Perceived Discrimination and Physical, Cognitive, and Emotional Health in Older Adulthood

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Abstract

Objective—To examine whether perceived discrimination based on multiple personal characteristics is associated with physical, emotional, and cognitive health concurrently, prospectively, and with change in health over time among older adults.

Design—: Longitudinal

Setting—Health and Retirement Study (HRS)

Participants—Participants (*N*=7,622) who completed the Leave-Behind Questionnaire as part of the 2006 HRS assessment (mean age 67); participants (*n*=6,450) completed the same health measures again in 2010.

Measurements—Participants rated their everyday experience with discrimination and attributed those experiences to eight personal characteristics: race, ancestry, sex, age, weight, physical disability, appearance, and/or sexual orientation. At both the 2006 and 2010 assessments, participants completed measures of physical health (subjective health, disease burden), emotional health (life satisfaction, loneliness), and cognitive health (memory, mental status).

Results—Discrimination based on age, weight, physical disability, and appearance was associated with poor subjective health, greater disease burden, lower life satisfaction and greater loneliness at both assessments and with declines in health across the four years. Discrimination based on race, ancestry, sex, and sexual orientation was associated with greater loneliness at both time points, but not with change over time. Discrimination was mostly unrelated to cognitive health.

Conclusions—The detrimental effect of discrimination on physical and emotional health is not limited to young adulthood but continues to contribute to health and well-being in old age. These effects were driven primarily by discrimination based on personal characteristics that change over time (e.g., age, weight) rather than discrimination based on more stable characteristics (e.g., race, sex).

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Objective

It is not uncommon for people to be treated unfairly on the basis of a personal characteristic (1). Such treatment has been most well documented for race and sex, but discrimination can be based on any number of factors, including age, weight, and sexual orientation. There are significant consequences to these experiences: Perceived discrimination is harmful to both physical and mental health (2, 3). It has been linked, for example, to a number of indicators of physical health, including elevated C-reactive protein (4) and ambulatory blood pressure (5), and significant health outcomes, including mortality (6). Individuals who perceive discrimination are also at greater risk for depressive symptoms (7), major depression (8), and psychological distress (9).

Stress and coping models have been developed to describe how the experience of discrimination contributes to poor health (10). Within these models, perceived discrimination is identified as a chronic stressor that has particularly detrimental effects on health because it is uncontrollable and unpredictable (2, 3). Physiological and behavioral mechanisms have both been implicated in the association between discrimination and health. Discrimination, for example, has been associated with greater oxidative stress (11) and heightened physiological stress response (2), which increase risk for morbidity and mortality. Individuals who experience discrimination may also engage in unhealthy behaviors (e.g., smoking) (12), and the stress of discrimination may reduce the psychological resources necessary to constrain behavior and make healthy choices (13).

These models were developed to illustrate how discrimination based on race/ethnicity contributes to poor health (3). Discrimination based on other characteristics, however, has also been implicated in health and health-risk behaviors. For example, women who perceive sex discrimination are at greater risk for smoking (14) and discrimination based on sexual orientation is associated with worse cardiovascular health (15). Thus, discrimination based on a broad range of personal characteristics may have implications for health.

Research on discrimination and health has concentrated primarily on adolescents and young to middle-aged adults; comparatively less research has focused on older adults. Discrimination continues to occur as adults get older and some forms of discrimination become more relevant and more prevalent with age, most notably age discrimination (1). Given that the risk of significant illness also increases with age, it is particularly important to examine how discrimination contributes to disease and the progression of disease at older ages. Related research on aging stereotypes suggests that older adults who internalize negative attitudes toward aging are at increased risk for functional (16) and cognitive decline (17, 18), and initial evidence indicates that perceived discrimination among older adults is associated with declines in health over two years (19).

The present research takes a comprehensive approach to perceived discrimination and health in several ways. First, in contrast to previous research that typically focused on discrimination based on one personal characteristic (race, sex, age, etc.) or an aggregate, we examine whether discrimination based on eight personal characteristics shares similar or different associations with health outcomes. Second, we test the effect of discrimination on three domains of health – physical, emotional, and cognitive – to examine whether different forms of discrimination have differential associations with these aspects of health. Third, we test the longitudinal association between discrimination and change in physical, emotional, and cognitive health across four years to examine whether discrimination is associated with changes in health over time. Based on existing stress and coping models (2) and prior research on discrimination and health-risk behaviors (12), we hypothesize that discrimination, regardless of which personal characteristic it is based, will be associated with worse physical, emotional, and cognitive health at baseline, follow-up, and change across the four-year interval.

