Cumulative Disadvantage and Racial and Ethnic Disparities in Health at Midlife

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Abstract

Previous research has focused on accounting for various early life, life course, and concurrent health-relevant factors to explain group-level racial and ethnic disparities in health outcomes. However, it is often unclear how much of the disparity is due to differences in the *composition* of health-relevant factors across racial and ethnic groups and differences by race and ethnicity in the *association* between such factors and health outcomes. Using data from the over-40 health module of the NLSY 1979 cohort, this study uses regression decomposition techniques to delineate the contribution of each of these components to racial and ethnic disparities in summary measures of mental and physical health outcomes at midlife for women and men. There is evidence that three different cumulative disadvantage mechanisms work to produce particular racial and ethnic disparities in mental and physical health at midlife: through *status-resource interactions* in which there are varying health returns to health-relevant factors across racial and ethnic groups, compositional differences in persistent poverty status (*cumulative exposure*), and associational differences in household structure during adolescence (*path-dependent cumulative disadvantage*).

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Introduction

Research on group-level racial and ethnic disparities in health in the United States demonstrates that from childhood to old age, blacks are at an increased risk for morbidity, onset and progression of disease, mortality, lower life expectancy, and some (but not all) mental health outcomes relative to non-Hispanic whites (see, e.g., Keyes 2009; Lee and Turney 2012; Mezuk et al. 2010; Olshansky et al. 2012; Robert and House 2000; Schnittker and McLeod 2005; Williams and Collins 1995; Williams et al. 2007; Williams 2012). Hispanics or Latinos have similar or better health outcomes compared to non-Hispanic whites on some dimensions of health but worse outcomes on other dimensions such as rates of infectious diseases (Keppel, Pearcy, and Wagener 2002; Sorlie et al. 1993, Vega and Amaro 1994, Williams and Collins 1995).

While previous research has focused on accounting for various health-relevant factors to explain group-level racial and ethnic disparities in health outcomes, it is often unclear how much of the disparity is due to differences in the *composition* of health-relevant factors across racial and ethnic groups and differences by race and ethnicity in the *association* between such factors and health outcomes. This study examines group-level racial and ethnic disparities in summary measures of mental and physical health at midlife, using regression decomposition techniques to examine the contribution of each of these components to health disparities. The health-relevant factors examined are situated in the literatures of *cumulative disadvantage* and *cumulative inequality* to capture a range of life course advantages and disadvantages with implications for health. There is evidence that three different cumulative disadvantage mechanisms work to produce particular racial and ethnic disparities in mental and physical health at midlife: through *status-resource interactions* in which there are varying health returns to health-relevant factors

across racial and ethnic groups, compositional differences in persistent poverty status (*cumulative exposure*), and associational differences in household structure during adolescence (*path-dependent cumulative disadvantage*).

Review of the Literature

Socioeconomic status has implications for health because it shapes both the material conditions of life as well as exposure to attendant life stressors and positive life circumstances. The positive association between higher levels of individual socioeconomic status and better health at various stages of the life course is well-documented and one of the most robust findings in sociological, demographic, and medical research (Adler et al. 1994; House and Williams 2000; Kitagawa and Hauser 1973; Link and Phelan 1995). Socioeconomic status contributes to group-level racial and ethnic disparities in health because material conditions of life, life stressors, and positive life circumstances are unequally distributed across racial and ethnic groups. Previous research demonstrates that accounting for various facets of socioeconomic status and other health-relevant factors attenuates racial and ethnic disparities in health outcomes (see, for example, Braveman et al. 2010; Geronimus et al. 1996; Hayward, Crimmins, Miles, and Yang 2000; Kelley-Moore and Ferraro 2004; Kington and Smith 1997; Olshansky et al. 2012; Shuey and Willson 2008; Sorlie et al. 1992; Taylor 2008; Williams 1997; Williams and Collins 1995; Williams et al. 1997). However, race and ethnicity often have statistical effects on health above and beyond socioeconomic status, or what Williams (2012) calls "the added burden of race."

Health at any one point in time is the product of a series of decisions, contexts, and experiences across the life course. While accounting for concurrent socioeconomic and other health-relevant factors may be informative in explaining racial and ethnic disparities in mental

and physical health at a particular age, the composition of health-relevant factors from early life and across the life course are likely to contribute to health disparities. Conceptualizations of *cumulative disadvantage,* particularly those focused on accumulation in independent variables, may be used to examine racial and ethnic disparities in health. Cumulative disadvantage is broadly defined as a mechanism for inequality across some temporal process in which an unfavorable relative position engenders further relative losses (DiPrete and Eirich, 2006), an expansive definition allows for several operationalizations through which independent and dependent variables accumulate to lead to disparities in health outcomes at one point in time or growth in these disparities over time.[1]

Early life exposure to certain health-relevant advantages and disadvantages may lead to racial and ethnic disparities in health outcomes in adulthood through a *path-dependent cumulative disadvantage* mechanism (Hayward and Gorman 2004; Willson, Shuey and Elder 2007), in which early life conditions have direct effects on later health as well as indirect effects through intervening mechanisms. This also corresponds to the first and second axioms of *cumulative inequality* theory, which posits that early life conditions influence adult health outcomes both directly and through the adult socioeconomic and behavioral conditions they engender (Ferraro and Shippee 2009; Goosby 2013). In these frameworks, racial and ethnic disparities in health may be attributable to racial and ethnic differences in the composition of certain early life factors. Previous research finds evidence that early life socioeconomic factors

[1] The cumulative disadvantage perspective has been used to examine the mechanisms through which racial and ethnic disparities in health grow over time, speaking to accumulation in the dependent variable. These studies examine whether the gaps across health trajectories by race and ethnicity persist or grow over time (see, e.g., Haas and Rohlfsen 2010; Kelley-Moore and Ferraro 2004; Shuey and Willson 2008; Spence, Adkins, and Dupre 2011; Taylor 2008; Walsemann, Gee, and Geronimus 2009; Walsemann, Geronimus, and Gee 2008).

account in part for racial and ethnic disparities in depressive symptoms and mortality (Walsemann et al. 2009; Warner and Hayward 2006).

The repeated or *cumulative exposure* to certain socioeconomic advantages and disadvantages across the life course may be an important predictor of health above and beyond socioeconomic factors at any one point in the life course (Blau and Duncan 1967; DiPrete and Eirich 2006; O'Rand 1996; Willson, Shuey, and Elder 2007). To the extent that the persistent exposure to certain health-relevant factors is unequally distributed across racial and ethnic groups, cumulative exposure would contribute to racial and ethnic disparities in health. However, this facet of cumulative disadvantage has remained relatively unexplored with respect to racial and ethnic health disparities.

Thus, the composition of early life, life course, and concurrent health-relevant factors may contribute to group-level racial and ethnic disparities in physical and mental health at a given age. In addition, the association between a given health-relevant factor and health may vary across racial and ethnic groups. In the cumulative disadvantage framework, Blau and Duncan's (1967) *status-resource interaction* model incorporates direct effects of a status variable (e.g., race) on an outcome of interest (e.g., health) as well as an interaction between the status and resources of interest (e.g., socioeconomic factors) that generates heterogeneity across groups. Following this framework, the association between health-relevant factors and health may depend on race and ethnicity. A few studies have shown no significant interactions between race and early life or concurrent socioeconomic status in their effects on health at one point in time or trajectories of health (Haas and Rohlfsen 2010; Hayward et al. 2000; Seeman et al. 2008), while at least one finds support that the effects of socioeconomic status, in particular education, on health differ across racial and ethnic groups (Shuey and Willson 2008). While

empirical support is mixed, scholars often invoke varying health-returns across racial and ethnic groups as integral to the production of health disparities (see, e.g., Colen [2011]; Williams [2012]).

