrates the demographic and developmental perspectives by using both between- and within-person approaches to investigate how age trajectories of functional impairment vary across racial/ethnic/gender groups among older adults in the U.S.

It is widely recognized that health develops across the life course and disparities in health trajectories exist between social groups (House et al., 1994; Kuh & Ben-Shlomo, 1997). Still, how these trajectories change with age is a matter of considerable theoretical and empirical debate, as three competing hypotheses have emerged to explain inequality as cohorts age (see Ferraro & Farmer, 1996). The *aging-as-leveler hypothesis* 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, group differences in functional impairment would be expected narrow or converge in later life. The *persistent inequality hypothesis* asserts that demographic and socioeconomic factors have consistent effects on health with age so racial/ethnic/gender differences in disability would be expected to remain stable with age, as demonstrated by parallel age-trajectories. Alternatively, the *cumulative advantage/ disadvantage* hypothesis argues that inequality increases as the cohort ages (Dannefer, 1987) because individuals with an initial advantage have increasing access to resources and exposure to opportunities with age, while those with initial disadvantages have diminished access to resources and greater exposure to risk with age (O'Rand, 2006). Thus, according to this hypothesis, and the aged-specific *double-jeopardy* variant (e.g., Ferraro & Farmer, 1996), we would expect racial/ethnic/gender disparities in disability to increase with age as trajectories diverge.

The nature of racial/ethnic/gender disparities in disability trajectories is unclear from prior research, as few studies have applied an intersectional approach. Many prior longitudinal studies of racial/ethnic disparities in health, disability and mortality have not been primarily concerned with how gender conditions disability trajectories (Kahng, Dunkle, & Jackson, 2004; Liang et al., 2008; but see Mendes de Leon et al., 2005). Instead, prior research on disability

trajectories has largely focused on differences between blacks and whites (Ferraro & Farmer, 1996; Kelley-Moore & Ferraro, 2004; Kim & Miech, 2009; Taylor, 2008) controlling for gender, or differences between men and women controlling for race/ethnicity (Anderson, James, Miller, Worley, & Longino, 1998; Guralnik & Kaplan, 1989; Kahng et al., 2004). Such studies largely demonstrate that black-white disparities in disability are exacerbated over time as trajectories of functional impairment diverge with age (Kelley-Moore & Ferraro, 2004; Kim & Durden, 2007; Liang et al., 2008; Mendes de Leon et al., 2005), although there is some competing evidence of persistent inequality between blacks and whites (Ferraro & Farmer, 1996) or convergence between blacks and whites at the oldest ages (Kim & Miech, 2009). The disability trajectories of Mexican Americans vis-à-vis blacks and whites have not been well documented. Using data from the HRS/AHEAD and wave-based trajectories, Liang and colleagues (2008) found that, while they had higher initial levels of ADL and IADL impairment, Hispanic older adults did not differ from Non-Hispanic whites in terms of change in impairment with time. Unfortunately, Liang and colleagues (Liang et al., 2008) used the amorphous Hispanic group in their analysis, combining a number of distinct subgroups, and thus obscuring important variations (See Markides et al., 2007; Read & Gorman, 2006).

Despite the fact that women have higher disability prevalence rates than do men (Gorman & Read, 2006; Laditka & Laditka, 2002), gender differences in age-trajectories of disability are ambiguous. Several studies suggest that men and women have similar rates of change in functional status (e.g., Guralnik & Kaplan, 1989; Kahng et al., 2004). However, other studies suggest that women face accelerated rates of disability and functional impairment (e.g., Anderson et al., 1998; Liang et al., 2008), consistent with cumulative advantage/disadvantage hypothesis. Yet, still several studies find that while women have higher initial levels of

functional impairment, men experience higher rates of functional decline and this results in a convergence of the disability gender gap with age (e.g., Maddox & Clark, 1992; Mendes de Leon et al., 2005).

While prior studies have infrequently taken an intersectionality approach to understand cross-sectional differences in the prevalence of disability across racial/ethnic/gender groups, longitudinal investigations have been even rarer. The few longitudinal studies that exist find that black women have disproportionately higher levels of functional impairment and steeper rates of increases with age than do black men, compared to the differences between white women and men (Kim & Miech, 2009; Mendes de Leon et al., 2005). How the functional trajectories of older Hispanic women compare to older Hispanic men, blacks, and whites is unknown. Yet, there is some evidence to suggest that Hispanic women face elevated risks of work-disability similar to those experienced by black women (Brown & Warner, 2008).

Socioeconomic Explanations for Disparities in Disability Trajectories

The life course perspective emphasizes that health is shaped by the interaction of various forms of life course capital over time (Kuh & Ben-Shlomo, 1997; O'Rand, 2006). An extensive body of research has documented the health consequences of numerous social factors including childhood socioeconomic conditions (Haas, 2008; Warner & Hayward, 2006), educational attainment (Dupre, 2007; Hayward et al., 2007), income (Rogers et al., 2000), wealth (Smith, 1999), and marriage (Waite, 1995). Given that black and Hispanics Americans are disadvantaged relative to whites on these key social determinants of health, and that women are disadvantaged relative to men on many (though not all) of these same indicators, we would expect that the socioeconomic inequality experienced by racial/ethnic/gender minorities would explain their higher levels of functional impairment. Likewise, because health trajectories are influenced by

the accumulation of resources and risks over time (O'Rand, 2006), and race/ethnicity/gender define opportunity structures that convey access to human, economic and social capital resources, and exposure to health risks in the United States (Mullings & Schulz, 2006; O'Rand, 2006), socioeconomic factors should explain racial/ethnic/gender inequality in disability trajectories.