Method

Participants

Participants were drawn from the Health and Retirement Study (HRS), a nationally representative longitudinal study of Americans ages 50 and older (20). HRS participants are re-interviewed every two years. Starting in 2006, the psychosocial questionnaire that participants completed at home and returned by mail included items about perceived discrimination (see below). We used the 2006 assessment as the baseline for the health measures, since discrimination was first measured in this assessment. We used the health measures from the 2010 assessment as the follow-up to have the longest longitudinal interval between assessments. A total of 7,622 participants (58.8% female) completed the discrimination measure at baseline. These participants were, on average, 67.54 (*SD*=10.64) years old, had an average of 12.61 (*SD*=3.09) years of education, and were 84.4% white, 13.0% African-American, and 2.6% other ethnicities (self-reported). At follow-up, 6,450 participants had data on at least one health measure. See supplemental material for attrition information. Due to incomplete data, sample sizes for each analysis ranged from 4,593 (mental status) to 7,614 (subjective health) at baseline and from 4,234 (mental status) to 6,445 (subjective health) at follow-up. Participants signed a consent form approved by the IRB at the University of Michigan. HRS data is publically available for download at http://hrsonline.isr.umich.edu/.

Measures

Discrimination—. Participants rated their experience of everyday discrimination (21) and then attributed those experiences to a number of personal characteristics (1). Specifically, participants were asked, "If any of the above have happened to you, what do you think were the reasons why these experiences happened to you? (Mark all that apply.)" They could attribute the experiences (yes/no) to race, ancestry, sex, age, weight, physical disability, other aspects of physical appearance, and/or sexual orientation. Participants could endorse as many or as few as necessary. Although single-item measures are not ideal, they have been used successfully to examine the effect of race (12) and sex (22) discrimination on smoking,

track trends in weight discrimination over time (23), and document the correlates of weight bias (24).

Physical health—Physical health was assessed with two measures: subjective health and disease burden. Subjective health was measured with the question: Would you say your health is excellent, very good, good, fair, or poor? Single-item subjective health measures are reliable and valid (25). At each assessment, participants reported a detailed medical history, including major diagnoses. We computed disease burden as the sum of high blood pressure, diabetes, any cancer (except skin), heart condition, stroke, and arthritis.

Emotional health—Emotional health was evaluated as life satisfaction and loneliness. Participants completed the 5-item Satisfaction With Life Scale (e.g., "I am satisfied with my life." (26)). Participants rated items from *strongly disagree* to *strongly agree*. In 2006 the response scale ranged from 1-6 and from 1-7 in 2010. To account for this difference, we analyzed z-scores from each assessment. Participants also rated three loneliness items (e.g., "How much of the time do you feel left out?") from Hughes and colleagues (27) on a scale from 1 (*hardly ever or never*) to 3 (*often*) at both assessments.

Cognitive health—Cognitive health was assessed with tasks that measured memory and mental status (28, 29). For the memory task, participants were given a list of 10 words that they recalled immediately and after a five-minute delay. We used the sum of words recalled across the immediate and delayed recall (range 0-20). Mental status was assessed in HRS with a measure similar to the Mini-Mental State Exam, with items on knowledge, language, and orientation. Scores could range from 0 to 15.

Covariates—Secondary analyses controlled for baseline BMI (*M*=28.41, *SD* = 5.81) and smoking (51.3% ever smokers).

Statistical Approach

We tested the association between discrimination and the indices of health in several ways. We first did regression analyses to predict baseline health from baseline discrimination, controlling for relevant demographic factors (age, age squared, sex, ethnicity, education). We included age squared to account for nonlinear changes in older adulthood. We repeated the analyses using follow-up health as the outcome, controlling for the same covariates. To assess whether discrimination was associated with change in the health indices, we predicted health at follow-up from baseline discrimination, controlling for baseline health and the covariates. We then repeated these analyses controlling for BMI and smoking history to address whether these associations were independent of some risk factors for declines in health.

The effect of discrimination on health may be more harmful for the groups that are typically the target of that discrimination. For example, the effect of sex discrimination on health may be stronger for women than for men. To test this possibility, we used Aiken and West's (30) approach to interactions to test whether the association between sex, race, and age discrimination on the health outcomes varied by sex, race, and age, respectively.