Using regression decomposition techniques, this study examines group-level racial and ethnic disparities in mental and physical health at midlife, delineating how much of the disparity in a particular health outcome is due to differences in the *composition* of health relevant factors across racial and ethnic groups and differences by race and ethnicity in the *association* between such factors and health outcomes. This study incorporates a range of early life, life course, and concurrent socioeconomic and other health-relevant factors chosen because they are associated with health and are unequally distributed across racial and ethnic groups, have varying associations with health across race and ethnicity, or both in prior research. It is expected that three different cumulative disadvantage mechanisms will work to produce racial and ethnic disparities in mental and physical health at midlife: through compositional differences in early life (*path-dependent*) and life course (*cumulative exposure*) health-relevant factors across racial and ethnic groups, as well as *status-resource interactions* in which there are varying health returns to health-relevant factors across racial and ethnic groups.

Methods

Data

Data come from the National Longitudinal Study of Youth 1979 (NLSY), a nationally representative sample (and oversample of blacks and Hispanics) of 12,686 men and women who were between the ages of 14 and 22 when first surveyed in 1979 (http://www.bls.gov/nls/nlsy79.htm). Data were collected yearly from 1979 to 1994, and biennially from 1996 to the present, initially to chronicle the labor force experience of this

cohort. However, other sets of questions have been added over the years and broadened the scope of the survey. Sample members were interviewed about their health during the wave of the survey following their fortieth birthday (1998, 2000, 2002, 2004, or 2006). This over-40 health module contains information about multiple domains of physical and mental health for persons between the ages of 40 and 42 (depending on when they were interviewed after their fortieth birthday). The analytic sample is restricted to those who participated in the over-40 health module. Racial and ethnic disparities in mental and physical health are examined within gender and across three racial and ethnic groups: non-black non-Hispanics (the majority of whom are white and will henceforth be called white), black non-Hispanics, and Hispanics or Latinos.

Measures

Dependent variables. The *depressive symptoms* index is constructed as the sum of seven items from the Center for Epidemiologic Studies Depression scale (Radloff 1977) about how often the respondent felt each depressive symptom, with answers ranging from not at all (1) to most days (4). Scores ranged from 7 to 28 with a higher score indicating more depressive symptoms. The natural log of the index was used for analysis because the raw score was positively skewed. The *poor physical health* index is derived from the physical component summary of the 12-item Short Form (SF-12), a brief inventory of twelve physical and mental health questions that captures functional health and well-being from the respondent's point of view (Ware, Kosinski, and Keller 1996). The inventory includes questions on self-reported health, limitations and pain hindering various activities, and how often the respondent experiences various emotional states. The physical component summary score was constructed by the NLSY from the twelve items using the physical health regression weights available in

Ware, Kosinski, and Keller (1995). Scores were calibrated so that they range from 0 to 100 in the population, respondents with a score above 50 have better health than the typical person in the general U.S. population (age is not held constant) and each one-point difference above or below 50 corresponds to one-tenth of a standard deviation; the NLSY sample has a slightly higher mean score and slightly lower standard deviation compared to general U.S. population. The distribution of the variable was reversed to make it positively skewed by subtracting each SF-12 physical component score from one plus the maximum SF-12 physical component score in the sample; thus, higher scores indicate worse physical health in this analysis. The natural log of this reversed score was used to correct for non-normality.

Independent variables. The health-relevant independent variables used in this analysis were measured in the same wave as when the respondent participated in the over-40 health module except where otherwise noted. *Educational attainment* is categorized as less than high school, high school, three years of college or less, and four or more years of college. *Family poverty status* is defined as the total family income being below the poverty level for the last year, as issued by the U.S. Department of Health and Human Services and based on Census Bureau poverty guidelines for that year. Two measures of employment status used in this analysis are *any time out of the labor force*, defined as any time spent unemployed and unavailable for work at least one week in the last year, and *any time unemployed*, defined as any time spent unemployed and available for work at last one week in the last year. "Unavailable" means that the person was not looking for work, for example because they were engaged in housework, in school, unable to work because of long-term physical or mental illness, retired, or voluntarily idle. *Household net worth* is a categorical variable of net worth divided into six categories: negative or zero, $1-9,999, $10,000-49,999, $50,000-149,999, $150,000-299,999,

and $300,000 or more. Respondent *body mass index* (BMI) is a categorical variable using the cut points denoted by the Centers for Disease Control (BMI under 25 is normal weight [very few sample members were underweight], 25-29 is overweight, 30-34 is obese I, and 35 and over is obese II). *Health plan coverage* captures whether the respondent has any health or hospital plan coverage for their health care. *Smoker*, measured in 1998, captures whether the respondent was a daily smoker at that time. An index of *perceived neighborhood problems*, measured in 1998 for women only, is created from a series of questions about neighborhood safety, friendliness, and quality of life. *Marital status* is captures whether the respondent is currently married or not. *Children ever born* captures the number of children the respondent had up until the over-40 health module. *Year* participated in the over-40 health module is included to address potential period and cohort differences given the 8-year age range of sample members and, as a result, the 8-year time period in which the over-40 data were obtained.

Other health-relevant independent variables were measured earlier in life, including whether the respondent was *born in the United States*, whether the respondent was *living with both biological parents at age 14*, whether the respondent reported having a *health limitation* during the first wave of the NLSY (1979). *Persistent poverty status* is constructed from the proportion of waves the respondent reported being in poverty over the course of the study period (from 1979 until the wave before their participation in the over-40 health module), and divided into three categories: the respondent never reported being in poverty over the study period, the respondent reported being in poverty in less than half of the surveys over the study period, and the respondent reported being in poverty in half or more of the waves of the study over that period.

Analytic strategy

The decomposition of differences in mean mental and physical health across racial and ethnic groups delineates the contribution of the *composition* of a broad range of health-relevant factors and the contribution of the *association* between these factors and health in explaining overall racial and ethnic disparities in health outcomes at midlife. This study uses the Oaxaca-Blinder technique, which takes advantage of the additive separability of ordinary least squares (OLS) regression to decompose the difference in average outcomes between two groups (Blinder 1973; Oaxaca 1973; Jann 2008; Winsborough and Dickinson 1971).

For example, OLS regression models predicting depressive symptoms for each group (e.g., white and black women) are estimated, where X is a vector of independent variables and the constant:

$$Y_w = X_w'\beta_w + \varepsilon_w$$

$$Y_b = X_b'\beta_b + \varepsilon_b$$

The difference in mean depressive symptoms across the two models is:

$$D = \bar{Y}_w - \bar{Y}_b = \bar{X}_w'\hat{\beta}_w - \bar{X}_b'\hat{\beta}_b$$

which if the terms are expanded and rearranged becomes:

$$D = (\bar{X}_w - \bar{X}_b)'\hat{\beta}_b + \bar{X}_b'(\hat{\beta}_w - \hat{\beta}_b) + (\bar{X}_w - \bar{X}_b)'(\hat{\beta}_w - \hat{\beta}_b)$$

This equation expresses the expected effect on depressive symptoms for black women if they had the same level of health-relevant factors or associations between health-relevant factors and depressive symptoms as white women. The first component represents how much of the difference between white and black women's depressive symptoms is due to group differences in the composition of health-relevant factors. The second component represents how much of the difference between white and black women's depressive symptoms is due to group differences in

the associations between health-relevant factors and depressive symptoms. The third component represents the interaction between the composition and association terms, accounting for the fact that differences and in composition and association exist simultaneously between the two groups being compared. This term is difficult to interpret but is retained in the analysis to provide more conservative estimates of the contribution of the compositional and association components (see, e.g., Karraker, DeLamater, and Schwartz [2011]).