Overall, previous research suggests that racial/ethnic socioeconomic inequality accounts for much—but not all—of racial/ethnic disparities in health and functional impairment (Hayward et al., 2000; Kim & Miech, 2009; Warner & Hayward, 2006). For example, in a study of North Carolina elders aged 65 and over, adjusting for socioeconomic status, morbidity, and social support eliminated the diverging trajectories of blacks and whites, though a consistent gap remained between blacks and whites (Kelley-Moore & Ferraro, 2004). While prior studies have not examined trajectories of disability among Hispanics, in their cross-sectional study, Read and Gorman (2006) found that adjusting for socioeconomic status (incl. marital status) not only eliminated disadvantage faced by Mexican American women, but actually reversed it so that Mexican American women had a lower odds of functional limitations relative to white men. Complicating matters, though consistent with an intersectionality approach, there is some suggestion from prior studies that SES better explains racial/ethnic differences in functional limitations among men than among women (Mendes de Leon et al., 2005; Read & Gorman, 2006). By and large, though, the explanatory power of SES disparities in understanding functional limitations defined by race/ethnicity/gender has not been fully documented.

Research Questions

Two broad sets of questions remain about disparities in disability trajectories among older adults: (1) How do age-trajectories of functional impairment vary between white, black and

Mexican American men and women? Does the pattern of change between groups show divergence (i.e., cumulative disadvantage), remain stable (i.e., persistent inequality), or narrow (i.e., age-as-leveler) with age? Are these disparities consistent within and between racial/ethnic and gender groups? (2) Are these patterns of disability inequality explained by racial/ethnic/gender differences in childhood and adult socioeconomic status and health behaviors? Is the explanatory power of these factors similar for all race/ethnicity/gender groups? We provide answers to both sets of questions in the current study.

DATA AND METHODS

We used six waves of panel data from the 1994-2004 Health and Retirement Study (HRS) to examine how race/ethnicity and gender intersect to define trajectories of disability. The HRS is a nationally representative panel of non-institutionalized adults who were aged 51-61 at the time of initial data collection in 1992 and contains oversamples of African-Americans and Hispanics. While a small proportion of the population is institutionalized at the target ages of the panel, levels of disability may be somewhat understated given the exclusion of institutionalized persons at baseline (HRS, 2006). Respondents have been reinterviewed biennially. We excluded the initial 1992 interview from the analysis because the measures of functional limitations at that interview differ from those asked thereafter (Haas, 2008). The 1994-2004 panel covers respondents ages 53 to 73.

Our analytic sample was limited to 7,965 U.S. born white, black and Mexican Americans. We limited Hispanic respondents to only those of Mexican-origin because there is health and socioeconomic heterogeneity among the various Hispanic subgroups (Hummer et al., 2000; Read & Gorman, 2006). Unfortunately, given the HRS sampling procedures, the oversampling of Hispanics primarily increased the inclusion of Mexican Americans (See HRS, 2006). Other

Hispanic subgroups (e.g., Puerto Ricans, Cubans) were sampled with frequencies too small to permit multivariate estimation and, given subgroup heterogeneity, it made little sense to retain these respondents as residual group of "other" Hispanics. We limited all respondents to those born in the U.S. to reduce the potential for bias resulting from the healthy immigrant effect or from return-migration (Palloni & Arias, 2004). We excluded respondents from other racial groups due to small sample sizes.

Measures

Dependent Variable

Disability was measured with twelve standard self-reported items that assessed *Functional Limitations* related to mobility, strength and upper- and lower-body tasks. Respondents were asked whether they had difficulty: walking several blocks; walking one block; walking across the room; climbing several flights of stairs; climbing a single flight of stairs; sitting for two hours; getting up from the seated position; stooping, kneeling, or crouching; pushing or pulling large objects; lifting ten pounds; raising arms above the shoulder; or picking a dime off of a table. Given the low prevalence of reported difficulty, we dichotomized each measure (1= any difficulty) and created a summary count of limitations ranging from 0 to 12 (α=0.84-0.86, depending on wave [not shown]). While prior studies of disability have often used measures of basic and instrumental activities of daily living (ADLs and IADLs, respectively), these tend to measure much more severe forms of impairment (e.g., difficulty bathing) that are rare among the young-old population represented in the HRS.

Independent Variables

Consistent with an intersectionality approach (See Read & Gorman, 2006), our primary independent measure combines race/ethnicity and gender into a series of mutually-exclusive

dummy variables for *Mexican American Women*, *Mexican American Men*, *Black Women*, *Black Men*, and *White Women*. Combining race/ethnicity and gender in this way allows us to contrast the disability trajectories of each racial/ethnic/gender group against the experiences of white men (the reference category). We classified respondents as Mexican-origin based on a question concerning detailed Hispanic ethnicity. We coded respondents white or black if they identified as such and did not report any Hispanic ethnicity.

To capture developmental change in functional impairment (Singer & Willett, 2003), we specified both a linear *age* parameter and a non-linear age^2 parameter. Age was calculated as the number of years above 53 with a range of 0 to 20 (i.e., at 53, *age* =0… at 73, age=20). A number of prior studies have found the age-related change in disability to be non-linear necessitating both parameters (Kim & Durden, 2007; Kim & Miech, 2009; Mendes de Leon et al., 2005).

Covariates

We include a number of life course factors to capture the differential health risks faced by women and men of various racial/ethnic groups. These covariates include measures of early life social origins, socioeconomic status, marriage, and health-related behaviors, as well as controls for panel attrition.

Early Life Social Origins. We measured early life social origins with three dummy variables indicating whether the *Family was Poor* (=1), *Father's Education* and *Mother's Education* (more than a high school diploma=1; otherwise=0). A number of respondents were missing on these measures because they either did not know or because in the case of family's relative income status they attrited from the panel prior to 1998 when this question was asked. To retain these cases in the analysis, we also specified a dummy variable for missingness on each variable (missing=1; otherwise=0).

