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The Black/White Disability Gap: Persistent Inequality in Later Life?

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Objectives. Previous research on differences between Black and White older adults has produced inconsistent results on whether a gap in disability exists and whether it persists over time. The present research identifies several reasons for the inconsistent results to date and examines Black/White differences in disability trajectories over 6 years.

Methods. Data from the North Carolina Established Populations for the Epidemiologic Studies of the Elderly (1986–1992) are used to estimate the disability gap and trajectory over time for both Black and White older adults.

Results. Results indicate that a disability gap between Black and White adults exists, but after socioeconomic resources, social integration, and other health indicators are adjusted for, the trajectories of disability by race are not significantly different. Controlling for incident morbidity over time accounts for the significant difference in level of disability between the two groups.

Discussion. This research supports the "persistent inequality" interpretation, indicating that Black adults have higher morbidity and disability earlier in life compared with White adults, and that the gap neither converges nor diverges over time.

SOCIOLOGICAL, epidemiologic, and clinical research has consistently shown that there is a glaring difference in health between White and Black Americans. Black adults have consistently poorer health, fewer visits to a doctor, and higher mortality rates for a wide range of conditions (Clark & Maddox, 1992; Hummer, 1996). Black Americans are more likely to have longer hospital stays and more days sick in bed than White Americans (Liao, McGee, Cao, & Cooper, 1999). In addition, Black adults are at higher risk for most types of cancer, diabetes, cardiovascular disease, and stroke than their White counterparts (Manton & Stallard, 1997).

The evidence regarding racial differences in disability during later life, however, has been less clear. A number of studies have shown that Black older adults have much poorer physical functioning than White older adults, indicating that a disability gap exists (Clark & Maddox, 1992; Ferraro, Farmer, & Wybraniec, 1997; Ostchega, Harris, Hirsch, Parsons, & Kington, 2000; Schoenbaum & Waidmann, 1997). Some research shows that the disability gap increases over time (Clark, 1997; Liao et al. 1999), and other research shows that the gap decreases and even converges among the oldest old (Clark, Maddox, & Steinhauser, 1993; Gibson, 1991; Guralnik, Land, Blazer, Fillenbaum, & Branch, 1993; Johnson, 2000; Mendes de Leon et al., 1997). The disability gap goes beyond convergence in the later years, some argue, such that a "disability crossover" emerges around age 80, at which point surviving Black adults have better physical functioning than their White counterparts (Clark, 1996; Clark & Maddox, 1992; Guralnik, Land, et al., 1993; Johnson, 2000).

Given the inconsistency in the results to date, further research is needed to clarify whether aging amplifies, reduces, or maintains earlier inequalities. The purpose of this article is to identify reasons for the inconsistent results and examine Black/White differences in disability trajectories over time.

The Black/White Disability Gap: Why the Inconsistent Results?

To better understand the inconsistent results, we find it important to note that there are theoretical or conceptual frameworks that support either amplification or reduction of the gap. Most of the research pointing to a widening of the disability gap in later life is premised upon a cumulative disadvantage perspective (Dannefer, 1987). It is widely understood that many Black people experience a cascade of disadvantages from birth to later life. Many of these disadvantages are related to economic inequality, but they are interwoven in other systems of stratification. Cumulative disadvantage theory holds that there are enduring effects of these early experiences. People are set on health trajectories as a result of disadvantages experienced across the life course, and the effects amplify in later years. Indeed, this idea bears much resemblance to the double jeopardy hypothesis in studies of minority aging, but that hypothesis specifies older adulthood itself as a key disadvantage (Bengtson, Burgess, & Parrott, 1997; Dowd & Bengtson, 1978; Ferraro & Farmer, 1996).

In contrast, convergence of health inequality in later life is often seen as a matter of selective survival. Whereas Black persons have higher mortality in the early years, a more select set of them reaches older ages, when compared with White persons. This has also been coupled with hardiness (Williams & Lawler, 2001) and acquired-immunity hypotheses (Preston, Hill, & Drevenstedt, 1998), suggesting that older Black persons are, to some degree, a survivor elite. Moreover, in sample surveys, there is the added concern of selective sampling, whereby nonrespondents are more likely to be disadvantaged (e.g., physically or cognitively impaired). In short, failure to consider differential racial mortality—and nonrandom selection, more generally—may give the appearance of decreasing health disparities.

Beyond the conceptual frameworks used, there are several substantive and methodological issues that may account for the inconsistency in the empirical literature. First, race differences in disability among older adults have often been attributed to differences in socioeconomic status. In fact, some researchers find that the disability gap does not exist—or is greatly reduced—after they account for differences in education and income among Black and White adults (Guralnik, Land, et al., 1993; Liao et al., 1999; Schoenbaum & Waidmann, 1997; White-Means & Hammond, 1993). However, not all findings are consistent with this premise, indicating that other risk factors in addition to socioeconomic status contribute to the racial disability gap (Clark & Maddox, 1992; Clark et al., 1993; Liao et al., 1999; Mendes de Leon et al., 1997). The issue may be which measures of socioeconomic status are considered. The mechanisms linking socioeconomic status to health have been shown to be different for Black and White older adults, underscoring the need for a multidimensional approach to the measurement of socioeconomic status (Schoenbaum & Waidmann, 1997). Many studies use only one or two indicators, typically education, income, or both (Clark et al., 1993; Mendes de Leon et al., 1997). Income, although important, gives only part of the economic picture because wealth accumulation is critical to understanding consumption patterns and lifestyle choices of older people. Occupational history may also be important for understanding disability because certain types of work are associated with physical demands that may accelerate or prevent disability.

Second, morbidity is seen as the key antecedent of disability, and specific health conditions such as diabetes, stroke, hip fracture, and heart attack may lead to a sharp increase in disability (Guralnik, LaCroix, et al., 1993; Guralnik, LaCroix, Branch, Kasl, & Wallace, 1991). As Verbrugge and Jette (1994) describe it, pathology is the first stage of the disablement process. Most of the longitudinal studies examine the effects of initial morbidity on subsequent disability (Clark, 1996; Liao et al., 1999; Mendes de Leon et al., 1997). If Black adults have higher incident morbidity, failure to account for it may lead investigators to miss an important part of the disablement process. One study that incorporated change in morbidity found that it was part of an overall spiral of health decline (Ferraro et al., 1997). Although that investigation made use of a count of comorbidity, it may be useful to next consider the effects of specific diseases on disability, especially because of the distinct morbidity profiles of Black and White older adults.