Parameter estimates and standard errors for each term are estimated using the *oaxaca* command in Stata 12.1 following the procedure outlined by Jann (2008). Decomposition using categorical independent variables is conducted using transformations of deviations from the grand mean so that the results are the same irrespective of the base category chosen (Jann 2008; Suits 1984; Yun 2005). Cases are dropped due to item-missing data; *oaxaca* is not supported in the *mi* set of commands for multiply imputed data in Stata. Doing so appears to underestimate inequalities, in that those who are retained in the analytic sample are slightly healthier and wealthier than those who are excluded due to item-missing data.

Results

Table 1 gives the weighted descriptive statistics and shows the compositional differences across racial and ethnic groups. In instances where the effects of health-relevant factors on health vary across racial and ethnic groups, additional regression analyses (not shown) coupled with seemingly unrelated estimation (Weesie 1999) are discussed to provide context for how the relationships vary by race and ethnicity. The linear decompositions of mean differences in mental and physical health are done within gender and across the three racial and ethnic groups. Table 2 shows the results of the decomposition of mean differences in (logged) depressive symptoms across racial and ethnic groups for women. Each analysis shows the effects of the

composition of health-relevant factors, the association of health-relevant factors with depressive symptoms, and the interaction between the composition and association, both in total as well as by specific health-relevant factors. The coefficients are in the unit of the logged depressive symptoms, thus dividing the coefficient by the mean difference gives the proportion of the difference that is attributable to each health-relevant factor within component (composition, association, or interaction). The decomposition is always expressed from the perspective of Group 2; e.g., the expected effect on depressive symptoms for Group 2 if Group 2 had the same composition (or association or interaction) as Group 1. Table 3 shows the same analysis for men. Tables 4 and 5 show the same set of analyses using poor physical health as the outcome of interest.

Table 2 shows that while there was not a significant disparity in depressive symptoms between Hispanic and white women, depressive symptoms would decrease for Hispanic women if they had the same lower levels of current poverty status as white women.[2] There was a significant disparity in depressive symptoms among white and black women.[3] The detailed decomposition shows that the disparity in depressive symptoms between black and white women would decrease if black women had the same higher levels of net worth and lower levels of perceived neighborhood problems as white women. Furthermore, there were differences in the association between household structure at age 14 and depressive symptoms across white and black women, such that the disparity in white and black women's depressive symptoms would be reduced if living in a two-parent household at age 14 had the same association with depressive

[2] Table 1 shows the compositional differences to be able to say, e.g., lower levels of current and persistent poverty status.

[3] This difference corresponds to an over 7% difference on the depressive symptoms scale. Because the depressive symptoms and poor physical health measures are log transformed, the coefficients can be interpreted in terms of percent change when exponentiated, such that the difference in mean depressive symptoms across groups can be expressed as 100*[exp(β)-1] percent (Wooldridge 2009). Exponentiating the decomposition model re-transforms the outcome back to its original scale; on a scale of depressive symptoms from 7-28, the mean for white women was 9.81 and the mean for black women was 10.58.

symptoms for black women as for white women.[4] However, the disparity in white and black women's depressive symptoms would increase if smoking and health plan coverage had the same association with depressive symptoms for black women as for white women.[5] The significant disparity between Hispanic and black women's depressive symptoms (an over 7% difference) was attributable to differences in the composition of net worth and perceived neighborhood problems, as well as differences in the association of depressive symptoms with persistent poverty status and household structure at age 14.[6]

While there was not a significant disparity in depressive symptoms between Hispanic and white men, the decomposition shows that depressive symptoms would decrease for Hispanic men as a group if they had the same lower levels of current poverty as non-Hispanic white men (Table 3). There was a significant disparity in depressive symptoms among white and black men (an over 5% difference on the depressive symptoms scale), and no significant disparity between black and Hispanic men's depressive symptoms. In each of these comparisons, the detailed decomposition shows that black men's group-level depressive symptoms would decrease if they had the same lower levels of current time out of the labor force as white and Hispanic men.

[4] Regression analysis shows a negative association between depressive symptoms and living in a two parent household at age 14 for white women, and a positive association between these two variables for black women, although neither association is significantly different from zero. Seemingly unrelated estimation shows that the negative association between living in a two-parent household at age 14 and depressive symptoms for white women is significantly different from the positive association between living in a two-parent household and depressive symptoms for black women.

[5] Regression analysis shows a positive and nonsignificant association between smoking and depressive symptoms for both white and black women, a positive and nonsignficant association between health plan coverage and depressive symptoms for white women, and a negative and nonsignificant association between health plan coverage and depressive symptoms for black women. In both cases, seemingly unrelated estimation shows that the association with depressive symptoms is not significantly stronger for one group over the other.

[6] Seemingly unrelated estimation shows that the negative association between living in a two-parent household at age 14 and depressive symptoms for Hispanic women is not significantly different from the positive association between living in a two-parent household and depressive symptoms for black women. Seemingly unrelated estimation shows that the positive association between depressive symptoms and having lived in poverty in up to half of survey waves (compared to never living in poverty) is significantly stronger for Hispanic compared to black women.

Table 4 shows the decomposition analysis of the differences by race and ethnicity in women's mean poor physical health. There was no difference in white and Hispanic women's poor physical health at midlife as measured by the logged SF12 physical components scale, while black women had significantly worse poor physical health compared to both white and Hispanic women, corresponding to an 8% difference on the scale of poor physical health. Racial and ethnic disparities in women's poor physical health would be reduced if the compositional differences in BMI, perceived neighborhood problems, and current and persistent poverty status—in which blacks have the highest levels, whites have the lowest, and Hispanics are in the middle—were diminished. However, racial and ethnic disparities in women's poor physical health would increase if Hispanic and black women had the same lower levels of children ever born as white women, and if black women had the same higher levels of health plan coverage as white women. Furthermore, the black-white disparity in women's poor physical health would be reduced if the association between household structure at age 14 and physical health were the same for black women as for white women.[7] The disparity in poor physical health between Hispanic and black women would decrease if the association between time out of the labor force and poor physical health were the same for black women as for Hispanic women.[8]

There was a significant disparity in white and Hispanic men's poor physical health at midlife, corresponding to an over 5% difference between the two groups on the measure of poor physical health (Table 5). The disparity in poor physical health between Hispanic and white men would decrease if Hispanic men had the same higher levels of educational attainment and lower

[7] Regression analyses show the association between living in a two-parent household and poor physical health is negative and significant for white women, while positive and nonsignificant for black women. Seemingly unrelated estimation shows that the association of living in a two-parent household at age 14 with poor physical health is significantly stronger for white compared to black women.

[8] Seemingly unrelated estimation shows that the positive association between time out of the labor force and poor physical health is significantly stronger for black compared to Hispanic women.

levels of BMI and any current time spent out of the labor force as that of white men, yet the disparity would increase if Hispanic men had the same higher levels of health plan coverage and lower levels of children ever born and current unemployment as that of white men. Furthermore, the disparity would increase if spending any time unemployed had the same association with poor physical health for Hispanic and white men, while the disparity would decrease if spending any time out of the labor force had the same association with poor physical health for Hispanic and white men.[9] There was a significant disparity in white and black men's physical health, an almost 5% difference, which would decrease if black men had the same lower levels of BMI, current poverty status, and any time out of the labor force as that of white men, and would increase if black men had the same higher levels of coverage by a health plan as that of white men. Furthermore, the disparity in poor physical health among black and white men would decrease if the association of poor physical health with health plan coverage and current time out of the labor force were the same for black men as for white men, while the disparity would increase if the association between smoking and poor physical health were the same for black men as for white men.[10] While there was no significant disparity in poor physical health between Hispanic and black men, the decomposition shows that black men's poor physical health would decrease if they had the same lower levels of current poverty status and time spent

[9] Seemingly unrelated estimation shows a negative association between being unemployed and poor physical health is significantly stronger for Hispanic compared to white men (for whom the effect is positive and nonsignificant). While spending any time out the labor force is positively associated with poor physical health for both white and Hispanic men, the effect is significantly stronger for Hispanic compared to white men.