Socioeconomic Status. We captured respondents' adult socioeconomic status with five measures. *Education* was operationalized as total years of schooling, ranging from 0 to 17 or more. *Household Earnings* is the sum of all wages and salaries. *Household Social Security Income* is the value of all Social Security payments received. *Net Worth* is the sum of all household assets, minus any debts. We logarithmically transformed each of these income and wealth measures to adjust for the left skewness. To facilitate interpretation in our growth curve modeling strategy (Singer & Willett, 2003), as described below, we centered education so that zero indicates 12 years of schooling (i.e., completion of high school). We mean centered the income and wealth measures so that zero indicated the average value on each measure. *In the Labor Force* is a dummy variable coded one if the respondent indicated working for pay or otherwise was in the labor force. We captured *Health Insurance* availability with a dummy variable coded one if the respondent had health insurance coverage from any source.

Marriage. We controlled for marital status with a series of dummy variables for *Divorced* (=1), *Widowed* (=1), or *Never Married* (=1). Married served as the reference category.

Health-Related Behaviors. Several dummy variables summarized known behavioral risks of poor health and disability. We captured obesity with a dummy variable coded one if the respondent was *Obese* with a BMI greater than 30. Smoking behavior was captured with two dummy variables indicating whether the respondent *Ever Smoked* (=1) and *Currently Smokes* (=1). We measured alcohol use with a dummy variable for *Heavy Drinking* (3+ drinks/day=1).

Panel Attrition. With any longitudinal panel nonrandom mortal and non-mortal panel attrition is of concern as both may be related to observed health disparities (Dupre, 2007; Kim & Miech, 2009; Liang et al., 2008). Over the survey period, 18.1% of the sample (1441 cases) missed at least one interview for reasons other than death and 12.9% of the sample (1034 cases)

died. As is evident from Table 1, the number of waves respondents were interviewed and the likelihood of dying during the observation period varied by race/ethnicity/gender. Preliminary analyses revealed that both panel drop-out and death were associated with higher levels of functional limitations in the HRS. To account for these racial/ethnic and gender differences in panel attrition we included two additional control variables in our models (Liang et al., 2008). We captured the number of waves a respondent was observed with count of *Occasions* ranging from 1 to 6 and included a dummy variable indicating whether the respondent *Died* (=1) during the panel.

Except for race/ethnicity, gender, and early life social origins, all covariates were time-varying and measured contemporaneously. While one could argue that covariates should be lagged so that functional limitations are predicted by covariates measured at the previous interview, our focus here was not on establishing causal relationships but on determining how gender conditions racial/ethnic disability trajectories and the extent to which differences between groups were mediated by life course inequalities. Moreover, lagging reduced the cases available for analysis by slightly more than 15%, diminishing statistical power to detect differences. Supplemental analyses (not shown) indicted that the findings from this study were largely similar to those with the covariates lagged.

Analytic Strategy

Consistent with developmental and life course theory, and in contrast to prior studies that have employed wave-based techniques, we reorganized the HRS into an age-based file in order to accurately examine age-based changes in functional impairment (Singer & Willett, 2003). Given the considerable age heterogeneity within each wave of the HRS (a range of 11 years), estimation of developmental trajectories in a wave-based file has the potential to conflate age and

cohort effects (Alwin et al., 2006). To investigate race/ethnicity/gender differences in age trajectories of functional limitations, we modeled random coefficient growth curves within a mixed model (i.e., multilevel) framework. These models are well-suited for the assessment of individual change with age (Raudenbush & Bryk, 2002; Singer & Willett, 2003). Growth curve models estimate individual trajectories based on person-specific initial values of functional limitations (intercepts) and rates of change (slopes) that describe intra-individual patterns of change in disability as a function of age.

Following Singer and Willet (2003), the level 1 or repeated observations equation captured change in functional limitations with age:

$$Y_{ij} = \pi_{0i} + \pi_{1i}\text{Age}_{ij} + \pi_{2i}\text{Age}^2_{ij} + \varepsilon_{ij},$$

where Y_{ij} represents the functional impairment for individual i at occasion j, π_{0i} represents the number of functional limitations at age 51 for individual i, π_{1i} and π_{2i} represent the linear and quadratic terms, respectively, that capture the individual-specific rate of change in number of functional limitations for individual i with each additional year of age, and ε_{ij} represents random error in the measurement of functional limitations for individual i at occasion j.

The level 2 or person-level equation captured race/ethncity/gender differences in the change in functional limitations with age, with adjustments for panel attriton, by including these as predictors for each of the level 1 parameters:

$$\pi_{pi} = \gamma_{p0} + \boldsymbol{\gamma}_{p1}\text{Race/Ethncity/Gender} + \gamma_{p2}\text{Occasions} + \gamma_{p3}\text{Died} + \zeta_{pi},$$

where each *p*th growth parameter (π_p) is a fucntion of an intercept γ_{p0}, which represents the population-level average, a vector of paramters $\boldsymbol{\gamma}_{p1}$ corresponding to each of the five dummy variables for race/ethncity/gender (white male is the reference), with adjustments for the number of occasions individual i was observed (γ_{p2}) and whether that individual died during the

observation period (γ_{p3}), and a random error term ζ_{pi} . Susbsequent models introduced the covariates for early life social origins, adults socioeconomic status, marital status, and health-related behaviors.