The way previous researchers have treated morbidity, socioeconomic status, and the relationship between them may well account for much of the inconsistency in findings on the Black/White disability gap. Nevertheless, there are two methodological limitations that may add to the inconsistency. First, much of the research examining Black/White differences in disability has been conducted on single-wave samples (Ostchega, et al., 2000; Schoenbaum & Waidmann, 1997; White-Means & Hammond, 1993) or panel studies of few or short follow-ups (Guralnik, Land, et al., 1993; Johnson, 2000; Seeman et al., 1994). Morbidity incidence and subsequent disability require time to fully develop and may not be detected when all measures are collected at the same time point or when the time lag is too short.

Second, panel data, especially with three or more waves, are excellent for studying the disablement process, but they also entail the complication of attrition. Death, refusal, and loss to follow-up could potentially reduce the number of subjects at subsequent waves, and attrition is likely to be nonrandom (Lillard & Panis, 1998). Black Americans, older adults, less healthy persons, and men have higher mortality rates, increasing the likelihood that the remaining sample will be disproportionately White Americans, younger adults, healthier persons, and women (Guralnik, Land, et al., 1993). With few exceptions (e.g., Mendes de Leon et al., 1997), previous research on race differences in disability has not accounted for potential selection bias that is due to attrition. The likely consequence is that the gap in disability between Black and White adults over time may be underestimated because the remaining sample is younger and healthier.

The present research seeks to help resolve the inconsistency in research findings on the Black/White disability gap in later life by addressing the limitations of previous research enumerated herein. A fuller, although not comprehensive, set of socioeconomic status (SES) variables is examined. Morbidity, including incident morbidity over six follow-up periods, is considered in studying the disablement process. Disability trajectories are estimated with structural equation models while accounting for attrition. The research focuses on three questions. First, does a disability gap exist between Black and White older adults? If yes, two additional questions follow logically. Does the gap widen, shrink (perhaps to the point of reversing the gap), or remain stable over time? Does current or incident morbidity narrow or account for the racial disparity in disability among older adults? Consistent with the cumulative disadvantage perspective, it is hypothesized that the racial disability gap exists in later life and will widen over time. It is anticipated that race differences in the number of prevalent health conditions will most likely account for much of the racial disability gap, relative to incident morbidity, but that selected health conditions that develop during the course of the study (e.g., stroke) will heighten disability.

Methods

Sample

This research uses data from the North Carolina Established Populations for the Epidemiologic Studies of the Elderly (EPESE). Residents were sampled from five counties in North Carolina to reflect urban and rural counties in the Southeast United States. Baseline data were collected in household interviews in 1986, and six subsequent annual waves were collected between 1987 and 1992. Black Americans were oversampled so that the final sample of 4,162 adults aged 65 years and older includes 2,257 African Americans (54%). The sample also includes 26 persons who were not classified as Black or White. These persons were combined with the White subjects in the file that was archived with the Interuniversity Consortium for Political and Social Research. Thus, it is impossible to identify these cases in the publicly available data. Thirty-five percent of the sample did not complete all seven waves, leaving 2,567 respondents at the seventh interview. Of those who did not finish the study, only 129 did not due to refusal or loss to follow-up; the vast majority of attrition was due to death. Details of the sampling and interviewing procedures can be found in the article by Cornoni-Huntley and colleagues (1993).

Table 1. Coding and Descriptive Statistics for Black and White Adults and the Total Sample

Variables	Coding	Total	Black Adults	White Adults
Disability				
W1	0 = none; 14 = unable to do all ADL tasks	0.56 (1.57)	0.61 (1.62)	0.51 (1.51)*
W2	0 = none; 14 = unable to do all ADL tasks	0.53 (1.64)	0.55 (1.61)	0.50 (1.67)
W3	0 = none; 14 = unable to do all ADL tasks	0.57 (1.64)	0.61 (1.68)	0.52 (1.59)*
W4	0 = none; 14 = unable to do all ADL tasks	0.83 (2.05)	0.87 (2.02)	0.78 (2.07)
W5	0 = none; 14 = unable to do all ADL tasks	0.84 (2.00)	0.92 (2.07)	0.73 (1.93)**
W6	0 = none; 14 = unable to do all ADL tasks	0.91 (2.13)	1.01 (2.21)	0.80 (2.02)**
W7	0 = none; 14 = unable to do all ADL tasks	1.09 (2.48)	1.23 (2.60)	0.93 (2.31)***
Female	1 = female; 0 = male	0.65	0.65	0.65
Black	1 = Black; 0 = White	0.54	—	—
Age	Ranges from 64 to 105	73.55 (6.72)	73.62 (6.85)	73.48 (6.57)
Education	1 = 0–7 years; 4 = 12+ years	1.90 (1.04)	1.63 (.92)	2.23 (1.08)***
Income	1 = <$5,000; 5 = $15,000+	2.45 (1.55)	1.91 (1.28)	3.11 (1.59)***
Rural	1 = yes; 0 = other	0.44	0.44	0.45
Married	1 = yes; 0 = other	0.38	0.35	0.43***
Widowed	1 = yes; 0 = other	0.49	0.51	0.47***
Employed	1 = yes; 0 = other	0.12	0.12	0.12
Owns home	1 = yes; 0 = other	0.62	0.50	0.71***
Prof. career	1 = yes; 0 = other	0.07	0.06	0.09***
Labor career	1 = yes; 0 = other	0.08	0.09	0.07***
Freq. attend religious services	1 = never; 6 = more than once/week	4.00 (1.72)	4.15 (1.57)	3.82 (1.86)***
Total living children	0 = none; 5 = 5 or more	2.67 (1.79)	2.95 (1.90)	2.33 (1.59)***
Close relatives	0 = none; 3 = 3 or more	2.13 (1.11)	2.15 (1.10)	2.12 (1.12)
Lives alone	1 = yes; 0 = other	0.38	0.35	0.41***
Depression	Ranges from 0 to 20	3.11 (3.41)	3.25 (3.35)	2.95 (3.48)**
Smoker				
Current	1 = yes; 0 = other	0.17	0.16	0.18
Past	1 = yes; 0 = other	0.26	0.23	0.30***
Incontinent	1 = never; 5 = all the time	2.02 (1.12)	2.01 (1.12)	2.03 (1.13)
Heart trouble	1 = yes; 0 = other	0.12	0.11	0.14***
Stroke	1 = yes; 0 = other	0.08	0.09	0.07*
High blood pressure	1 = yes; 0 = other	0.54	0.60	0.48***
Diabetes	1 = yes; 0 = other	0.18	0.22	0.13***
Hip fracture	1 = yes; 0 = other	0.04	0.02	0.05***
Broken bones	1 = yes; 0 = other	0.21	0.16	0.27***
Cancer	1 = yes; 0 = other	0.10	0.06	0.15***

Notes: Means (and standard deviations) are given. Coding and statistics are for the North Carolina Established Populations for the Epidemiologic Studies of the Elderly, 1986–1992. Significant differences in estimates between Black and White older adults are tested with *t* tests for continuous and ordinal variables and chi-square for binary variables. Total, $N = 2,481$; Blacks, $n = 1,355$; Whites, $n = 1,126$. ADL = activity of daily living.