All analyses were weighted using HRS's sampling weights for the 2006 Leave-Behind Questionnaire (31) using the Complex Samples module in IBM-SPSS version 21 to account the complex sampling procedure in HRS. We report the weighted results below, but the findings were virtually identical when the sampling weights were not included.[1] Because of the large sample size and number of tests, we set p to <.01 for all analyses.

Results

Table 1 shows descriptive statistics for all variables. In this sample, perceived discrimination based on age was the most prevalent (30.1%), whereas perceived discrimination based on sexual orientation was the least prevalent (1.7%). Across the entire sample, physical and cognitive health generally declined, whereas emotional health somewhat improved.

Physical health

A fairly consistent pattern emerged across the two indices of physical health (Table 2). Participants who reported experiencing discrimination based on age, weight, physical disability or other aspects of their appearance reported worse subjective health and higher burden of disease. The associations were similar for health reported at both baseline and follow-up. Discrimination based on age, weight, or physical disability was also associated with declines in physical health over the four-year follow-up period. Sex discrimination was associated with lower self-rated health at baseline, but not at follow-up or change. The associations between discrimination and self-rated health were similar in magnitude to the associations between age, sex, and ethnicity and self-rated health, and the associations between discrimination and disease burden were similar to the associations between sex, ethnicity, and education and disease burden. All findings remained significant after controlling for BMI and smoking, with the exception of appearance and disease burden at follow-up and weight discrimination and change in disease burden between assessments.

Emotional health

Similar to physical health (Table 3), participants who reported discrimination based on age, weight, physical disability or appearance reported lower life satisfaction at both baseline and follow-up and declined in life satisfaction between these two assessments; race discrimination was also associated with lower life satisfaction at baseline. These associations were of similar or greater magnitude to that of age, sex, ethnicity, and education and life satisfaction. A slightly different pattern emerged for loneliness. Every type of discrimination assessed in the current study was associated with greater feelings of loneliness at both baseline and follow-up. Similar to physical health and life satisfaction, participants who reported discrimination based on age, weight, physical disability, or appearance also increased in loneliness between baseline and follow-up. These effects were of similar or greater magnitude to that of age, sex, ethnicity, and education and loneliness. All effects persisted after controlling for BMI and smoking.

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[1]We also ran the analyses additionally accounting for strata and primary sampling units in HRS (see Supplementary Tables 4-6). The pattern of results was virtually identical to both the raw analyses and the analyses accounting only for the sampling weights for the psychosocial questionnaire.

Cognitive health

In contrast to physical and emotional health, we found very few associations between perceived discrimination and cognitive health (Table 4). For the memory task, individuals who reported sex discrimination performed better on the memory task at both baseline and follow-up whereas those who reported discrimination based on a physical disability had lower scores at both baseline and follow-up and declined in memory across the follow-up period; race discrimination was also associated with lower performance on the memory task at baseline and discrimination based on sexual orientation was associated with lower performance at follow-up. Sex discrimination was associated with better mental status at baseline and at follow-up. Finally, discrimination based on physical disability was associated with lower mental status at both assessments, but not with change over time. None of the other types of discrimination were associated with either cognitive measure. In general, the associations were smaller than that of the demographic factors on cognitive health. The pattern of associations was the same when controlling for BMI and smoking.

Moderators

Surprisingly, we found that most effects of discrimination did not vary by demographic characteristics. Age and sex did not moderate the association between discrimination based on age or sex, respectively, and the health outcomes. The most consistent effects we found for race discrimination were for cognitive health: White participants who perceived discrimination based on their race scored lower on mental status, whereas African-American participants who perceived race discrimination scored higher. This interaction was significant at baseline ($\beta_{\text{discrimination} \times \text{race}}[t(4585)=2.95]=.06$, $p<.01$) and follow-up ($\beta_{\text{discrimination} \times \text{race}}[t(4226)=4.89]=.12$, $p<.01$), but not for change over time ($\beta_{\text{discrimination} \times \text{race}}[t(3365)=2.40]=.05$, $p=.02$). There was also a significant interaction between race and race discrimination for change in loneliness ($\beta_{\text{discrimination} \times \text{race}}[t(5057)=2.95]=.06$, $p<.01$), but not for loneliness at either time point (Baseline: $\beta_{\text{discrimination} \times \text{race}}[t(7539)=2.49]=-.05$, $p=.02$; Follow-up: $\beta_{\text{discrimination} \times \text{race}}[t(5509)=.32]=.00$, $p=.75$).