We used ordinary least squares models, assuming that the error terms were normality distributed with a mean of zero. Although this distributional assumption was violated due to the slightly skewed distribution of functional limitations (skew =1.29), preliminary analyses with logarithmically- and square root- transformed outcomes, as well as specifying a Poisson distribution, produced comparable results, suggesting that the findings were not sensitive to the normality assumption. To calculate the OLS models, we employed maximum likelihood estimation using the *xtmixed* procedure in Stata® 10.1. This approach has the advantage of being able to incorporate all respondents observed at least once. Under maximum likelihood estimation, Raudenbush and Bryk (2002) note that with attrition: (1) the data may be assumed to be missing at random (MAR), meaning that the probability of missing a time point is independent given the observed data, and (2) this is a reasonable assumption when the observed data include variables related to both attrition and the dependent variable. Assuming the data are MAR, because all of the data were used in the analysis and a fully efficient estimation procedure (maximum likelihood) was utilized, the model estimates were asymptotically unbiased (Raudenbush & Bryk, 2002). This approach is consistent with recent high-quality studies on disparities in health trajectories (e.g., Haas, 2008; Herd, 2006; Shuey & Willson, 2008; Willson, Shuey, & Elder, 2007).

RESULTS

Bivariate Race/Ethnicity/Gender Differences

As expected, race/ethnicity/gender groups were significantly different in the number of

functional limitations at baseline (see Table 1). White men had significantly fewer functional limitations at baseline than any other race/ethnicity/gender group. Black and Mexican American women reported the greatest number of functional limitations at baseline, 3.34 and 3.44 limitations, respectively, and the two groups did not statistically differ from one another. Not surprisingly, across racial/ethnic groups women had more functional limitations at baseline than men of the same race/ethnicity (Laditka & Laditka, 2002; Read & Gorman, 2006). Although not shown in the table, at baseline white women, black men and Mexican American men had similar levels of functional limitations that did not statistically differ.

As is evident from Table 1, racial/ethnic/gender groups also significantly differed in terms of life course capital. Compared to white men, blacks and Mexican Americans had disadvantaged childhoods. Hispanic men and women generally reported more disadvantaged socioeconomic circumstances in early life than did black men and women (comparison not shown). This early life disadvantage was largely similar for men and women within each racial/ethnic group. The pattern of inequality in adult socioeconomic status largely mirrored that in early life—although women were generally more disadvantaged than men of the same race/ethnicity. Although not shown in Table 1, black and Mexican American men were largely similar to one another in terms of earnings, Social Security Income, and labor force participation. Among women, blacks had significantly lower adult socioeconomic status than whites, and Mexican Americans were similarly disadvantaged as blacks in terms of earnings and Social Security Income. While black men and women had significantly more education than Mexican American men and women, respectively, Mexican American men and women had greater net worth. The greater net worth of Mexican American men and women is consistent with the fact that they were more likely to be married and less likely to be divorced than black men and

women (not shown). In fact, Mexican American men were just as likely to be married as white men. Mexican American women were less likely to be married than whites but their higher rates of divorce and widowhood were not statistically significance.

The pattern of racial/ethnic/gender differences in health relative behaviors showed considerable complexity across indicators, consistent with prior studies (Rogers et al., 2000). Compared to white men, blacks and Mexican American women were more likely to be obese. Within racial/ethnic groups, only among blacks were women significantly more likely to be obese than men. Women were less likely than white men and men of the same race/ethnicity to have ever smoked (Table 1) and racial/ethnic minority women were less likely than same race/ethnicity men to be current smokers. Black men were more likely to be current smokers than any other group (not shown). Black and white women were largely similar in their smoking behavior, while Mexican American women were less likely than both to have ever smoked or be a current smoker. Not surprisingly, women were less likely than white men and men of the same race/ethnicity to be heavy drinkers. Black men were more likely than white men to be heavy drinkers (although not statistically different from Mexican American men). Black women were the least likely to be heavy drinkers of any group (not shown). Overall, the pattern of group differences shows the privileged position of white men in later-life and the general disadvantage face by women relative to men. However, the descriptive results also show that there is considerable heterogeneity in life course capital across groups and that disadvantaged is dependent on the indicator and the comparison group.

[Insert Table 1, about here]

Race/Ethnicity/Gender Differences in Trajectories of Functional Limitations

We present estimates from growth curve models of functional limitations in Table 2.

Model 1 contains baseline estimates for the effect of race/ethnicity/gender on the initial level and rate of change in functional limitations controlling for panel attrition. According to these estimates, at age 53, white men had on average 1.07 functional limitations and their number of limitations increased with age (as indicated by the positive coefficient for linear and quadratic change, although only the linear component achieves statistical significance). By age 73, white men had more than doubled their level of functional impairment (2.44 limitations; calculations not shown).

Consistent with the bivariate pattern discussed above, the initial level of functional limitations varied significantly by race/ethnicity/gender and all groups had significantly more functional limitations at baseline than white men. The magnitude of difference was generally smaller among men, with black men having 0.40 more limitations and Mexican American men 0.69 more limitations at age 53 than white men. By contrast, and consistent with the well-known gender disparity in disability (Laditka & Laditka, 2002), women had much higher levels of functional limitations at age 53 than did white men. White women had 0.91 more limitations on average than white men, compared to 1.59 and 1.95 more limitations for black and Mexican American women, respectively. The average differences in functional limitations at baseline by race/ethnicity among men were smaller in magnitude than those among women (not shown), indicating the importance of an intersectionality approach. Mexican American women had the greatest number of functional impairments at baseline with 3.02 limitations—almost three times the level exhibited by white men. Despite these large differences in the initial level of functional limitations, however, the change in functional limitations with age did not vary by race/ethnicity/gender. Net of the controls for panel attrition, none of the race/ethnicity/gender coefficients for the linear and quadratic slope parameters were statistically significant. Thus, the

growth curve estimates in Model 1 indicate that the disparity in functional limitations is constant with age, with each group increasing at roughly the same rate, demonstrating a pattern of persistent inequality as shown in Figure 1.