*Estimates are significantly different at $p < .05$.

**Estimates are significantly different at $p < .01$.

***Estimates are significantly different at $p < .001$.

Measurement

Table 1 contains all of the variables, the coding, means, and standard deviations for the total sample and separately for Black and White adults. The dependent variable for these analyses is disability and is based on respondents' reports of their level of ability to perform seven activities of daily living (ADLs): walking, eating, dressing, grooming, transferring to a chair from the bed, bathing, and using the toilet (Katz, Ford, Moskowitz, Jackson, & Jaffee, 1963). There were three possible response categories: able to perform the task without help (0), able to perform the task with some help (1), or unable to perform the task independently (2). The questions about physical function at baseline asked participants if they had trouble any time in the preceding 12 months. A follow-up question asked if the participants still had trouble performing the task. Respondents who needed help in the previous year but did not currently require aid to perform the task were considered to be independent and were coded as 0. This made the measures at baseline consistent with each of the follow-up interviews, which capture current dependencies only. The responses from the seven ADL tasks (within the same wave) were then summed, creating a single measure of disability ranging from 0, meaning the respondent needed no help in any domain, to 14, meaning the respondent could not perform any of the tasks independently ($\alpha = .89$). This measure is identical at all seven waves. There were 86 respondents who were alive and interviewed but did not answer the ADL questions at one or more waves.

Socioeconomic status is measured with several variables. Education has four categories: 0 to 7 years (1); 8 to 11 years (2); 12 years (3); and more than 12 years (4). Total family income is measured with five categories ranging from less than $5,000 (1); $5,000 to $6,999 (2); $7,000 to $9,999 (3); $10,000 to $14,999 (4); and $15,000 or more (5). As a

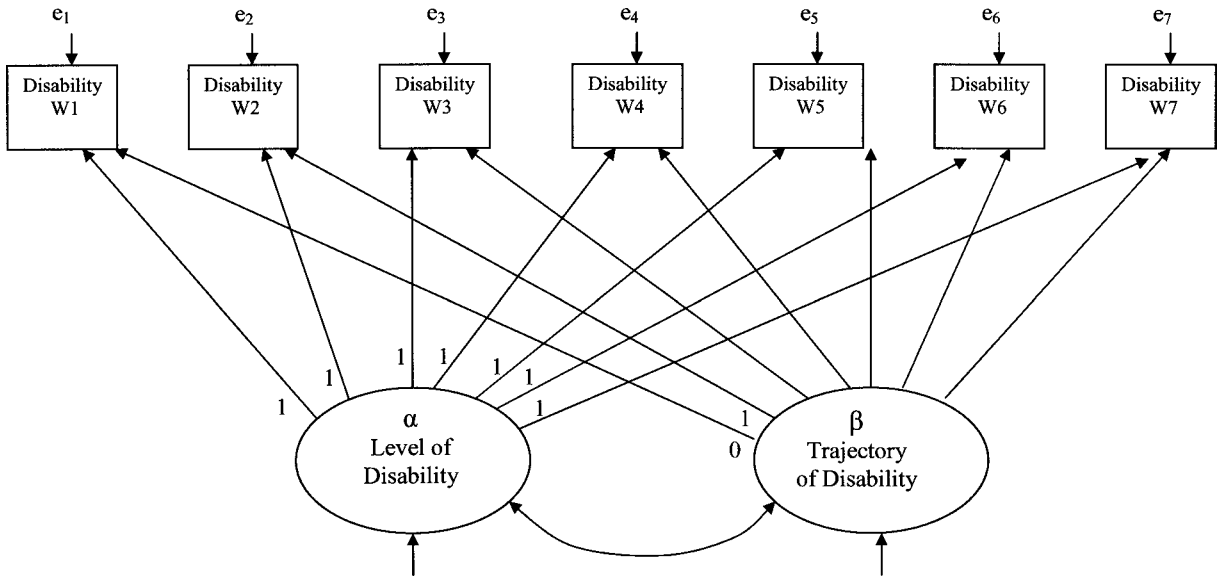

Figure 1. Conceptual latent growth model of disability over 7 years: North Carolina Established Populations for the Epidemiologic Studies of the Elderly, 1986–1992. The latent construct for the level has fixed paths to each measure of disability: the value of 1 for the path to disability at each wave. The latent construct for the slope has fixed paths for the first two measures of disability, 0 and 1, respectively, to set the metric of the slope (McArdle & Hamagami, 1991). Each subsequent disability measure is fixed to a consecutively higher number (2, 3, etc.) to estimate the linear slope.

measure of wealth, these models include an indicator for whether the respondent owns his or her home. Those who own their home are coded as 1; all others are coded as 0. Measures of employment are also included. Those who were currently employed at baseline are identified in a dichotomous variable (1 = employed; 0 = not employed). Respondents were also asked the primary type of work they performed during their years of employment. Only two were significant in preliminary models and were therefore retained: professional career and labor career. Both are coded so that 1 equals the name of the variable and 0 is used for all others. The reference group for these analyses includes those who performed primarily retail, service, managerial, or operative work during years of employment.

Several indicators of social integration were included in these analyses. Marital status was identified with two binary variables: married and widowed. In both cases, those with that marital status were coded as 1. All others were coded as 0. Frequency of religious service attendance ranged from never (1) to more than once a week (6). Total number of living children ranges from none (0) to five or more (5). Respondents were also asked the following question: "Other than your children, how many relatives do you have that you feel close to?" The response categories range from none (0) to 5 or more (3). Those who live alone were identified with the value of 1 in a binary variable. All others were coded as 0.

Self-reported depression is measured with a sum of 20 items from the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). Respondents were asked about their general feelings in the past month, such as whether they enjoyed life, had the blues, had restless sleep, or felt people disliked them, with possible responses being "yes" (1) or "no" (0). Four items were reverse coded and all 20 items were then summed. Higher scores indicate higher levels of depressive symptomatology or depressive mood.

Several indicators of health status and behavior, including seven existing health conditions, were also measured in these analyses. Respondents were asked if they had ever been told by medical personnel that they had cancer, heart trouble (including heart attack), stroke, high blood pressure, diabetes, hip fracture, or broken bones. Each is coded as 1 if the condition is present and 0 if not. Incontinence is measured separately and ranges from never (1) to all of the time (5). Current smokers and past smokers were each identified with binary variables.

Demographic variables include being Black, being female, and living in a rural area. All three are binary variables, in which 1 equals the name of the variable. All others are coded as 0. Age ranges from 64 to 105 years.