[10] Seemingly unrelated estimation shows that the positive association of poor physical health with time out of the labor force and health plan coverage is significantly stronger for black men compared to white men. The positive association between smoking and poor physical health is significantly stronger for white men compared to black men.

out of the labor force as Hispanic men, and if children ever born had the same association with poor physical health as for Hispanic men.[11]

Other stressful life events, with implications for racial and ethnic groups differences in socioeconomic status and health both during and across the life course, were examined but not included in the final analysis. Results were remarkably similar when persistent unemployment was included in the model, and persistent unemployment did not significantly contribute to the disparities in mental and physical health. Thus, while persistent unemployment is associated with psychological distress (see Daly and Delaney [2013) which may contribute to increased depressive symptoms and poor mental health, and persistent unemployment varies across racial and ethnic groups, persistent unemployment did not contribute to racial and ethnic the disparities observed either in terms of composition or association above and beyond the other factors in the analysis. Ever being incarcerated and bankruptcy did not explain the disparities in mental and physical health at midlife; however, there may not be enough statistical power to detect these effects. Furthermore, bankruptcy may be heterogeneous in its effects on health.

Discussion

This study examines racial and ethnic disparities in mental and physical health at midlife, delineating how much of the disparity is due to differences in the *composition* of health-relevant factors across racial and ethnic groups and differences by race and ethnicity in the *association* between such factors and health outcomes. This study highlights various facets of concurrent socioeconomic status (net worth, poverty status, time out of the labor force, time unemployed, health plan coverage, perceived neighborhood problems) and health-relevant factors (BMI, smoking, health plan coverage) that lead to racial and ethnic disparities in mental and physical

[11] Seemingly unrelated estimation shows that the negative association between children ever born and poor physical health is significantly stronger for Hispanic men compared to black men (for whom the effect is positive and nonsignificant).

health at midlife, both through differing composition across racial and ethnic groups as well as differing associations with mental and physical health by race and ethnicity, the latter consistent with the concept of *status-resource interaction*.

While concurrent health-relevant factors contributed to racial and ethnic disparities in men's mental and physical health, life course mechanisms of cumulative disadvantage work to produce racial and ethnic disparities in women's mental and physical health at midlife. Consistent with the *cumulative exposure* mechanism for inequality, the differing composition across groups in persistent poverty status across the life course played a role in explaining racial and ethnic disparities in women's physical health. Of course, it is unclear the mechanism through which persistent poverty status leads to racial and ethnic disparities in women's physical health: as a proxy for stressful life conditions, through material deprivation, or due to early life and life course health above and beyond the broad measure of health in 1979 included here. One particular early life health-relevant exposure--family structure in adolescence--also contributed to racial and ethnic disparities in women's mental and physical health through its varying health returns across racial and ethnic groups, an amalgam of both *path-dependent* and *status-resource interaction* cumulative disadvantage mechanisms. The physical health returns to adolescent household structure are stronger for white compared to black women, which may be due to differences in the presence and scope of involvement of extended kin networks that buffer the economic and psychosocial burdens associated with other household structures (see, e.g., Taylor, Seaton, and Dominguez 2008).

Taken together, the results highlight the need to tackle inequalities across the life course in the socioeconomic and other health-relevant factors that shape racial and ethnic health disparities. Even though the health disparities at midlife are small, understanding the

mechanisms that are producing small health gaps at midlife is important for determining how to mitigate gaps that are expected to persist and grow larger with time (see, e.g., Haas and Rohlfsen 2010; Kelley-Moore and Ferraro 2004; Shuey and Willson 2008; Taylor 2008). Furthermore, the small gaps in these summary measures of mental and physical health may not capture the larger gaps that emerge in biologic processes such as inflammation (see, e.g., Das [2013]).

Policy is often proposed and enacted at the population level, with a focus on reducing disparities between groups. Distinguishing between the composition and association components and their relative strengths has important implications for policy concerned with reducing health disparities. Mitigating the actual compositional differences across health-relevant factors or mitigating the impact of the compositional differences (Phelan, Link, and Tehranifar 2010) would serve to decrease several of the racial and ethnic disparities in mental and physical health examined here. For example, that perceived neighborhood problems contribute to racial and ethnic disparities in women's mental and physical health highlights potential contribution of residential segregation to racial and ethnic health disparities, in that blacks in particular are more likely to be concentrated in socially, economically, and environmentally disadvantaged contexts (Colen 2011; Williams 2012). Policies to ameliorate the legacy of racial and socioeconomic segregation or compensate for the effects of such segregation might reduce the gaps in health that are emerging at midlife.

However, it is less clear how to mitigate the associational differences, particularly because the mechanisms that generate varying health returns to health-relevant factors by race and ethnicity have not been systematically explored. This study demonstrates that the health returns to some health-relevant factors vary by race and ethnicity, consistent with a *status-resource interaction* as a mechanism for inequality (Blau and Duncan 1967; DiPrete and Eirich

2006). The varying returns to smoking in this analysis conflict with studies that show a given level of tobacco use has more adverse impacts on blacks compared to whites (see Williams [2012] for a review), although this analysis incorporates only a rough categorization of smoking (daily smoker in 1998 compared to not).

Furthermore, the mechanisms that lead to varying health returns to current poverty status, time unemployed, and time spent out of the labor force have not been articulated. In particular, linking micro- and meso-level analyses with large scale data collection efforts would be a good place to contend with the mechanisms through which the health returns to health-relevant factors vary by race and ethnicity. Health-relevant factors may translate to different health effects across racial and ethnic groups in part through micro- and meso-level processes that vary by race or ethnicity. Previous research has shown varying health returns to perceived discrimination across race, ethnicity, and socioeconomic status (see, e.g., Bratter and Gorman 2011; Colen 2011; Fuller-Rowell, Doan, and Eccles 2012; Grollman 2012; Krieger 1990; Krieger and Sidney 1996; Major, Quinton, and McCoy 2002; Williams and Mohammed 2009). However, there are several other candidate psychosocial and interpersonal processes that may contribute to varying health returns to health-relevant factors by race and ethnicity, such as subjective status comparisons to others, kin network demands, concepts of self or identity, meaning construction and negotiation, social interactions, patient-provider interactions, and interviewer-respondent interactions during the survey interview (Colen 2011; Garbarski, Schaeffer, and Dykema 2011; Heflin and Chiteji 2012; Schnittker and McLeod 2005; Williams 2012). Future research should explicate the mechanisms through which varying health returns to concurrent socioeconomic factors are produced, with particular attention to these and other micro- and meso-level processes.

Certain health-relevant factors did not play a role in the racial and ethnic disparities in mental and physical health at midlife. For example, given the association between being married and good health, the differing composition in marital status across racial and ethnic groups might contribute to racial and ethnic disparities in health. However, there is not a significant contribution of marriage net of the health-relevant factors in the analysis. There is also no evidence that the healthy immigrant effect contributes to group-level disparities (see Williams and Sternthal [2010] for a review), although there is likely not enough statistical power with which to find the effect. Limitations in work due to health earlier in life (in 1979) did not appear to contribute to racial and ethnic disparities in physical and mental health at midlife. Thus, this broad measure of early life health does not appear to capture the racial and ethnic disparities in health that begin to emerge in early life, particularly those associated with exposure to toxins, diseases, malnutrition, and poor maternal health in utero and in childhood, family socioeconomic background, access to health care, and health service utilization (see, e.g., Barker 1998; Conley and Bennett 2000; Elo and Preston 1992; Flores, Olson, and Tomany-Korman, 2005; Haas 2006; Hayward and Gorman 2004; Heckman 2007; Marmot et al. 1984; Palloni 2006; Preston, Hill, and Drevenstedt 1998).