[Insert Figure 1, about here]

We added controls for early life social origins, adult socioeconomic status, marriage, and health behaviors in Model 2 to determine the extent to which these forms of life course capital can explain the persistent inequality in trajectories of functional limitations across race/ethnicity/gender groups. In preliminary analyses, we added these controls in blocks and because the results were largely similar we present only the combined model here. The estimates from Model 2 indicate that life course capital mediates the association between race/ethnicity/gender and the level of functional limitations at baseline, although the magnitude of mediation varies widely across groups.

Overall, differences in life course capital fully explain racial/ethnic disparities in functional limitations among men but only partially explain those among women—a finding that has appeared in a few prior studies (Mendes de Leon et al., 2005; Read & Gorman, 2006). Net of early life social origins, adult socioeconomic status, marriage and health-related behaviors, black and Mexican American men have trajectories of functional limitations that do not statistically differ from those experiences by white men. Controlling for adult socioeconomic status fully accounted for the higher level of functional limitations among Mexican American men at baseline, while differences in both adult socioeconomic status and health-related behaviors accounted for the disadvantaged faced by black men (not shown).

Controlling for early life social origins, adult socioeconomic status, marriage and health-related behaviors eliminated about 50-60% of the elevated level of functional limitations

experienced by white, black and Mexican American women relative to white men. Although not presented in Table 2, controlling for the various forms of life course capital also eliminated the difference between white and Mexican American women, while black women continued to have higher initial levels of functional limitations. Accounting for socioeconomic status and marriage alone explained a slightly greater percentage of the disparities in functional limitations among women than the complete model with health-related behaviors included. This is not surprising given the generally worse behavioral profiles of men relative to women, but does suggest that the better health-related behaviors of women, overall, keep the gap in functional limitations from being greater by about 12 % for white women and 5-6% for black and Mexican American women (not shown). Interestingly, the results from Model 2 show that net of disparities in life course capital the age trajectories of functional impairment for black women and white men slightly diverged, as the linear growth parameter was statistically significant. Comparisons of the growth curve parameters between black women and other racial/ethnic/gender groups indicated that the increased rate of functional impairment was not due to the choice of reference group, although these other comparison were only marginally statistically significant ($p < .08$; not shown). Supplemental analyses indicated that the greater rate of functional impairment for black women occurred once we controlled for labor force status (not shown). The unique experience of black women highlights the importance of studying health using an intersectionality approach (Kim & Miech, 2009; Mendes de Leon et al., 2005).

Examining estimates of the growth curve parameters across models with alternative reference groups (not shown), largely reinforced the interpretation from the models where white men were the reference. Women had significantly higher initial levels of functional limitations than men across all racial/ethnic groups, although the additional of controls for adult

socioeconomic status reduced this difference among Mexican Americans to marginal significance ($p < .07$). Mexican American women, once the controls were introduced, did not have significantly different levels of functional limitations at baseline compared to white women. Net of life course capital, however, black women had higher levels of functional impairment at baseline than whites, and black and Mexican American men, indicating that something more than socioeconomic inequality is responsible for their higher levels and steeper rates of increase in functional impairment. Regardless of reference group, there were no significant racial/ethnic differences in the level of or change in functional limitations among men, net of control variables.

[Insert Table 2, about here]

Examining the effects of the covariates for life course capital, we found that the effects of early life circumstances, adult socioeconomic status, marriage and health-related behaviors on trajectories of functional impairment were largely consistent with prior studies (Haas, 2008; Kelley-Moore & Ferraro, 2004; Kim & Miech, 2009; Mendes de Leon et al., 2005). Persons who felt their families were poor relative to others when growing up experienced a decelerating increase in functional limitations with age. Adult socioeconomic advantage—education, earnings, and net worth—were all associated with fewer functional limitations at age 53. Persons in the labor force also had fewer functional limitations and those receiving Social Security income had more functional limitations at baseline, although with age the gap between those out of the labor force and not receiving Social Security income, respectively, narrowed. Obese respondents and smokers also had higher levels of baseline functional impairment. Not surprisingly, respondents who died during the observation had significantly more functional limitations at age 53, although, interestingly, they did not experience any more rapid change in

the number of functional limitations than did those who remained alive. The number of measurement occasions was not significantly related to either the initial level of functional limitations or the rate of change.

DISCUSSION

This study made significant advances toward understanding racial/ethnic and gender disparities in health change among older adults. Using data from the 1994-2004 Health and Retirement Study, we took an intersectionality approach, grounded in life course theory, to the study of racial/ethnic/gender disparities in age-trajectories of health. An intersectionality approach stipulates that race/ethnicity and gender mutually define access to life chances and reinforce one another in multiple ways in the production and maintenance of health across the life course (Mullings & Schulz, 2006). Accordingly, we systematically investigated the joint influences of race/ethnicity and gender on age-trajectories of functional limitations among white, black, and Mexican American men and women and examined the extent to which these disparities stem from differential access to life course capital. Similar to prior studies, we found substantial racial/ethnic/gender disparities in the number of functional limitations. White men had the lowest number of functional limitations at baseline, while Mexican American women had the greatest number of functional limitations. The magnitude of difference was narrower among men than among women overall, as black and Mexican American women had substantially more functional limitations than men or white women. Moreover, we found that these initial disparities were constant with age, as each group experienced a similar rate of increase in functional limitations. These results suggest that disparities in disability emerge in midlife and are carried forward into old age (Brown & Warner, 2008), resulting in a pattern of persistent inequality (Ferraro & Farmer, 1996). Our finding of persistent inequality in disability

trajectories among racial/ethnic/gender groups is in contrast to a number of previous studies that have documented divergence in age-trajectories {Kelley-Moore & Ferraro, 2004; Kim & Durden, 2007; Mendes de Leon, et al., 2005; Taylor 2008) and may stem from the fact that we estimated trajectories in a sample of the young-old rather than a sample that contained persons over the age of 75.