Analysis

The first stage of the analysis uses the continuous measures of disability at all seven waves to estimate the overall level and trajectory of disability. These trajectories are estimated by using latent growth curves in structural equation models. Individual change in disability is modeled as a function of time and is then used to estimate change in disability for the total sample (Bollen & Curran, 2001; Meredith & Tisak, 1990; Willett & Sayer, 1994).

Figure 1 illustrates the proposed measurement model of the trajectory of disability over time. Both of the latent constructs have seven indicators of disability, one at each wave. Level is a latent construct of the average level of disability for all 7 years. Trajectory is a latent construct of the rate of change in disability over time. A nonlinear trajectory, where the paths to the third through seventh wave disability measures are freely estimated rather than fixed to a particular value, was tested but

Table 2. Comparisons of Model Fit, Level, and Trajectory of Disability Across Models

Model Statistic	Model 1: Basic	Model 2: All Covar.	Model 3: All Covar.		Model 4: Incid. Morbidity
			Black Adults	White Adults	
Chi-square (*df*)	323.88 (24)	191.92 (151)	367.74 (296)		522.36 (302)
RMSEA	0.05	0.01	0.01		0.01
IFI	0.99	1.00	1.00		1.00
GFI	0.99	0.99	0.99	0.99	0.99
AGFI	0.97	0.97	—	—	0.98
N or *n*	2,459	2,459	1,355	1,104	2,459
Level	0.48	0.47	0.51	0.42	0.46
Trajectory	0.10	0.11	0.12	0.10	0.11

Notes: Table is for the North Carolina Established Populations for the Epidemiologic Study of the Elderly, 1986–1992. RMSEA = root mean square error of approximation; IFI = incremental fit index; GFI = goodness of fit index; and AGFI = adjusted goodness of fit index.

was not a significantly better fit than the linear slope. In the full model, both latent constructs of level and trajectory are regressed on baseline exogenous covariates. Key instrumental variables in the models are noted in the tables.

The research questions of whether a disability gap exists between Black and White older adults and what happens to that gap over time are tested by estimating a measurement model of the disability trajectory for the total sample, with only race, gender, and age as exogenous covariates. If a gap does exist, full models are then estimated with socioeconomic resources, social integration, and morbidity indicators to test whether these covariates account for the racial health disparity. The final stage of these analyses is to test the time-varying impact of incident morbidity on disability and determine whether accounting for the temporal effect of this relationship explains the remaining racial disability gap. The level and trajectory of disability are estimated in the manner described herein, but incident health conditions (since the previous wave) are lagged to estimate disability at the subsequent wave. This provides adjusted estimates of disability prior to the calculation of the level and trajectory (Sayer & Cumsille, 2001).

In this sample of older adults, there is significant attrition. Each model is adjusted for nonrandom attrition by using a hazard rate instrument based on the inverse Mills ratio expressing the likelihood of not remaining in the study for all seven waves (Heckman, 1979). A probit equation estimates the likelihood of completing all seven waves of the study. Based on that likelihood, an inverse Mills ratio is calculated for each case so that high values indicate a strong likelihood of not completing the study. This variable is entered into the substantive model as a covariate (Berk, 1983).

There are several advantages to the latent growth curve procedure for these analyses. First, no assumption about the linearity of the disablement process over time is required, and this is actually tested. Second, it incorporates information from all seven waves of data simultaneously in the same model instead of simply capturing change between end points or consecutive pairs of survey waves. Third, the latent growth curve models can incorporate time-varying covariates, capturing change that occurred during the study.

Results

For the research questions in this article to be answered, four separate latent growth curve models were estimated. Table 2 contains comparisons of model fit across all four models; Tables 3 and 4 present the estimates of the covariates for each model. Model fit across all four models will be compared first, followed by a discussion of the covariates in each individual model.

Model 1 is the basic disability model, with only race, sex, and age as exogenous covariates. Model statistics indicate a fairly good fit. The goodness of fit index and the incremental fit index are both .99. The root mean square error of approximation (RMSEA) is .05, which is at the threshold for acceptance (Kelloway, 1998). The level, which is .48, is the adjusted mean of disability for 7 years. The adjusted slope, .10, is the rate of change in disability over time. This means that for each year, the average change in disability is an increase of .10.

Model 2 enters all of the covariates into the model and reestimates the level and slope. Model fit improved from Model 1. The RMSEA decreased to .01 and the incremental fit index increased to 1.00. The adjusted level of disability slightly decreased, and the slope slightly increased. Model 3 uses a multigroup estimation for Black and White adults, controlling for all of the covariates in Model 2. Model fit is again strong; the RMSEA value is equal to .01 and the goodness of fit index for both groups is .99. Black older adults have a significantly higher level of disability than White older adults, but after the covariates are controlled for, the slope is not significantly different by race.

Model 4 extends the analysis by including incident morbidity between waves as covariates. Chi-square is 522.36 with 302 degrees of freedom. The incremental fit index is 1.00 and the RMSEA is .01. This is an excellent fit, especially for a second-order latent growth model because of the addition of another level of latent variables (Sayer & Cumsille, 2001).

Table 3 contains the estimates for Models 1, 2, and 3. For each latent growth curve model, results presented are the estimates of the covariates on the level and slope for disability over time. When sex and age are accounted for, Black older adults are significantly more likely to have higher levels of disability and steeper slopes over the observation period. This means that the disability gap does indeed exist, with Black older adults having significantly higher levels of overall disability. In addition, Black older adults have a significantly steeper trajectory of disability, indicating that their levels of disability increase at a faster rate than those of White older adults. This provides evidence that the disability gap continues to widen over time.

As shown in Table 3, Model 2 introduces all of the covari-

Table 3. Model Estimates of the Level and Trajectory of Disability for Black and White Adults and the Total Sample