Conclusions

In a large sample of older adults, we examined whether perceived discrimination based on different personal characteristics was associated with aspects of physical, emotional, and cognitive health. We found pervasive effects for discrimination based on age, weight, physical disability, and appearance: Discrimination based on these characteristics was associated with poor subjective health, greater disease burden, lower life satisfaction and greater loneliness when measured at the same time, when these health indices were measured four years later, and with change for the worse across this period. Fewer effects emerged for discrimination based on other factors.

Experiences with discrimination have long been implicated in physical and emotional health (2, 3). The effect of discrimination on health is typically examined in the context of discrimination based on one personal characteristic (e.g., race, sex). In the current study, examining discrimination based on several factors revealed some surprising results:

Perceived discrimination based on race, sex, ancestry, and sexual orientation was largely unrelated to the indices of health. In contrast, perceived discrimination based on age, weight, physical disability, or appearance had consistent associations with poor physical and emotional health.

Of note, all of the personal factors that had the most consistent relation with physical and emotional health tend to change over time. That is, people get older, weight fluctuates, and the visibility of a physical disability may become more (or less) pronounced. With few exceptions, race, ancestry, sex, and sexual orientation are fixed characteristics of the person that remain the same across the lifespan. As such, participants in the current study had lived with these characteristics for over 50 years and may have developed some resilience against discrimination. Since age, weight, physical disability and appearance change over time, people may have difficulty adapting to the changing nature of the characteristic. Discrimination based on characteristics that fluctuate may be particularly harmful to older adults because it can call attention to physical aspects of the person that may not yet be integrated into the person's identity. In addition, there may be support systems for women, African-Americans, sexual minorities, and ancestry that buffer against the stress of discrimination. In contrast, there are not necessarily readily available support systems for individuals who are over (or under) weight, aging, etc. And, in some cases, support systems that are typically beneficial, may actually contribute to the harm. For example, individuals who are struggling with their weight often report that the discrimination they experience is at the hands of their family and friends (32).

Of all of the indices of health that we examined, discrimination had the most pervasive associations with loneliness: Discrimination based on every characteristic assessed in the current study was associated with greater feelings of loneliness. Humans have a strong need to belong, and people often feel distressed when they do not have their desired social relationships (33-35). Results from the present research suggest that perceiving a hostile society is associated with pervasive feelings of loneliness. An individual may interpret discrimination as an indication that they do not fit in the society in which they live. Loneliness may be one mechanism that contributes to the relation between discrimination and morbidity and mortality. Discrimination may elicit feelings of being left out, and chronic loneliness increases risk for unhealthy behaviors, sleep disturbances, cardiovascular risk factors (e.g., high blood pressure; for a review see (33)), and suicide (36).

Surprisingly, we found little evidence that the effects were moderated by the relevant demographic characteristic (e.g., the effect of sex discrimination on health did not vary by sex). When the analyses were run separately for different demographic groups (e.g., by sex), the effects were typically stronger for the at-risk group, but the low-risk group also showed the same general pattern. This similarity suggests that the consequences of discrimination may be the same regardless of the historical differences between groups. It may also be the case that rather than just perceiving race and sex discrimination, the discrimination needs to be internalized for it to increase risk for poor health (37).

The one exception to this pattern was discrimination based on race and cognitive health. In general, African Americans who perceived racial discrimination had better cognitive health,

whereas white participants who perceived discrimination based on their race performed worse on the cognitive tasks. There are gender, socioeconomic, and regional differences, among others, in the reporting of racial discrimination (38). For example, African-Americans with higher socioeconomic status are more likely to report experiencing racial discrimination, whereas racial discrimination is more commonly reported among white individuals with lower SES. Interestingly, although the interaction was not significant, we found a similar pattern for sex discrimination: experiencing sex discrimination was more strongly associated with better cognitive functioning among women than men. It is possible that African Americans and women with better cognitive functioning may be in positions where discrimination is more likely (e.g., workplace) and are better able to recognize and label it. They may also have the resources to buffer against the negative consequences of discrimination and continue to strive intellectually in the face of social adversity. Indeed, experimental evidence suggests that historically disadvantaged groups are more persistent than their non-disadvantaged counterparts under situations of threat (39). Overall, however, it is of note that discrimination in general was largely unrelated to cognitive health.