According to our findings, dissimilar early life social origins, adult socioeconomic status, marital status, and health behaviors substantially explain the racial/ethnic/gender disparities in functional limitations. However, as suggested by previous studies (Mendes de Leon et al., 2005; Read & Gorman, 2006), these factors explain the racial/ethnic disparities in functional limitations among men but only partially explain the disparities among women. Net of controls for life course capital, women of all racial/ethnic groups have higher levels of functional limitations at baseline relative to white men and men of the same race/ethnicity. The persistence of the gender gap in functional limitations might suggest a biological component to disability, however the absence of gender differences (in self-rated health) in the United Kingdom (Cooper, 2002) somewhat cuts against such a purely biological explanation and indicates the importance of the social context for how health changes with age(Verbrugge, 1989; Verbrugge & Jette, 1994) .

Interestingly, controlling for early life and adult socioeconomic status, white and Mexican American women had similar levels of functional limitations but black women continued have significantly different levels of impairment. Moreover, controlling for adult socioeconomic status (and labor force status in particular) revealed a steeper rate of acceleration in functional limitations with age for black women compared to other racial/ethnic/gender groups more consistent with an interpretation of cumulative disadvantage. The mechanism behind the

higher initial level and rate of acceleration in disability with age for black women is unclear. Prior studies suggest a number of factors—perceived discrimination, elevated levels of stress, segregation in disadvantaged neighborhoods (Collins & Williams, 1999; Geronimus, Hicken, Keene, & Bound, 2006)—that may be at the source of the differential trajectories of functional limitations for black women. Unfortunately, the HRS does not collect information on perceived racism or neighborhood characteristics. Further research is needed to test whether racism and neighborhood context generate black women's disparate disability trajectories.

Our results demonstrate unequivocally that racial/ethnic disparities in disability trajectories are conditioned by gender, the origins of racial/ethnic disparities are gendered, and accordingly an intersectionality approach to the study of health disparities is needed to better understand the social construction of health in later life. In addition to this intersectionality approach, the current study made several methodological improvements over prior examinations and advanced our understanding of inequality in health change. First, we modeled intra-individual change between ages 53 and 73 in terms of *age*-trajectories using data from a narrow set of birth cohorts (1931-1941), which were followed over 10 years and consequently yielded considerable age-overlap across cohorts. By contrast, many prior longitudinal analyses of racial/ethnic and gender disparities have employed accelerated cohort designs to model intra-individual change. Accelerated cohort designs involve an age-heterogeneous initial sample (i.e., many different birth cohorts), that are followed longitudinally and the respondents are treated as a synthetic cohort. Such designs are common in the study of health disparities (see Herd, 2006; Shuey & Willson, 2008; Willson et al., 2007). However, given cohort differences in the exposure to health risks and socioeconomic resources (Costa, 2002), such a modeling approach is problematic when there are few observations and the follow-up period is not lengthy enough to

provide substantial age overlap across cohorts (e.g., Kim & Miech, 2009; Liang et al., 2008). Moreover, mortality selection processes (Dupre, 2007; Warner, 2009) mean that the oldest panel members, from the earliest cohorts, represent a select group of survivors least likely to have functional limitations; this is especially likely to be the case for racial/ethnic minorities and men. Indeed, a second strength of the current study is that within the context of our prospective cohort study we explicitly accounted for mortal and non-mortal panel attrition in the estimation of these age-trajectories.

The present study also advanced our understanding of inequality in health trajectories by examining the experiences of Mexican American men and women. Prior research on disability trajectories has largely focused on differences only between blacks and whites (e.g., Ferraro & Farmer, 1996; Kelley-Moore & Ferraro, 2004; Kim & Miech, 2009; Taylor, 2008) or when not limited to these two groups has examined an amorphous Hispanic category (e.g., Liang et al., 2008). Failure to examine specific Hispanic-origin groups (i.e., Mexican Americans, Puerto Ricans, Cuban Americans, etc.) clouds our understanding of health disparities because both health status and socioeconomic resources vary widely across these groups (see Markides et al., 2007; Read & Gorman, 2006). Documenting health trajectories of older Mexican Americans is especially important given their projected increase as a share of the population over the next several decades (Angel & Whitfield, 2007).

Despite these advances, this study leaves several important questions unaddressed. First, our examination of racial/ethnic/gender disparities in health trajectories was confined to functional limitations. As the nature and magnitude of health disparities depends on the health measure employed (Cooper, 2002; Read & Gorman, 2006), additional studies using an intersectionality approach are needed to examine other health indicators—such as chronic

conditions, self-rated-health and depressive symptoms—to determine whether the racial/ethnic/gender patterns we document here are applicable to a wide array of health phenomena.

Second, we limited our analyses to U.S. born persons so as to eliminate any bias resulting from the healthy immigrant effect or, particularly among Mexican-origin respondents, from return-migration (Palloni & Arias, 2004). Future studies are needed to examine the role of nativity in shaping health trajectories among older adults as the immigrant health advantage is apparent, albeit to differing degrees, across racial/ethnic/gender groups (Hummer, Rogers, Nam, & LeClere, 1999; Palloni & Arias, 2004). Also, as we note above, we limited our analysis to just one group of Hispanics—Mexican Americans. However, it will be important for future with research, with data explicitly suited to such purposes, to examine age-trajectories of health among other Hispanic groups. Prior studies consistently indicate that Puerto Ricans have worse health profiles than Mexican Americans, while Cuban American have better profiles (Read & Gorman, 2006). The extent to which these subgroup differences manifest themselves similarly in a prospective study of health change is unclear.