	Model 1: Basic		Model 2: All Cov.		Model 3			
					Black Adults		White Adults	
Variables	Level	Trajectory	Level	Trajectory	Level	Trajectory	Level	Trajectory
Female	1.48***[a] (.06)	0.09*** (.02)	0.14 (.09)	−0.11 (.09)	.08 (.09)	−.03 (.10)	.22* (.10)	−.15 (.09)
Black	0.36*** (.04)	0.05*** (.01)	0.16* (.08)	0.02 (.08)	—	—	—	—
Age	0.01*** (.001)	0.01*** (.001)	−0.001 (.001)	0.01*** (.001)	0.001 (.001)	0.003*** (.001)	−0.001 (.001)	0.01***[c] (.001)
Education	—	—	0.01 (.01)	−0.003 (.002)	−0.01 (.007)	0.001 (.003)	0.01 (.01)	−0.004 (.003)
Income	—	—	−0.01 (.02)	0.01 (.02)	−0.01 (.02)	−0.001 (.01)	−0.01 (.02)	−0.02 (.02)
Rural	—	—	−0.20** (.07)	0.16* (.07)	−0.20* (.08)	0.01 (.02)	−0.05 (.08)[c]	0.13 (.13)
Married	—	—	0.07 (.09)	−0.15 (.09)	−0.06 (.06)	−0.29** (.10)	0.16 (.10)	−0.12[c] (.09)
Widowed	—	—	—	0.08[b] (.08)	—	0.11[b] (.09)	—	0.05[b] (.09)
Employed	—	—	−0.50*** (.12)	−0.10 (.12)	−0.69*** (.13)	−0.06 (.12)	−0.33**[c] (.14)	−0.26* (.13)
Owns home	—	—	−0.21*** (.04)	0.001 (.02)	−0.13 (.08)	0.03 (.08)	−0.23**[c] (.09)	−0.01 (.08)
Prof. career	—	—	−0.08 (.17)	−0.42** (.18)	0.47* (.22)	−0.77*** (.24)	−0.24[c] (.18)	−0.20[c] (.17)
Labor career	—	—	−0.37* (.16)	0.06 (.16)	0.14 (.16)	−0.30 (.16)	−0.55* (.25)	0.78***[c] (.24)
Freq. attend religious services	—	—	−0.09*** (.02)	0.01 (.20)	−0.09*** (.02)	0.02 (.03)	−0.09*** (.02)	0.004 (.02)
Total living children	—	—	−0.003 (.003)	0.004 (.004)	−0.002 (.003)	0.001 (.001)	−0.01 (.01)	0.01 (.09)
Close relatives	—	—	−0.01[b] (01)	—	−0.01[b] (.01)	—	−0.02[b] (.01)	—
Lives alone	—	—	−0.21** (.08)	0.09 (.08)	−0.11 (.09)	0.11 (.08)	−0.18 (.10)	0.12 (.09)
Depression	—	—	0.01** (.003)	0.001 (.001)	0.01** (.003)	0.001 (.001)	0.01** (.003)	0.001 (.01)
Smoker								
Current	—	—	−0.32** (.11)	0.03 (.14)	−0.33** (.13)	−0.03 (.03)	−0.55*** (.12)	0.07 (.05)
Past	—	—	−0.08 (.10)	−0.05 (.10)	−0.20 (.12)	0.04 (.12)	−0.18 (.10)	−0.11 (.12)
Incontinent	—	—	0.14*** (.03)	0.001 (.01)	0.15*** (.03)	−0.01 (.03)	0.14*** (.04)	0.01 (.03)
Heart trouble	—	—	0.20 (.11)	0.03 (.11)	0.09 (.13)	−0.01 (.03)	0.08 (.11)	−0.03 (.14)
Stroke	—	—	0.59*** (.14)	−0.06 (.13)	0.58*** (.14)	−0.14 (.13)	1.21*** (.20)	0.01 (.09)
High blood pressure	—	—	0.14* (.07)	−0.12 (.07)	0.02 (.05)	−0.06 (.08)	0.17*[c] (.08)	−0.12 (.07)
Diabetes	—	—	−0.03 (.05)	0.27** (.09)	−0.09 (.06)	0.29*** (.10)	−0.37**[c] (.12)	0.38***[c] (.11)
Hip fracture	—	—	1.51*** (.19)	−0.28 (.19)	1.79*** (.17)	−0.15 (.26)	1.65***[c] (.22)	−0.35 (.20)
Broken bones	—	—	0.10 (.09)	−0.09 (.10)	0.15 (.15)	−0.23** (.10)	0.07 (.06)	−0.003[c] (.09)
Cancer	—	—	0.10 (.12)	−0.19 (.15)	−0.01 (.10)	−0.37* (.16)	0.10 (.11)	−0.07 (.11)
Attrition λ	26.54*** (.94)	1.56*** (.31)	2.17 (1.31)	2.83* (1.32)	2.98* (1.46)	3.40** (1.31)	1.47[c] (1.50)	2.89*[c] (1.28)

Note: Table is for the North Carolina Established Populations for the Epidemiologic Studies of the Elderly, 1986–1992.

[a]Slope coefficient (standard error).

[b]Instrumental variable.

[c]Significantly different slope coefficient from the respective equation for Black adults ($p < .05$). Tested by imposing equality constraints on one covariate at a time across groups. If the chi-square difference with 1 *df* exceeded 3.84, then it was concluded that the slope coefficients were significantly different for Black and White older adults.

*$p < .05$; **$p < .01$; ***$p < .001$.

ates into the model, including socioeconomic resources, social integration, and baseline morbidity. This model also includes the adjustment for nonrandom attrition. The separate sample analysis (Model 3) reveals that when SES and other covariates are controlled for, Black older adults are more likely than White older adults to have a higher level of disability (.51 vs. .42) but no longer have a significantly steeper slope (.12 vs. .10) than White adults. This means that Black adults have a higher average level of disability and that the gap persists over time, neither increasing nor decreasing. Other predictors of a higher level of disability are being depressed, being incontinent, having had a stroke, having high blood pressure, or having a hip fracture. A significantly lower level of disability was predicted by living in a rural area, being employed at baseline, having had a labor career, being a homeowner, attending religious services more frequently, not living alone, and being a current smoker.

The trajectory or slope of disability over time is higher for older adults, those with diabetes at baseline, those who live in a rural area, and those who did not have a professional career. The slope of disability was also significantly predicted by the hazard rate variable for attrition. The relationship was positive, indicating that persons who were at the highest risk of attrition had steeper disability slopes. In short, disability estimates in panel data without an adjustment for nonrandom attrition likely underestimate true health disparities.

Model 3 estimates the level and slope of disability separately for Black and White adults, using the multigroup method in LISREL 8.5. Both groups share many of the same predictors of the level and slope of disability. Current employment, frequent attendance at religious services, and current smoking at baseline predict lower levels of overall disability. Being depressed, being incontinent, and having had a stroke or a hip fracture are predictive of higher levels of overall disability for both Black and White adults. The trajectory of disability over time is higher among the oldest Black and White adults, those who are not married, and those with diabetes.