Other health-relevant factors played unexpected roles in explaining racial and ethnic disparities in health. That health plan coverage would increase the disparities in poor physical health may say something about differences in when coverage is sought: because of the concentration of socioeconomic disadvantages for racial and ethnic minorities, whites may be more likely to be covered by a medical plan regardless of whether their health necessitates it, while coverage may be sought by blacks and Hispanics precisely because of their health. Similarly, children ever born may be a proxy for other unmeasured facets of health and

socioeconomic status across the life course; given that racial and ethnic minorities on average have more children than do whites, those racial and ethnic minorities who have fewer children may be in worse health.

The overall gaps in mental and physical health are nonexistent between white and Hispanic women, yet the decomposition shows the potential for differing pathways through which these similar levels of health are achieved. However, this study does not completely elucidate the countervailing forces through which the Hispanic or Latina health paradox emerges, as only a few of the specific health-relevant factors have independent effects net of other health-relevant factors.

One limitation of the current study is that the direction of the observed relationships cannot be parsed. For example, time out of the labor force, which plays an important role in the racial and ethnic disparities in men's mental and physical health, could occur because of one's health. Overall, this analysis can document the health disparities that are emerging at midlife and their attendant socioeconomic and other health-relevant circumstances, but cannot precisely tease out which came first outside of having included the broad measure of limitations in work due to health in 1979 as a proxy for early life health status. It is plausible that including measures of persistent health limitations or obesity (see, e.g., Ferraro and Kelley-Moore 2003) may aid in temporal interpretations by accounting for additional life course health measures.

Continued survey participation is intimately related to the variables of interest in this study. Data loss in longitudinal panels due to death and attrition winnows the sample so that those who remain are increasingly the healthiest and wealthiest people, leading to underestimated inequalities in health and socioeconomic status over time. The next stage of this analysis will examine whether the results reported here are robust to an adjustment made for

selection bias for inclusion in the analytic sample (i.e., remaining in the study until the over-40 health module). Similarly, adjustments for those included in the analytic sample but are deleted due to item-missing data will be explored.

Other next steps for this study include examining disparities in other health outcomes from the over-40 health module and examining disparities across gender within racial and ethnic groups. The proportion of the variation explained in regressions of mental and physical health on these health-relevant factors is small, on the order of .20. Other health-relevant measures will be included in the next phase of the analysis, such as other early life socioeconomic factors; more proximal measures of health behaviors like exercise and alcohol consumption; familial and spousal characteristics; and job characteristics. However, the higher proportion of missing data on some of these variables and subgroup analyses with those who are married or employed may become prohibitively small for the decomposition analysis. Finally, the NLSY79 has two waves of the over-50 health module available. The analysis here will be replicated to examine racial and ethnic disparities in health declines over the ten year period, linking accumulation in both independent and dependent variables by accounting for the path-dependent, cumulative exposure, and status-resource interaction mechanisms that are associated with health declines.

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Table 1. Weighted Descriptive Statistics of Analytic Sample at Midlife by Race, Ethnicity, and Gender, NLSY 1979 Cohort

	White Women				Hispanic Women				Black Women		
	Mean or Proportion	SD		N	Mean or Proportion	SD		N	Mean or Proportion	SD	N
CESD, logged (1.95-3.33)	2.29	0.34	d	2129	2.31	0.37	f	824	2.35	0.37	1302
CESD (7-28)	10.53	4.18	d	2129	10.83	4.67	f	824	11.33	4.78	1302
SF12, logged (0-4.06)	2.76	0.39	a,d	2134	2.81	0.37	f	826	2.85	0.39	1311
SF12 (1-58.15)	17.18	8.43	c,d	2134	17.94	8.31	f	826	18.81	8.94	1311
Education											
Less than high school	0.05		a,d	2143	0.17		d	835	0.11		1318
High school	0.41				0.40				0.40		
Some college	0.24		b,d		0.29				0.33		
4 years or more of college	0.29		a,d		0.14				0.16		
BMI											
Normal weight	0.52		a,d	2004	0.33		e	762	0.27		1206
Overweight	0.26		a,f		0.33				0.30		
Obese I	0.14		a,d		0.21				0.22		
Obese II	0.09		b,d		0.13		d		0.21		
Married (1= yes)	0.71		a,d	2143	0.59		d	835	0.37		1317
Smoker[g] (1= yes)	0.26		a	2157	0.16		d	821	0.26		1294
Children ever born (0-10)	1.85	1.27	a,d	2143	2.37	1.54	e	835	2.15	1.51	1318
Health plan coverage (1= yes)	0.88		a,d	2141	0.80			832	0.79		1315

Net worth											
Negative or zero	0.08		a,d	1942	0.19		d	748	0.27		1197
$1-9,999	0.08		a,d		0.15		d		0.22		
$10,000-49,999	0.14		a,d		0.21				0.22		
$50,000-149,999	0.27		a,d		0.21		f		0.17		
$150,000-299,999	0.19		a,d		0.12		e		0.07		
$300,000 or more	0.24		a,d		0.12		d		0.03		
Poverty status (1= yes)	0.09		a,d	1847	0.21		d	704	0.28		1049
Any time unemployed (1= yes)	0.08		d	2110	0.10			807	0.12		1286
Any time out of labor force (1= yes)	0.30			2110	0.34			807	0.30		1286
Health limitation in 1979 (1=yes)	0.06		a	3638	0.04			979	0.05		1516
Born outside the US (1=yes)	0.03		a	3720	0.25		d	1002	0.03		1561
Lived with both biological parents at age 14 (1=yes)	0.79		a,d	3719	0.66		d	999	0.50		1556
Persistent poverty status				2136							1314
Never	0.56		a,d		0.37		d	833	0.22		
Less than half of study	0.37		e		0.38				0.42		
Half of study or more	0.06		a,d		0.25		d		0.36		
Year over 40											
1998	0.19			2143	0.18			835	0.18		1318
2000	0.26				0.25				0.26		
2002	0.25				0.22				0.23		
2004	0.24				0.26				0.26		
2006	0.07				0.08				0.07		
Neighborhood problems index (0-16)[g]	2.33	2.73	a,d	2058	3.75	3.67	d	764	4.46	4.05	1238

