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Perceived Discrimination Trajectories and Depressive Symptoms Among Middle-Aged and Older Black Adults

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Abstract

Background and Objectives: Perceived discrimination is a risk factor for poor mental health. However, most studies measure discrimination at one time point, which does not account for heterogeneity in the cumulative patterning of exposure to discrimination. To address this gap, we examine the association between discrimination trajectories and depressive symptoms among black middle-aged and older adults.

Research Design and Methods: Data were analyzed from a subsample of black Health and Retirement Study respondents (2006–2018, $N = 2926$, older than 50 years). General discrimination and racial discrimination trajectories were constructed based on the Everyday Discrimination Scale using repeated measures latent profile analyses. We examined the extent to which the association between discrimination trajectories are differentially associated with depressive symptoms (8-item Center for Epidemiological Studies-Depression scale) using negative binomial regression models adjusted for potential confounders. Effect modification by age and gender was tested.

Results: Individuals in the persistently high (incident rate ratio [IRR]: 1.70; 95% confidence interval [CI]: 1.49–1.95) and moderate general discrimination trajectories (IRR: 1.19; 95% CI: 1.06–1.33) were more likely to have elevated depressive symptoms in comparison to those in the persistently low trajectory. This relationship was strongest among older adults aged older than 65 years. Respondents in the persistently high racial discrimination trajectory (IRR: 1.50; 95% CI: 1.29–1.73) had a higher risk of elevated depressive symptoms in comparison to respondents in the persistently low trajectory. Sensitivity analyses indicated that there was an independent association between persistently high racial discrimination trajectory class and elevated depressive symptoms, after adjusting for racial discrimination measured at a single time point.

Discussion and Implications: Characterizing longitudinal patterns of perceived discrimination may facilitate the stratification of mental health risk and vulnerability among black middle-aged and older adults. Trajectories of racial discrimination may inform risk of worse depressive symptoms more accurately than a single assessment of discrimination.

Translational Significance: This project has relevance for research and clinical settings and presents an opportunity to improve the measurement of perceived discrimination in the aging process. Characterizing perceived discrimination trajectories allows for greater precision in estimating mental health vulnerability and may inform the design of culturally relevant interventions to improve mental health among middle-aged and older black adults.

Keywords: Cumulative inequality, Life course perspective, Mental health, Minority aging, Race/ethnicity, Racial discrimination

Background and Objectives

Mental health plays a critical role in the well-being, independence, and health of middle-aged and older adults. Poor mental health, particularly psychological distress and depression, is associated with higher health care costs, reduced quality of life, increased risk of disability and morbidity, greater hospitalizations, and higher rates of mortality (1–5). The prevalence of depressive symptoms among community-dwelling adults aged older than 50 years varies by race/ethnicity, with middle-aged and older black adults generally reporting higher depressive symptoms in comparison to their white counterparts (6,7). Reported estimates for clinically significant depressive symptoms among middle-aged and older black adults range from 5.4% to 27.6% among community samples (6,8). Despite the greater burden of depressive symptoms among middle-aged and older black adults, evidence suggests that their mental health needs are not adequately met and are more likely to be underestimated, underdiagnosed, and undertreated in comparison to their white counterparts (6,9). Understanding and addressing the role of exposure to psychosocial stressors, such as perceived discrimination, is a critical step to addressing the mental health needs of middle-aged and older black adults.

Several reviews and numerous studies provide compelling evidence showing that perceived discrimination adversely affects mental health (10–17). Findings from studies illustrate that reporting high levels of racial and nonracial forms of perceived discrimination is associated with elevated depressive symptoms (18–21). Perceived discrimination, subjective perceptions of unfair or unjust treatment based on personal characteristics (e.g., race/ethnicity, age, sex, weight, sexual orientation, and other characteristics) (22), is more frequently reported by African Americans, regardless of attribution (23–26). There is a growing body of research showing substantive heterogeneity in the experiences of perceived discrimination among blacks by gender and age (19,27–30). A recent literature review documented gender differences in the impact of discrimination on mental health among blacks (27). For example, Mouzon et al. (31) showed that older African American men were more likely to belong to the high discrimination typology group in comparison to older African American women. There is evidence to suggest age differences in exposure and impact of discrimination on mental health. In comparison to younger and middle-aged adults, older blacks may have a unique historical and social circumstances that make them more vulnerable to stress resulting from discrimination due to growing up when discrimination was legally sanctioned and greater accumulation of stress over the life course (32). Furthermore, research has documented U-shaped curves over age for depressive symptoms, where

depressive symptoms are highest in young adulthood, decrease during middle age, and increase again in older adulthood (33,34). Our understanding of gender and age differences in exposure to discrimination and the subsequent impact on mental health is incomplete and warrants further investigation.