Several covariates, however, are not consistent across race groups. Even though the relationships were significant for one

Table 4. Model Estimates of the Level and Trajectory of Disability With Wave-Specific Incident Morbidity (Model 4)

Variability	Level	Trajectory	Dis. W1	Dis. W2	Dis. W3	Dis. W4	Dis. W5	Dis. W6	Dis. W7
Female	0.14 (.09)[a]	−.11 (.08)	—	—	—	—	—	—	—
Black	0.11 (.08)	.03 (.07)	—	—	—	—	—	—	—
Age	−0.001 (.001)	.004*** (.001)	—	—	—	—	—	—	—
Heart trouble[c]	—	—	0.61* (.29)	1.86** (.64)	1.73** (.58)	0.16 (.56)	1.13* (.44)	0.89 (.55)	1.43* (.57)
Stroke[c]	—	—	2.99*** (.33)	5.31*** (.64)	4.73*** (.57)	4.19*** (.48)	3.74*** (.44)	2.35*** (.45)	2.80*** (.50)
High blood pressure[c]	—	—	0.42 (.23)	0.30 (.23)	0.28 (.19)	0.21 (.21)	0.27 (.26)	0.32 (.26)	0.43 (.23)
Diabetes[c]	—	—	0.25 (.26)	0.74 (.75)	1.87** (.69)	0.83* (.36)	0.16 (.61)	1.11 (.77)	0.98* (.48)
Hip fracture[c]	—	—	2.90*** (.44)	5.73*** (.96)	4.16*** (.87)	5.83*** (.83)	2.47*** (.74)	3.03*** (.74)	4.85*** (.78)
Broken bones[c]	—	—	0.47 (.25)	2.02*** (.57)	2.22*** (.52)	1.52*** (.47)	0.96 (.51)	0.96 (.51)	1.42** (.53)
Cancer[c]	—	—	−0.08 (.34)	1.46 (.80)	1.75** (.65)	1.66** (.62)	2.06*** (.55)	2.06*** (.55)	1.85** (.61)
Education	−0.01 (.02)	−.003 (.002)	—	—	—	—	—	—	—
Income	−0.03 (.02)	.01 (.02)	—	—	—	—	—	—	—
Rural	−0.18** (.07)	0.16* (.07)	—	—	—	—	—	—	—
Married	0.08 (.09)	−0.16 (.11)	—	—	—	—	—	—	—
Widowed	—	0.07[b] (.08)	—	—	—	—	—	—	—
Employed	−0.50*** (.12)	−0.10 (.11)	—	—	—	—	—	—	—
Owns home	−0.12* (.05)	−0.09 (.08)	—	—	—	—	—	—	—
Prof. career	−0.06 (.17)	−0.44** (.15)	—	—	—	—	—	—	—
Labor career	−0.35 (.16)	0.05 (.03)	—	—	—	—	—	—	—
Freq. attend religious services	−0.08*** (.02)	0.01 (.20)	—	—	—	—	—	—	—
Living children	−0.003 (.003)	0.004 (.01)	—	—	—	—	—	—	—
Close relatives	−0.01[b] (.01)		—	—	—	—	—	—	—
Lives alone	−0.21** (.08)	0.10 (.08)	—	—	—	—	—	—	—
Depression	0.01** (.003)	0.001 (.002)	—	—	—	—	—	—	—
Smoker			—	—	—	—	—	—	—
Current	0.03 (.12)	0.04 (.11)	—	—	—	—	—	—	—
Past	−0.08 (.10)	0.01 (.07)	—	—	—	—	—	—	—
Incontinent	0.15*** (.03)	−0.001 (.04)	—	—	—	—	—	—	—
Attrition λ	2.25 (1.33)	2.64* (1.29)	—	—	—	—	—	—	—

Note: Table is for the North Carolina Established Populations for the Epidemiologic Studies of the Elderly, 1986–1992.

[a]Slope coefficient (standard error).

[b]Instrumental variable.

[c]Wave specific.

*$p < .05$; **$p < .01$; ***$p < .001$.

group and not the other, the influence of having a labor career or high blood pressure on the level of disability did not significantly differ between Black and White older adults. Likewise, being employed and having cancer were not significantly different across groups in their prediction of the disability slope.

When the relationships that are significantly different across race groups are compared, marriage has a protective effect on the slope of disability for Black adults, but the effect is not apparent for White adults. Additionally, the protective effect of living in a rural area holds for Black older adults only; living in a rural area predicts lower overall levels of disability, but not for White adults. Having a professional career is actually associated with higher levels of disability for Black adults, but it also predicts lower overall trajectories of disability. Alternatively, having a labor career is associated with higher slopes of disability only for White older adults. Home ownership predicts lower levels of disability for White adults only.

Among health conditions, high blood pressure does not significantly affect the level or trajectory of disability for Black adults. It does, however, have a detrimental effect for White adults. Having diabetes likewise does not affect the overall level of disability for Black adults, but it is associated with lower levels of disability for White adults. Having broken bones at baseline predicts lower disability slopes for Black adults but has no significant effect for White adults. The negative relationship between broken bones and the slope of disability over time is probably indicative of the recovery process associated with healing.

Nonrandom attrition is consequential for both groups. The attrition lambda is positive and significant for the slope of disability among White older adults, indicating that those who were at highest risk of attrition had higher trajectories of disability. Black older adults have positive and significant lambdas for both the level and slope of disability. Thus, those Black subjects with the greatest likelihood of attrition had higher levels of disability and the most rapid increases in disability. This indicates that models that do not account for nonrandom selection underestimate the amount of disability—especially among Black older adults.

The final stage of the analysis tests whether incident morbidity, a direct measure of changing health status, accounted for all or some of the remaining racial disability gap. Table 4 presents those results.

At each wave, respondents were asked whether they had developed heart trouble, stroke, high blood pressure, diabetes, hip fractures, broken bones, or cancer since the last interview. Rather than being cumulative, these questions measure incident morbidity. As seen in Table 4, the incident health conditions at each wave were not used as independent predictors of the level

and slope of disability. This is because the level and slope are estimated by using the disability measures from all waves simultaneously, and using incident morbidity to estimate the level and slope would violate temporal ordering. Instead, disability at each wave was regressed on its wave-specific health conditions.

Incident heart trouble, stroke, hip fracture, and broken bones contributed to higher disability at the following wave. Newly diagnosed cancer also predicts higher disability at later waves. There were few changes in the other covariates compared to Model 2. However, the remaining significant difference in the disability level between Black and White older adults was explained with the incorporation of time-varying morbidities.

Discussion

This article began with three research questions: Does a racial disability gap exist? If yes, what happens to that gap over time? Does incident morbidity explain all or part of that gap? These analyses demonstrate that, indeed, a disability gap between Black and White adults exists and that the gap persists over time. Before SES, morbidity, and social support were controlled for, the gap continued to increase over time, which is consistent with the cumulative disadvantage theoretical framework (Dannefer, 1987). After social and health factors were controlled for, however, Black adults manifested a consistently higher level of disability, consistent with previous research on the double jeopardy hypothesis showing stability in race differences in health across the life course (Ferraro, 1987; Ferraro & Farmer, 1996). Despite the age-restricted sample of the EPESE, these results are parallel with these other studies, indicating persistent inequality in disability over time between Black and White older adults, neither diverging nor converging. These findings are not consistent, however, with a number of studies that have found a "disability crossover." Similar to the mortality crossover, some scholars report that the racial disability gap converges and that the oldest-old Black adults eventually have better physical functioning than their White counterparts (Clark et al., 1993; Guralnik, Land, et al., 1993).