	White Men				Hispanic Men				Black Men		
	Mean or Proportion	SD		N	Mean or Proportion	SD		N	Mean or Proportion	SD	N
Logged CESD (1.95-3.33)	2.20	0.30	c,d	2044	2.23	0.33	f	812	2.27	0.34	1253
CESD (7-28)	9.48	3.46	c,d		9.90	3.94	f		10.31	4.19	
Logged SF12 (0-4.06)	2.72	0.31	a,d	2050	2.78	0.36		814	2.77	0.34	1267
SF12 (1-58.15)	16.09	6.50	a,d		17.41	7.98			17.05	7.47	
Education											
Less than high school	0.08		a,d	2065	0.21		d	824	0.13		1280
High school	0.42		d		0.43		d		0.53		
Some college	0.21				0.22				0.20		
4 years or more of college	0.29		a,d		0.13				0.13		
BMI											
Normal weight	0.26		a,f	1990	0.19			777	0.23		1222
Overweight	0.47				0.46				0.46		
Obese I	0.20				0.23				0.22		
Obese II	0.07		a,e		0.12				0.10		
Married (1= yes)	0.69		a,d	2063	0.57		d	824	0.41		1280
Smoker[g] (1= yes)	0.27		a	2058	0.21		d	784	0.30		1219
Children ever born (0-10)	1.61	1.27	a,d	2065	2.04	1.59		824	1.92	1.59	1280
Health plan coverage (1= yes)	0.85		a,d	2063	0.72			822	0.70		1276
Net worth											
Negative or zero	0.08		a,d	1929	0.18		d	720	0.27		1115
$1-9,999	0.08		a,d		0.17				0.20		
$10,000-49,999	0.15		a,d		0.21				0.21		
$50,000-149,999	0.25		c,d		0.20				0.19		
$150,000-299,999	0.20		a,d		0.12		e		0.07		
$300,000 or more	0.24		a,d		0.12		d		0.05		

Poverty status (1= yes)	0.06	a,d	1848	0.16	d	687	0.25	1007
Any time unemployed (1= yes)	0.07	b,d	2008	0.11	f	796	0.15	1238
Any time out of labor force (1= yes)	0.12	a,d	2008	0.18	e	796	0.24	1238
Health limitation in 1979 (1=yes)	0.04		3746	0.04		990	0.04	1596
Born outside the US (1=yes)	0.03	a	3789	0.28	d	1000	0.03	1613
Lived with both biological parents at age 14 (1=yes)	0.80	a,d	3784	0.65	d	999	0.52	1610
Persistent poverty status			2062			823		1278
Never	0.63	a,d		0.43	d		0.33	
Less than half of study	0.33	a,d		0.41			0.45	
Half of study or more	0.04	a,d		0.16	d		0.22	
Year over 40								
1998	0.17		2065	0.16		824	0.16	1280
2000	0.26			0.24			0.24	
2002	0.24			0.22			0.25	
2004	0.27			0.27			0.25	
2006	0.07	b,e		0.11			0.10	

a = significantly different from Hispanic (same gender) at $p < .001$
b = significantly different from Hispanic (same gender) at $p < .01$
c = significantly different from Hispanic (same gender) at $p < .05$
d = significantly different from black (same gender) at $p < .001$
e = significantly different from black (same gender) at $p < .01$
f = significantly different from black (same gender) at $p < .05$
g = measured in 1998

Table 2. Decomposition of Mean Difference in Women's Depressive Symptoms (Logged CESD Score, 1.95-3.33) by Race and Ethnicity, NLSY 1979 Cohort[a,b]

	White (1) and Hispanic (2) Women			White (1) and Black (2) Women			Hispanic (1) and Black (2) Women		
	Coef.	s.e		Coef.	s.e		Coef.	s.e	
Group 1	2.28	0.01	***	2.28	0.01	***	2.28	0.02	***
Group 2	2.28	0.02	***	2.36	0.01	***	2.36	0.01	***
Difference	0.00	0.02		-0.08	0.02	***	-0.08	0.02	***
Compositions									
Education	-0.01	0.01		-0.01	0.01		0.00	0.00	
BMI	0.00	0.01		0.00	0.01		0.00	0.00	
Married	-0.01	0.00		-0.01	0.01		-0.01	0.01	
Health in 1979	0.00	0.00		0.00	0.00		0.00	0.00	
Born outside US	0.01	0.01		0.00	0.00		0.01	0.01	
Lived with parents at age 14	0.00	0.00		0.01	0.01		0.01	0.00	
Persistent poverty status	-0.01	0.01		0.01	0.01		0.00	0.01	
Perceived neighborhood problems	0.00	0.01		-0.03	0.01	***	-0.01	0.00	**
Smoker	0.01	0.01		0.00	0.00		0.00	0.00	
Children ever born	0.01	0.01		0.00	0.00		0.00	0.00	
Health plan coverage	0.00	0.00		0.00	0.00		0.00	0.00	
Net worth	0.00	0.01		-0.04	0.02	*	-0.02	0.01	*
Poverty status	-0.01	0.01	*	-0.01	0.01		0.00	0.00	
Any time unemployed	0.00	0.00		0.00	0.00		0.00	0.00	
Any time out of labor force	0.00	0.00		0.00	0.00		0.00	0.00	
Year over 40	0.00	0.00		0.00	0.00		0.00	0.00	
Total	-0.02	0.02		-0.07	0.02	***	-0.02	0.02	

Associations							
Education	-0.02	0.01	-0.01	0.01	0.01	0.01	
BMI	0.01	0.01	0.00	0.00	-0.01	0.00	
Married	0.02	0.02	0.01	0.01	-0.01	0.02	
Health in 1979	0.00	0.00	0.00	0.00	0.00	0.00	
Born outside US	0.01	0.01	0.00	0.00	0.00	0.00	
Lived with parents at age 14	0.01	0.03	-0.04	0.02 *	-0.04	0.02	*
Persistent poverty status	0.00	0.01	0.00	0.00	0.02	0.01	**
Perceived neighborhood problems	0.04	0.02	0.01	0.02	-0.04	0.03	
Smoker	0.00	0.01	0.02	0.01 *	0.02	0.01	
Children ever born	0.02	0.03	0.00	0.02	-0.02	0.03	
Health plan coverage	0.06	0.04	0.08	0.04 *	0.02	0.04	
Net worth	0.00	0.01	0.00	0.01	-0.03	0.01	
Poverty status	-0.02	0.01	0.00	0.01	0.03	0.02	
Any time unemployed	0.01	0.01	0.01	0.01	0.00	0.01	
Any time out of labor force	0.00	0.01	0.00	0.01	0.00	0.01	
Year over 40	-0.02	0.01	-0.02	0.01	0.01	0.01	
Constant	-0.07	0.07	-0.01	0.06	0.06	0.08	
Total	0.04	0.02	0.05	0.02 *	0.01	0.02	
Interaction							
Education	0.00	0.01	0.00	0.01	0.00	0.00	
BMI	-0.01	0.01	-0.01	0.01	-0.01	0.01	
Married	0.01	0.00	0.01	0.01	0.00	0.01	
Health in 1979	0.00	0.00	0.00	0.00	0.00	0.00	
Born outside US	0.00	0.01	0.00	0.00	-0.02	0.02	
Lived with parents at age 14	0.00	0.01	-0.02	0.01	-0.01	0.01	*
Persistent poverty status	0.01	0.01	-0.02	0.02	-0.02	0.01	*
Perceived neighborhood problems	-0.01	0.01	-0.01	0.01	0.01	0.01	
Smoker	0.00	0.01	0.00	0.00	-0.01	0.01	

Children ever born	0.00	0.01		0.00	0.00		0.00	0.00	
Health plan coverage	0.01	0.00		0.01	0.00		0.00	0.00	
Net worth	-0.03	0.01	**	-0.01	0.02		0.02	0.01	
Poverty status	0.01	0.01		0.00	0.01		-0.01	0.01	
Any time unemployed	0.00	0.00		0.00	0.00		0.00	0.00	
Any time out of labor force	0.00	0.00		0.00	0.00		0.00	0.00	
Year over 40	0.00	0.00		0.00	0.00		0.00	0.00	
Total	-0.02	0.02		-0.05	0.02	*	-0.07	0.02	**

Coef. = coefficient, s.e. = standard error. *** = p<.001, ** = p<.01, * = p<.05

[a]N= 1466 white women, 487 Hispanic women, 803 black women.

[b]Decomposition of categorical variables is conducted using transformations of deviations from the grand mean so that the results are the same irrespective of the base category chosen (Jann 2008; Suits 1984; Yun 2005).