The magnitude of the effects found in the current research should be put in context. For example, the seemingly modest correlation between age discrimination and disease burden at baseline (r=.04) translated into a mean difference of .11 more diseases among participants who reported experiencing age discrimination than participants who had not experienced such discrimination, controlling for the covariates. Across the 2,294 participants who reported age discrimination, this difference translated into approximately 312 more diseases at baseline. Over the four years, the association between age discrimination and change in disease translated into approximately 130 additional diseases. As such, at follow-up, participants who experienced age discrimination had almost 450 more diseases than participants who had not experienced such discrimination. As another example, the effect of age discrimination on life satisfaction translated into approximately 1/4 SD lower life satisfaction for those who experienced discrimination at baseline and approximately 1/6 SD greater decline in life satisfaction over the four years, an effect similar to that of education. Thus, although seemingly modest, the effect of discrimination on health is clinically meaningful at the population level.

This study had several strengths including indices of health status across multiple domains, a discrimination measure based on eight different aspects of the individual, a large sample of older adults, and longitudinal design. Some limitations could be addressed in future research. First, our measure of discrimination was limited to one item per characteristic and did not capture whether the discrimination was chronic or acute or whether it was domain-specific (e.g., discrimination at work) or more global. Still, it is worth noting that even with such a crude measure, we found consistent effects across two time points and across multiple health indicators. Second, we did not examine mediators of the associations; future research could test behavioral and physiological mechanisms that link discrimination to health. Third, our sample was composed of older adults. Although we see this as a great strength of the current research, it would be interesting to examine whether the effects generalize to younger populations. In particular, discrimination based on relatively fixed characteristics (e.g., race, sex) may be more harmful earlier in adulthood, whereas

discrimination based on characteristics that change over time may be more harmful later in adulthood. Future research could test this hypothesis. Finally, although this sample was fairly diverse, many groups were underrepresented. For example, the only meaningful comparisons across ethnicity that we could make were between white and African American participants; other ethnic minorities should be considered. In addition, the percent of sexual minorities in this sample is unknown and is presumed to be relatively small. Future research could address how discrimination contributes to health in more diverse samples.

Despite these limitations, the present research suggests that discrimination based on a number of personal characteristics is associated with declines in physical and mental health in older adulthood. This research suggests that the effects of discrimination are not limited to the young; older adults are vulnerable to its harmful effects. In older adulthood, discrimination based on age and other personal characteristics that change with age may have particularly adverse consequences on health and well-being.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Descriptive Statistics at Baseline and Follow-up

	Baseline	Follow-up
Discrimination		
Race	10.0	7.6
Ancestry	6.5	4.7
Sex	13.0	9.9
Age	30.1	28.4
Weight	8.0	9.2
Physical disability	7.1	7.5
Appearance	6.0	8.3
Sexual orientation	1.7	1.6
Physical Health		
Self-rated health	2.70 (1.07)	2.84 (1.07)
Disease burden	1.84 (1.29)	2.19 (1.36)
Emotional Health		
Life Satisfaction	4.40 (1.21)	4.96 (1.52)
Loneliness	1.48 (.54)	1.46 (.53)
Cognitive Health		
Memory	10.10 (3.26)	9.55 (3.39)
Mental Status	12.91 (2.33)	12.35 (2.56)

Note. *N*=7,622. Percentages and means (standard deviations).

Table 2

Regression Analysis Predicting Self-rated Health and Disease Burden from Covariates and Discrimination

	Self-rated Health (poor)			Disease Burden		
	Baseline	**Follow up**	**Change**	**Baseline**	**Follow up**	**Change**
Demographic covariates						
Age	.10*	.09*	.06*	.35*	.28*	.03*
Age squared	.02	.03	.02	−.10*	−.10*	−.03*
Sex	−.01	−.02	−.02	.02	.00	−.03*
Ethnicity (Black)	.10*	.10*	.03*	.08*	.08*	.00
Ethnicity (Other)	.00	.02	.02	.00	.00	.00
Education	−.29*	−.25*	−.06*	−.11*	−.12*	−.02*
Discrimination based on						
Race	.02	.02	.00	.02	.03	.01
Ancestry	.02	.02	.01	.00	.02	.02
Sex	−.03*	−.01	.00	−.01	−.02	−.01
Age	.05*	.08*	.04*	.05*	.09*	.03*
Weight	.14*	.14*	.06*	.14*	.15*	.04*a
Physical disability	.23*	.19*	.05*	.15*	.16*	.03*
Appearance	.05*	.04*a	.01	.04*	.04*	.00
Sexual orientation	.01	.01	.00	.01	.00	−.01

Note. Standardized beta coefficients from linear regression analyses controlling for age, age squared, sex, ethnicity, and education. See Supplemental Table 1 for *t*-value for each coefficient. For self-rated health, *n*=7,614 at baseline (*df*=7606) and *n*=6,445 (*df*=6437) at follow-up. For disease burden, *n*=7,184 (*df*=7176) at baseline and *n*=6,051 (*df*=6043) at follow-up.