Finally, although we control for prospective mortal and non-mortal panel attrition, left-censoring may be an issue. Our results presented may be biased given racial/ethnic/gender differences in mortality rates and the fact that health disparities begin to manifest in mid-life (Brown & Warner, 2008; House et al., 1994) prior to inclusion in the HRS sample. Accordingly, our findings are conditional upon survival to midlife (Shuey & Willson, 2008; Warner, 2009) and should be interpreted as such. However, while our findings are conditional on the survival of persons to at least age 53, mortality selection processes are apt to be less severe here than in accelerated cohort designs where survival to age 70 or greater is required for the initial inclusion.

Nevertheless, future research should investigate racial/ethnic/gender differences in health trajectories and the factors that generate them earlier in the life course in order to better understand and eliminate health disparities.

Overall, the present study adds to a small but growing number of empirical examinations of health disparities using an intersectionality approach (e.g., Liang et al., 2008; Mendes de Leon et al., 2005). While a number of prior studies have demonstrated wide disparities in health and functional limitations among racial/ethnic groups (Ferraro & Farmer, 1996; Kelley-Moore & Ferraro, 2004; Kim & Miech, 2009) or between men and women (Anderson et al., 1998; Guralnik & Kaplan, 1989; Kahng et al., 2004), our findings highlight the utility of investigating how race/ethnicity and gender intersect or combine to affect the health of older adults. Race/ethnicity and gender are not separate dimensions of social stratification but rather jointly define both access to the resources that promote health and exposure to the risks that undermine health across the life course (Mullings & Schulz, 2006; Read & Gorman, 2006). The application of an intersectionality approach can yield a more detailed understanding of the social stratification of health and age-related changes in health and will better inform prevention efforts aimed at eliminating what have thus far proven to be entrenched health disparities.

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Table 1. Means for Baseline (1994) Study Variables by Race/Ethnicity/Gender [a,b]

	Whites		Blacks		Mexican Americans	
	Men	Women	Men	Women	Men	Women
Functional Limitations	1.58	2.34*†	2.10*	3.35*†	2.21*	3.44*†
Age	55.80	55.70	55.69	55.76	55.43*	55.21*
Early Life Social Origins						
Family was Poor [c]	0.26	0.24	0.35*	0.33*	0.41*	0.36*
Family was Poor Missing	0.15	0.13*†	0.22*	0.16 †	0.20	0.17
Mother had >H.S. Education	0.10	0.12*†	0.04*	0.04*	0.02*	0.02*
Mother's Education Missing	0.09	0.06*†	0.14*	0.15	0.15	0.09
Father had > H.S. Education	0.13	0.12	0.03*	0.03*	0.01*	0.01*
Father's Education Missing	0.10	0.10	0.21*	0.25	0.15	0.12*
Adult Socioeconomic Status						
Years of Education [d]	12.85	12.53*†	10.93*	11.50*†	9.49*	9.07*
Earnings (Ln) [d]	8.86	7.97*†	7.74*	6.57*†	7.26*	5.82*†
Social Security Income (Ln) [d]	1.42	2.66*†	2.00*	2.94*†	2.23*	3.29*†
Net Worth (Ln) [d]	11.58	11.33*†	7.91*	7.31*†	10.04*	9.32*
In the Labor Force	0.73	0.56*†	0.59*	0.53*†	0.65*	0.49*†
Uninsured	0.08	0.11*†	0.15*	0.19*	0.25*	0.27*
Marital Status						
Married	0.84	0.72*†	0.62*	0.41*†	0.76	0.65*†
Divorced	0.10	0.13*†	0.19*	0.29*†	0.10	0.17*†
Widowed	0.02	0.11*†	0.07*	0.22*†	0.02	0.14*†
Never Married	0.03	0.03	0.07*	0.07*	0.02	0.04
Health-Related Behaviors						
Obese (BMI ≥ 30)	0.23	0.21	0.27*	0.42*†	0.29	0.31*
Ever Smoked	0.74	0.56*†	0.74	0.57*†	0.82	0.47*†
Currently Smokes	0.24	0.24	0.36*	0.21 †	0.25	0.20*†
Heavy Drinker (3+ Drinks/Day)	0.09	0.02*†	0.12*	0.01*†	0.12	0.02* †
Attrition						
Measurement Occasions	5.72	5.98*†	5.19*	5.67 †	5.56	5.74
Died during Observation	0.17	0.10*†	0.27*	0.18 †	0.14*	0.13
N	3032	3204	605	847	138	139