Table 3. Decomposition of Mean Difference in Men's Depressive Symptoms (Logged CESD Score, 1.95-3.33) by Race and Ethnicity, NLSY 1979 Cohort[a,b]

	White (1) and Hispanic (2) Men			White (1) and Black (2) Men			Hispanic (1) and Black (2) Men		
	Coef.	s.e		Coef.	s.e		Coef.	s.e	
Group 1	2.20	0.01	***	2.20	0.01	***	2.22	0.01	***
Group 2	2.22	0.01	***	2.25	0.01	***	2.25	0.01	***
Difference	-0.02	0.02		-0.05	0.01	***	-0.03	0.02	
Compositions									
Education	-0.01	0.01		-0.01	0.01		0.01	0.00	
BMI	-0.01	0.00		0.00	0.00		0.00	0.00	
Married	0.00	0.00		-0.01	0.01		0.00	0.01	
Health in 1979	0.00	0.00		0.00	0.00		0.00	0.00	
Born outside US	0.00	0.01		0.00	0.00		-0.01	0.02	
Lived with parents at age 14	0.00	0.00		0.01	0.01		0.00	0.00	
Persistent poverty status	0.00	0.01		-0.01	0.01		0.00	0.00	
Smoker	0.00	0.00		0.00	0.00		0.00	0.00	
Children ever born	0.00	0.00		0.00	0.00		0.00	0.00	
Health plan coverage	0.00	0.00		0.00	0.00		0.00	0.00	
Net worth	0.00	0.01		-0.03	0.01		-0.01	0.01	
Poverty status	-0.01	0.00	**	-0.01	0.01		-0.01	0.00	
Any time unemployed	0.00	0.00		0.00	0.00		0.00	0.00	
Any time out of labor force	-0.01	0.00		-0.01	0.00	***	-0.01	0.00	*
Year over 40	0.00	0.00		0.00	0.00		0.00	0.00	
Total	-0.04	0.01	*	-0.08	0.02	***	-0.03	0.02	

Associations								
Education	-0.01	0.01		0.00	0.01		0.01	0.01
BMI	0.01	0.01		0.00	0.01		-0.01	0.01
Married	0.01	0.02		0.00	0.01		-0.01	0.02
Health in 1979	0.00	0.00		0.00	0.00		0.00	0.00
Born outside US	0.01	0.01		0.00	0.00		0.00	0.00
Lived with parents at age 14	0.00	0.02		0.00	0.02		-0.01	0.02
Persistent poverty status	-0.02	0.01		-0.01	0.01		0.00	0.01
Smoker	0.00	0.01		0.00	0.01		0.00	0.01
Children ever born	0.02	0.02		0.03	0.02		0.01	0.02
Health plan coverage	-0.02	0.03		0.01	0.03		0.03	0.04
Net worth	0.00	0.00		0.00	0.01		-0.02	0.01
Poverty status	-0.01	0.01		0.00	0.01		0.03	0.01
Any time unemployed	0.01	0.01		0.00	0.01		-0.01	0.01
Any time out of labor force	0.00	0.01		-0.01	0.01		0.00	0.01
Year over 40	0.02	0.01		0.01	0.01		-0.01	0.01
Constant	0.02	0.06		0.01	0.05		-0.01	0.06
Total	0.04	0.02	*	0.04	0.02	*	0.01	0.02
Interaction								
Education	0.00	0.01		0.00	0.01		-0.01	0.01
BMI	0.00	0.00		0.00	0.00		0.00	0.00
Married	0.00	0.00		0.00	0.01		0.00	0.01
Health in 1979	0.00	0.00		0.00	0.00		0.00	0.00
Born outside US	-0.01	0.01		0.00	0.00		0.00	0.02
Lived with parents at age 14	0.00	0.01		0.00	0.01		0.00	0.01
Persistent poverty status	-0.01	0.01		-0.02	0.01		0.00	0.01
Smoker	0.00	0.00		0.00	0.00		0.00	0.00
Children ever born	0.00	0.01		-0.01	0.00		0.00	0.00

Health plan coverage	0.00	0.00	0.00	0.00	0.00	0.00
Net worth	-0.01	0.01	0.00	0.02	0.01	0.01
Poverty status	0.01	0.00	0.00	0.01	-0.01	0.01
Any time unemployed	0.00	0.00	0.00	0.00	0.00	0.00
Any time out of labor force	0.00	0.00	0.00	0.00	0.00	0.00
Year over 40	0.00	0.00	0.00	0.00	0.00	0.00
Total	-0.03	0.02	-0.02	0.02	-0.01	0.02

Coef. = coefficient, s.e. = standard error. *** = p<.001, ** = p<.01, * = p<.05

[a]N= 1541 white men, 508 Hispanic men, 751 black men

[b]Decomposition of categorical variables is conducted using transformations of deviations from the grand mean so that the results are the same irrespective of the base category chosen (Jann 2008; Suits 1984; Yun 2005).

Table 4. Decomposition of Mean Difference in Women's Poor Physical Health (Logged SF12 Physical Components Score, 0-4.06) by Race and Ethnicity, NLSY 1979 Cohort[a,b]

	White (1) and Hispanic (2) Women			White (1) and Black (2) Women			Hispanic (1) and Black (2) Women		
	Coef.	s.e		Coef.	s.e		Coef.	s.e	
Group 1	2.76	0.01	***	2.76	0.01	***	2.76	0.02	***
Group 2	2.76	0.02	***	2.85	0.01	***	2.85	0.01	***
Difference	0.00	0.02		-0.09	0.02	***	-0.08	0.02	***
Compositions									
Education	-0.01	0.01		0.00	0.01		0.00	0.00	
BMI	-0.02	0.01	**	-0.03	0.01	***	-0.02	0.00	***
Married	0.00	0.00		0.00	0.01		0.00	0.01	
Health in 1979	0.00	0.00		0.00	0.00		0.00	0.00	
Born outside US	0.01	0.01		0.00	0.00		0.00	0.01	
Lived with parents at age 14	0.00	0.00		0.01	0.01		0.01	0.00	
Persistent poverty status	-0.01	0.01		-0.03	0.01	*	-0.02	0.01	*
Perceived neighborhood problems	0.00	0.00		-0.02	0.01	***	-0.01	0.00	**
Smoker	0.00	0.00		0.00	0.00		0.00	0.00	
Children ever born	0.01	0.01	*	0.01	0.00	*	0.00	0.00	
Health plan coverage	0.00	0.00		0.01	0.00	*	0.00	0.00	
Net worth	0.00	0.01		-0.01	0.02		0.00	0.01	
Poverty status	-0.01	0.01	*	-0.01	0.01		-0.01	0.00	
Any time unemployed	0.00	0.00		0.00	0.00		0.00	0.00	
Any time out of labor force	0.00	0.00		0.00	0.00		0.00	0.01	
Year over 40	0.00	0.00		0.00	0.00		0.00	0.00	
Total	-0.02	0.02		-0.09	0.02	***	-0.05	0.02	**