To extend the examination of racial disability trajectories, we asked the following question: Is it possible that simply controlling for baseline health conditions did not account for the impact from incident morbidity on physical function over time? The final model in the analysis tested the effect of time-varying indicators of morbidity on disability. In this study, all of the health conditions (heart trouble, stroke, diabetes, broken bones, broken hip, and cancer) except high blood pressure were positively associated with disability at a minimum of one wave. It is not surprising that hypertension did not have an independent effect on disability. It is often a risk factor for other cardiovascular or cerebrovascular health conditions such as a heart attack or stroke (Manton & Stallard, 1997).

After covariates in Model 2 were controlled for, the difference in the slope of disability between Black and White adults became nonsignificant. It is known that older Black adults are significantly more likely to have a number of health conditions such as hypertension, diabetes, cardiovascular disease, stroke, and most types of cancer (Bradley, Given, & Roberts, 2001; Manton & Stallard, 1997; Miles & Bernard, 1992; Svetkey, George, Burchett, Morgan, & Blazer, 1993). Baseline health conditions accounted for some of the difference in overall level of disability by race, but the model incorporating incident morbidity rendered the racial differences in disability nonsignificant. Thus, capturing the "moving picture" of morbidity among older Black and White adults accounted for the remaining disability gap and provided a better understanding of the dynamics of health decline.

This article makes several contributions to the research on race differences in health. First, it examines the disability gap between Black and White older adults with seven repeated measures of both disability and morbidity over time. With the use of latent growth curve models, it was demonstrated that Black older adults experience steeper increases in disability over time compared with White older adults, which is similar to other research (Clark, 1997; Liao et al., 1999). However, once morbidity, socioeconomic resources, and social integration were controlled, Black adults continued to have a higher level of disability but no longer differed significantly from White adults in the rate of disablement over time. Thus, examining the groups separately demonstrates that even though a number of predictors of disability vary by race, the disability gap does not continue to increase over time. The gap is quite stable, indicating a persistent inequality among Black and White older adults. This finding is less common in the literature, but is consistent with some previous studies (Clark & Maddox, 1992; Ferraro & Farmer, 1996; Schoenbaum & Waidmann, 1997).

The second contribution is the adjustment for the effects of nonrandom attrition. In this sample of older adults, age and mortality selection do not temper the disability gap, as has been hypothesized in the past. In fact, older adults who were at the highest risk of attrition had significantly higher levels of disability and steeper disability slopes and the bias was greatest for Black older adults. A number of studies that have found a disability crossover between Black and White older adults did not account for selective survival (for an exception, see Mendes de Leon et al., 1997) and may be underestimating the existence—and persistence—of disability. After an adjustment for nonrandom attrition, these models provide no evidence that disability converges or crosses over for Black and White older adults. Indeed, results from the present study suggest that failure to consider attrition may give the *appearance* of a convergence in disabilities among Black and White adults.

Finally, time-varying indicators were incorporated into the estimates of the level and trajectory of disability over time. Rather than relying solely on information at baseline, the time-varying indicators allow the models to capture changes in predictors over the course of observation. Although some variables such as income may not change drastically over the course of study, changes in morbidity can be very consequential. A single health condition such as a stroke could cause a sharp spike in disability, but if it did not occur prior to baseline, then it may not be captured in the model. Other time-varying covariates may be consequential to physical functioning, such as changes in marital status, living arrangements, social support, and cognitive ability. These should be considered in future research.

There are two limitations of note in the present study. First, these results are from a single geographic region in North Carolina and cannot be generalized to other areas of the United States. Indeed, Mendes de Leon and colleagues (1997) found inconsistent results on the racial disability crossover in two

different areas of the nation; Black older adults had less disability after age 75 than their White counterparts in the New Haven EPESE, but no such crossover was found in the North Carolina EPESE. The absence of a disability crossover between Black and White older adults in North Carolina that has been found in other regions may be due to differences in geography, social structure, and history. Health trajectories, begun decades before, may manifest consistently higher disability among surviving Black adults in North Carolina compared with those in other areas of the nation.

Second, the measurement of several key concepts is limited. In these analyses, SES included income, education, home ownership, employment status, and primary occupation. However, for a complete understanding of the nature of economic disadvantage among older Black and White adults and its impact on subsequent health trajectories to be gained, a full spectrum of measures should be included such as sources of income, eligibility for social programs, and intergenerational transfers. Additionally, this research utilizes a single, one-dimensional measure of disability. Restrictions in self-care such as bathing, dressing, and using the bathroom independently do not represent the vast majority of community-dwelling elders. Hence, measurement of disability that focuses on these extreme limitations in physical function risks a "floor effect," whereby the majority of the sample has no or very few reportable difficulties. Further examination of the nature of the racial disability gap requires a multidimensional approach as called for in Verbrugge and Jette (1994), including the social, emotional, higher level physical functioning, cognitive, and sensory domains of disability.

Disability is one more health outcome for which a racial disparity exists. Even after nonrandom attrition is adjusted for, Black adults have significantly higher levels of disability. Controlling for SES, morbidity, and other covariates at baseline did not fully explain the racial disability gap between Black and White older adults. Only after the time-varying effect of incident morbidity was measured on the slope and trajectory of disability did the residual race differences disappear. This means that Black elders, despite their hardiness, are more likely than their White counterparts to experience compromised physical function as a result of new health conditions and diseases.

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References

Bengtson, V. L., Burgess, E. O., & Parrott, T. M. (1997). Theory, explanation, and a third generation of theoretical development in social gerontology. *Journal of Gerontology: Social Sciences, 52B*, S72–S88.

Berk, R. A. (1983). An introduction to sample selection bias in sociological data. *American Sociological Review, 48*, 386–398.

Bollen, K. A., & Curran, P. J. (2001). *Latent trajectory models: A structural equation perspective*. Unpublished manuscript, Chapel Hill, NC.

Bradley, C. J., Given, C. W., & Roberts, C. (2001). Disparities in cancer diagnosis and survival. *Cancer, 91*, 178–188.

Clark, D. O. (1996). The effect of walking on lower body disability among older Blacks and Whites. *American Journal of Public Health, 86*, 57–61.

Clark, D. O. (1997). U.S. trends in disability and institutionalization among older Blacks and Whites. *American Journal of Public Health, 87*, 438–442.