*p < .01.

a Reduced to non-significance when controlling for body mass index and smoking.

Table 3

Regression Analysis Predicting Life Satisfaction and Loneliness from Covariates and Discrimination

	Life Satisfaction			Loneliness		
	Baseline	**Follow up**	**Change**	**Baseline**	**Follow up**	**Change**
Demographic covariates						
Age	.14[*]	.08[*]	.01	−.11[*]	−.06[*]	.01
Age squared	−.06[*]	−.06[*]	−.04[*]	.08[*]	.11[*]	.07[*]
Sex	−.01	.01	.02	.05[*]	.06[*]	.04[*]
Ethnicity (Black)	−.09[*]	−.10[*]	−.05[*]	.05[*]	.06[*]	.02
Ethnicity (Other)	.00	.00	.02	.00	.01	−.01
Education	.11[*]	.13[*]	−.07[*]	−.12[*]	−.10[*]	−.04[*]
Discrimination based on						
Race	−.04[*]	−.03	.00	.07[*]	.05[*]	−.01
Ancestry	−.02	−.02	−.01	.09[*]	.04[*]	.00
Sex	−.01	.00	.00	.04[*]	.05[*]	.02
Age	−.11[*]	−.10[*]	−.05[*]	.18[*]	.15[*]	.05[*]
Weight	−.11[*]	−.12[*]	−.06[*]	.14[*]	.13[*]	.04[*]
Physical disability	−.17[*]	−.14[*]	−.08[*]	.18[*]	.16[*]	.06[*]
Appearance	−.10[*]	−.10[*]	−.04[*]	.14[*]	.11[*]	.03[*]
Sexual orientation	−.01	−.01	−.01	.04[*]	.02	.00

Note. Standardized beta coefficients from linear regression analyses controlling for age, age squared, sex, ethnicity, and education. See Supplemental Table 2 for *t*-value for each coefficient. For life satisfaction, n=7,554 (df=7546) at baseline and n=5,507 (df=5499) at follow-up. For loneliness, n=7,547 (df=7539) at baseline and n=5,512 (df=5509) at follow-up.

[*] p < .01.

Table 4

Regression Analysis Predicting Memory and Mental Status from Covariates and Discrimination

	Memory			Mental Status		
	Baseline	**Follow up**	**Change**	**Baseline**	**Follow up**	**Change**
Demographic covariates						
Age	−.34[*]	−.35[*]	−.23[*]	−.05[*]	−.12[*]	−.12[*]
Age squared	−.10[*]	−.10[*]	−.07[*]	−.10[*]	−.09[*]	−.05
Sex	.14[*]	.17[*]	.10[*]	−.05[*]	.07[*]	−.03
Ethnicity (Black)	−.12[*]	−.11[*]	−.04[*]	−.20[*]	−.22[*]	−.09[*]
Ethnicity (Other)	−.06[*]	−.04[*]	.00	−.05[*]	−.03	.00
Education	.30[*]	.32[*]	.18[*]	.38[*]	.36[*]	.16[*]
Discrimination based on						
Race	−.04[*]	.00	.01	.01	−.01	−.01
Ancestry	−.02	.00	.01	.01	.00	.00
Sex	.03[*]	.02	.00	.06[*]	.04[*]	.00
Age	.00	.01	.02	.04[*]	.01	.00
Weight	−.01	.00	.01	−.02	−.02	−.01
Physical disability	−.08[*]	−.07[*]	−.04[*]	−.06[*]	−.05[*]	−.02
Appearance	−.01	−.01	−.01	.01	.01	.03
Sexual orientation	−.01	−.03[*]	−.02	.00	.00	.00

Note. Standardized beta coefficients from linear regression analyses controlling for age, age squared, sex, ethnicity, and education. See Supplemental Table 3 for *t*-value for each coefficient. For memory, *n*=7,507 (*df*=7499) at baseline and *n*=6,091 (*df*=6083) at follow-up. For mental status, *n*=4,593 (*df*=4585) at baseline and *n*=4,234 (*df*=4226) at follow-up.

[*] p < .01.