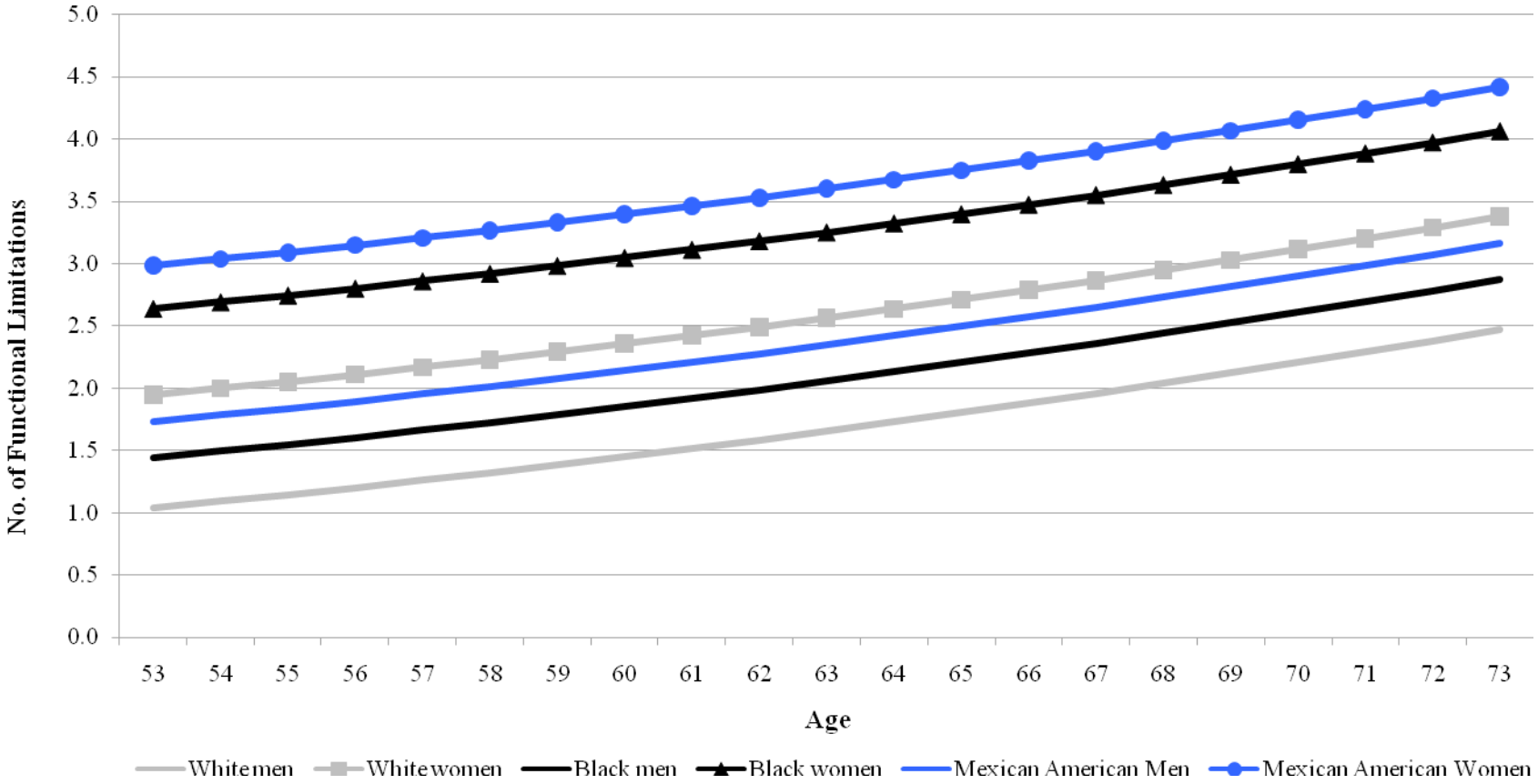
Notes: [a] Means for dummy variables can be interpreted as the proportion of the sample coded 1 on that indicator; [b] Statistical significant differences (p <.05) between racial/ethnic/gender group and White Men are denoted by an *; Statistical significant differences (p <.05) between men and women with racial/ethnic groups are denoted by a †; [c] Variable was measured in 1998; [d] Mean value for original, non-centered, variable.

Table 2. Race/Ethnicity/Gender Trajectories of Functional Limitations Among Adults Ages 53-73: Random Coefficient Growth Curve Models (N=7965)

	Model 1			Model 2		
Fixed Effects [a]	Initial Status	Linear Change	Quadratic	Initial Status	Linear Change	Quadratic
Intercept	1.0735***	0.0514**	0.0010	2.6713***	-0.1594***	0.0087***
Race/Ethnicity/Gender Group						
White Women	0.9077***	-0.0217	0.0014	0.4595***	0.0280	0.0000
Black Men	0.4028*	-0.0190	0.0018	-0.3154	0.0059	0.0010
Black Women	1.5905***	0.0351	-0.0022	0.6689***	0.0823**	-0.0032
Mexican American Men	0.6946*	-0.0428	0.0036	-0.1957	-0.0395	0.0036
Mexican American Women	1.9463***	-0.0431	0.0005	0.7954**	0.0007	-0.0007
Early Life Social Origins						
Family was Poor				0.1432	0.0401*	-0.0023*
Mother had > H.S. Education				-0.0283	-0.0008	-0.0003
Father had > H.S. Education				-0.0629	-0.0296	0.0022
Adult Socioeconomic Status						
Years of Education				-0.1224***	-0.0059	0.0002
Earnings (Ln)				-0.0317**	0.0033	-0.0001
Social Security Income (Ln)				0.1094***	-0.0140***	0.0005*
Net Worth (Ln)				-0.0361***	0.0010	-0.0001
In the Labor Force				-1.4493***	0.1573***	-0.0056***
Uninsured				-0.0375	-0.0052	0.0005
Marital Status						
Divorced				0.1862	0.0332	-0.0029*
Widowed				0.2206	-0.0303	0.0010
Never Married				-0.1839	0.0527	-0.0013
Health-Related Behaviors						
Obese (BMI ≥ 30)				0.3312***	-0.0037	0.0010
Ever Smoked				0.3352***	0.0214	-0.0010
Currently Smokes				-0.3085**	0.0375	-0.0021
Heavy Drinker (3+ Drinks/Day)				0.0754	0.0345	-0.0014
Attrition						
Measurement Occasions	-0.0018	-0.0013	0.0001	0.0722	-0.0035	0.0002
Died during Observation	1.4755***	0.0401	0.0026	0.9623***	0.0400	0.0034
Random Effects						
Level 1 Residual	1.3972***			1.3955***		
Level 2 Age	0.2481***			0.2481***		
Level 2 Age^2	0.0114***			0.0116***		
Level 2 Intercept	2.1896***			1.7656***		
Log Likelihood		-83301.98			-81735.32	

Notes: [a] Models also control for missing on Family was Poor, Mother's Education, and Father's Education.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 1. Age-Trajectories of Functional Limitations by Race/Ethnicity/Gender, Growth Curve Model Estimates Using the 1994-2004 Health and Retirement Study [a]



Note: [a] Age-trajectories are those implied for respondents observed at all interview waves and plotted using statistically significant coefficients in Model 1 of Table 2; All groups are significant different.