Associations									
Education	-0.01	0.01		0.00	0.01		0.01	0.01	
BMI	0.00	0.01		0.00	0.00		0.00	0.00	
Married	0.04	0.02		0.01	0.01		-0.01	0.02	
Health in 1979	0.00	0.00		0.00	0.00		0.00	0.00	
Born outside US	0.00	0.02		0.00	0.00		0.00	0.00	
Lived with parents at age 14	-0.03	0.03		-0.05	0.02	**	-0.03	0.02	
Persistent poverty status	-0.01	0.01		-0.01	0.01		-0.01	0.01	
Perceived neighborhood problems	0.02	0.02		-0.02	0.02		-0.04	0.02	
Smoker	0.00	0.01		0.01	0.01		0.01	0.01	
Children ever born	0.01	0.03		-0.01	0.03		-0.02	0.03	
Health plan coverage	0.01	0.04		-0.03	0.04		-0.04	0.04	
Net worth	-0.01	0.01		0.01	0.01		-0.01	0.01	
Poverty status	-0.02	0.01		-0.01	0.01		0.02	0.02	
Any time unemployed	-0.01	0.01		0.00	0.01		0.01	0.01	
Any time out of labor force	0.02	0.01		-0.02	0.01		-0.04	0.01	**
Year over 40	0.01	0.01		0.01	0.01		0.00	0.01	
Constant	0.04	0.07		0.17	0.06	**	0.13	0.08	
Total	0.06	0.02	**	0.06	0.02	**	0.00	0.02	
Interaction									
Education	-0.01	0.01		-0.01	0.01		0.00	0.00	
BMI	-0.01	0.01		-0.02	0.01		-0.01	0.01	
Married	0.01	0.00		0.01	0.01		-0.01	0.01	
Health in 1979	0.00	0.00		0.00	0.00		0.00	0.00	
Born outside US	0.00	0.01		0.00	0.00		-0.01	0.02	
Lived with parents at age 14	-0.01	0.00		-0.03	0.01	*	-0.01	0.01	
Persistent poverty status	-0.01	0.01		-0.01	0.02		0.01	0.01	
Perceived neighborhood problems	-0.01	0.01		0.01	0.01		0.01	0.01	

Smoker	0.00	0.01		0.00	0.00		0.00	0.01
Children ever born	0.00	0.01		0.00	0.00		0.00	0.00
Health plan coverage	0.00	0.00		0.00	0.00		0.00	0.00
Net worth	-0.02	0.01		-0.03	0.02		0.00	0.01
Poverty status	0.01	0.01		0.01	0.01		-0.01	0.01
Any time unemployed	0.00	0.00		0.00	0.00		0.00	0.00
Any time out of labor force	0.00	0.00		0.00	0.00		0.00	0.00
Year over 40	0.00	0.00		0.00	0.00		0.00	0.00
Total	-0.04	0.02	*	-0.06	0.03	*	-0.02	0.02

Coef. = coefficient, s.e. = standard error. *** = p<.001, ** = p<.01, * = p<.05

[a]N= 1465 white women, 492 Hispanic women, 811 black women

[b]Decomposition of categorical variables is conducted using transformations of deviations from the grand mean so that the results are the same irrespective of the base category chosen (Jann 2008; Suits 1984; Yun 2005).

Table 5. Decomposition of Mean Difference in Men's Poor Physical Health (Logged SF12 Physical Components Score, 0-4.06) by Race and Ethnicity, NLSY 1979 Cohort[a,b]

	White (1) and Hispanic (2) Men			White (1) and Black (2) Men			Hispanic (1) and Black (2) Men		
	Coef.	s.e		Coef.	s.e		Coef.	s.e	
Group 1	2.72	0.01	***	2.72	0.01	***	2.78	0.02	***
Group 2	2.78	0.02	***	2.77	0.01	***	2.77	0.01	***
Difference	-0.06	0.02	***	-0.05	0.01	***	0.01	0.02	
Compositions									
Education	-0.02	0.01	*	-0.01	0.01		0.00	0.00	
BMI	-0.02	0.01	***	-0.01	0.00	**	0.00	0.00	
Married	0.01	0.00		0.00	0.01		0.00	0.01	
Health in 1979	0.00	0.00		0.00	0.00		0.00	0.00	
Born outside US	0.00	0.01		0.00	0.00		-0.01	0.02	
Lived with parents at age 14	0.00	0.00		0.01	0.01		0.00	0.00	
Persistent poverty status	-0.01	0.01		-0.01	0.01		0.00	0.00	
Smoker	0.00	0.00		0.00	0.00		0.00	0.00	
Children ever born	0.01	0.00	*	0.00	0.00		0.00	0.00	
Health plan coverage	0.01	0.00	*	0.01	0.00	***	0.00	0.00	
Net worth	-0.02	0.01		-0.02	0.01		-0.01	0.01	
Poverty status	0.00	0.00		-0.01	0.01	*	-0.01	0.00	*
Any time unemployed	0.01	0.00	*	0.00	0.00		0.00	0.00	
Any time out of labor force	-0.01	0.01	*	-0.03	0.01	***	-0.02	0.01	**
Year over 40	0.00	0.00		0.00	0.00		0.00	0.00	
Total	-0.04	0.02	*	-0.06	0.02	***	-0.03	0.02	

Associations										
Education	-0.01	0.01		0.01	0.01		0.02	0.01		
BMI	0.01	0.01		0.01	0.01		-0.01	0.01		
Married	-0.02	0.02		0.01	0.01		0.02	0.02		
Health in 1979	0.00	0.00		0.00	0.00		0.01	0.00		
Born outside US	0.02	0.01		0.00	0.00		0.00	0.00		
Lived with parents at age 14	0.00	0.02		0.00	0.02		-0.01	0.02		
Persistent poverty status	-0.01	0.01		-0.01	0.01		-0.01	0.01		
Smoker	0.01	0.01		0.02	0.01	*	0.01	0.01		
Children ever born	0.03	0.02		-0.04	0.02		-0.07	0.02	**	
Health plan coverage	-0.04	0.03		-0.06	0.03	*	-0.03	0.03		
Net worth	0.01	0.00		-0.01	0.01		0.00	0.01		
Poverty status	0.00	0.01		0.00	0.01		-0.01	0.01		
Any time unemployed	0.02	0.01	*	0.01	0.01		-0.01	0.01		
Any time out of labor force	-0.02	0.01	**	-0.02	0.01	*	0.01	0.01		
Year over 40	0.01	0.01		0.00	0.01		-0.01	0.01		
Constant	-0.02	0.06		0.10	0.05		0.12	0.06		
Total	0.00	0.02		0.01	0.02		0.04	0.02		
Interaction										
Education	0.00	0.01		-0.01	0.01		-0.01	0.01		
BMI	0.00	0.00		0.00	0.00		0.00	0.00		
Married	0.00	0.00		0.01	0.01		0.01	0.01		
Health in 1979	0.00	0.00		0.00	0.00		0.00	0.00		
Born outside US	-0.02	0.01		0.00	0.00		0.00	0.02		
Lived with parents at age 14	0.00	0.01		0.00	0.01		0.00	0.01		
Persistent poverty status	-0.01	0.01		-0.01	0.01		0.00	0.00		
Smoker	0.00	0.00		0.00	0.00		0.00	0.00		
Children ever born	-0.01	0.01		0.01	0.00		0.00	0.00		
Health plan coverage	0.00	0.00		-0.01	0.00	*	0.00	0.00		
Net worth	0.01	0.01		0.02	0.02		0.00	0.01		
Poverty status	0.00	0.00		0.00	0.01		0.00	0.01		

Any time unemployed	-0.01	0.00	0.00	0.00		0.00	0.00
Any time out of labor force	0.01	0.00	0.01	0.00	*	0.00	0.00
Year over 40	0.00	0.00	0.00	0.00		0.00	0.00
Total	-0.02	0.02	0.01	0.02		0.00	0.02

Coef. = coefficient, s.e. = standard error. *** = p<.001, ** = p<.01, * = p<.05

[a]N=1547 white men, 510 Hispanic men, 755 black men

[b]Decomposition of categorical variables is conducted using transformations of deviations from the grand mean so that the results are the same irrespective of the base category chosen (Jann 2008; Suits 1984; Yun 2005).