Clark, D. O., & Maddox, G. L. (1992). Racial and social correlates of age-related changes in functioning. *Journal of Gerontology: Social Sciences, 47*, S222–S232.

Clark, D. O., Maddox, G. L., & Steinhauser, K. (1993). Race, aging, and functional health. *Journal of Aging and Health, 5*, 536–553.

Cornoni-Huntley, J., Ostfeld, A. M., Taylor, J. O., Wallace, R. B., Blazer, D., Berkman, L. F., et al. (1993). Established Populations for Epidemiologic Studies of the Elderly: Study design and methodology. *Aging Clinical and Experimental Research, 5*, 27–37.

Dannefer, D. (1987). Aging as intracohort differentiation: Accentuation, the Matthew effect and the life course. *Sociological Forum, 2*, 211–237.

Dowd, J. J., & Bengtson, V. L. (1978). Aging in minority populations: An examination of the double jeopardy hypothesis. *Journal of Gerontology, 33*, 427–436.

Ferraro, K. F. (1987). Double jeopardy to health for Black older adults? *Journal of Gerontology, 42*, 528–533.

Ferraro, K. F., & Farmer, M. M. (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, K. F., Farmer, M. M., & Wybraniec, J. A. (1997). Health trajectories: Long-term dynamics among Black and White adults. *Journal of Health and Social Behavior, 38*, 38–54.

Gibson, R. C. (1991). Age-by-race differences in the health and functioning of elderly persons. *Journal of Aging and Health, 3*, 335–351.

Guralnik, J. M., LaCroix, A. Z., Abbott, R. D., Berkman, L. F., Satterfield, S., Evans, D. A., et al. (1993). Maintaining mobility in late life. I. Demographic characteristics and chronic conditions. *American Journal of Epidemiology, 137*, 845–857.

Guralnik, J. M., LaCroix, A. Z., Branch, L. G., Kasl, S. V., & Wallace, R. B. (1991). Morbidity and disability in older persons in the years prior to death. *American Journal of Public Health, 81*, 443–447.

Guralnik, J. M., Land, K. C., Blazer, D., Fillenbaum, G. G., & Branch, L. G. (1993). Educational status and active life expectancy among older Blacks and Whites. *New England Journal of Medicine, 329*, 110–116.

Heckman, J. J. (1979). Sample section bias as a specification error. *Econometrica, 47*, 153–161.

Hummer, R. A. (1996). Black–White differences in health and mortality: A review and conceptual model. *The Sociological Quarterly, 37*, 105–125.

Johnson, N. E. (2000). The racial crossover in comorbidity, disability, and mortality. *Demography, 37*, 267–283.

Katz, S., Ford, A. B., Moskowitz, R. W., Jackson, B. A., & Jaffee, M. W. (1963). Studies of illness in the aged: The Index of ADL, a standardized measure of biological and psychological function. *Journal of the American Medical Association, 185*, 914–919.

Kelloway, E. K. (1998). *Using LISREL for structural equation modeling*. Thousand Oaks, CA: Sage.

Liao, Y., McGee, D. L., Cao, G., & Cooper, R. S. (1999). Black–White differences in disability and morbidity in the last years of life. *American Journal of Epidemiology, 149*, 1097–1103.

Lillard, L. A., & Panis, C. W. A. (1998). Panel attrition from the PSID: Household income, marital status, and mortality. *Journal of Human Resources, 33*, 437–457.

Manton, K. G., & Stallard, E. (1997). Health and disability differences among racial and ethnic groups. In L. G. Martin & B. J. Soldo (Eds.), *Racial and ethnic differences in the health of older Americans* (pp. 43–105). Washington, DC: National Academy Press.

McArdle, J. J., & Hamagami, F. (1991). Modeling incomplete longitudinal and cross-sectional data using latent growth structural models. In L. M. Collins & J. L. Horn (Eds.), *Best methods for the analysis of change* (pp. 276–309). Washington, DC: American Psychological Association.

Mendes de Leon, C. F., Beckett, L. A., Fillenbaum, G. G., Brock, D. D.,

Branch, L. G., Evans, D. A., et al. (1997). Black–White differences in risk of becoming disabled and recovering from disability in old age: A longitudinal analysis of two EPESE populations. *American Journal of Epidemiology, 145*, 488–497.

Meredith, W., & Tisak, J. (1990). Latent curve analysis. *Psychometrika, 55*, 107–122.

Miles, T. P., & Bernard, M. A. (1992). Morbidity, disability, and health status of Black American elderly: A new look at the oldest old. *Journal of the American Geriatrics Society, 40*, 1047–1054.

Ostchega, Y., Harris, T. B., Hirsch, R., Parsons, V. L., & Kington, R. (2000). The prevalence of functional limitations and disability in older persons in the US: Data from the National Health and Nutrition Examination Survey III. *Journal of the American Geriatrics Society, 48*, 1132–1135.

Preston, S. H., Hill, M. E., & Drevenstedt, G. L. (1998). Childhood conditions that predict survival to advanced ages among African-Americans. *Social Science and Medicine, 47*, 1231–1246.

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385–401.

Sayer, A. G., & Cumsille, P. E. (2001). Second-order latent growth models. In L. M. Collins & A. G. Sayer (Eds.), *New methods for the analysis of change* (pp. 179–200). Washington, DC: American Psychological Association.

Schoenbaum, M., & Waidmann, T. (1997). Race, socioeconomic status, and health: Accounting for race differences in health. *Journal of Gerontology, 52B* (Special issue), 61–73.

Seeman, T., Charpentier, P. A., Berkman, L. F., Tinetti, M. E., Guralnik, J. M., Albert, M., et al. (1994). Predicting changes in physical performance in a high functioning elderly cohort: MacArthur Studies of Successful Aging. *Journal of Gerontology: Medical Sciences, 49*, M97–M108.

Svetkey, L. P., George, L. K., Burchett, B. M., Morgan, P. A., & Blazer, D. G. (1993). Black/White differences in hypertension in the elderly: An epidemiological analysis in central North Carolina. *American Journal of Epidemiology, 137*, 64–73.

Verbrugge, L. M., & Jette, A. M. (1994). The disablement process. *Social Science and Medicine, 38*, 1–14.

White-Means, S. I., & Hammond, J. M. (1993). Health insurance and disability levels for older Black and White women in the South. *Journal of Applied Gerontology, 12*, 482–496.

Willett, J. B., & Sayer, A. G. (1994). Using covariance structure analysis to detect correlates and predictors of individual change over time. *Psychological Bulletin, 116*, 363–381.

Williams, D., & Lawler, K. A. (2001). Stress and illness in low-income women: The roles of hardiness, John Henryism, and race. *Women and Health, 32*, 61–75.

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