More recent studies have identified perceived discrimination typologies that characterize patterns in the level and intensity of exposure to discrimination (31,35,36). One study, which used data from African Americans aged 55 and older from the National Survey of American Life, identified three discrimination typologies, including low, moderate, and high levels of discrimination (31). Whereas studies of perceived discrimination typologies, which are constructed at a single time point, illuminate important heterogeneity in discriminatory experiences, characterizing longitudinal profiles of repeated exposure to chronic discrimination across domains and multiple time points warrants further investigation.

A longitudinal approach, drawing from life course, cumulative inequality, stress accumulation, and intersectionality theories (37–39), may deepen our understanding of the accumulated experiences of discrimination over time and its impact on health. Perceived discrimination trajectories that capture changes in the dynamic nature and intensity of repeated exposures to discrimination over time may result in distinct exposure profiles. Until recently, research on perceived discrimination trajectories and mental health was concentrated mainly among adolescents and emerging adults (30,40–42), with limited studies among middle-aged and older adults (43,44). In a study of African American early adults (aged 18–21), three perceived discrimination trajectories (i.e., high-stable, low-increasing, and low-decreasing) were identified (41). African American men in the high-stable perceived discrimination trajectory reported more alcohol use than men in other trajectories (41). More importantly, findings from these studies have shown that membership in perceived discrimination trajectories is associated with unique health profiles (30,40–42). However, there is a dearth of studies that have constructed a cumulative measure of perceived discrimination among black middle-aged and older adults and examined whether it predicts variability in health.

The extent to which a longitudinal relationship between cumulative exposure and racial discrimination shapes mental health among adults has been examined in a limited number of studies (43–45). One study, using a population of ethnically diverse adults from the United Kingdom, demonstrated that mental health scores were lower among individuals who reported racial discrimination at two different time points in comparison to individuals who either reported discrimination at only one time point or no

discrimination (45). In another study conducted among a diverse sample of older women, four perceived discrimination trajectories were characterized (43). The findings showed that membership in the trajectory that reported the greatest cumulative perceived interpersonal discrimination had the highest risk of depression compared with women in the other trajectories (43). These studies produced empirical evidence furthering our understanding of the dynamic nature of discrimination and mental health. Yet, there is still an absence of research examining heterogeneity in the cumulative patterning of exposure to discrimination among black middle-aged and older adults and its impact on mental health.

To address this gap, we characterize perceived general discrimination and perceived racial discrimination trajectories and examine whether the trajectories are associated with depressive symptoms. It was hypothesized that individuals in the most deleterious perceived discrimination trajectories (e.g., persistently high) would have the highest levels of depressive symptoms in comparison to those in the less deleterious perceived discrimination trajectories (e.g., persistently low). We also investigated whether the association between perceived discrimination trajectories and depressive symptoms differed by gender and age. Additionally, we examined whether perceived discrimination trajectories provide information regarding the risk of elevated depressive symptoms beyond that captured by a one-time assessment of perceived discrimination.

Research Design and Methods

Data

The Health and Retirement Study (HRS) is a longitudinal, biennial interview survey of a nationally representative sample of noninstitutionalized U.S. adults aged 50 and older. Detailed descriptions of sampling procedures and study design are available elsewhere (46). Briefly, HRS, which was initiated in 1992, employs a multistage area probability design with geographic stratification and clustering. The original response rate was 81.4% and response rates for subsequent waves range between 85% and 90% (47). Blacks and Hispanics are oversampled with response rates and longitudinal follow-up comparable to or better than whites (48). Participants are interviewed biennially in several domains including health, psychosocial factors, health care expenditures, and service utilization. The RAND version of the HRS public data, a user-friendly version, was utilized for the core data variables (49).

Data were analyzed from the 2006–2018 waves. The Leave-Behind Questionnaire (LBQ), which began in 2006, is completed by a rotating random sample of HRS participants who completed the in-person interview during that wave. Thus, participants complete the LBQ every

4 years, with the two subsamples alternating years (50). LBQ response rates range from 72.7% to 87.7% (50). The analysis is limited to respondents who self-identify as non-Hispanic black and are aged older than 50 years ($n = 3855$). The following exclusion criteria were applied: completely missing or invalid Everyday Discrimination Scale (EDS) questions for all years ($n = 180$), missing or invalid Center for Epidemiological Studies-Depression scale (CES-D) score ($n = 717$), and missing or invalid data for controls ($n = 32$). The final analytic sample yielded 2926 participants.

Measures

Perceived discrimination

Perceived discrimination was measured using the EDS, which was designed to capture chronic forms of mistreatment across several domains (22). The EDS has been shown to exhibit high internal consistency and validity in comparable populations (51,52). Participants were asked how often they experienced: treatment with less courtesy or respect than other people, received poorer service than other people at restaurants or stores, people act as if they think you are not smart, people act as if they are afraid of you, and you are threatened or harassed. Responses were scored on a six-point scale (1 = almost every day, 6 = never). Items were reverse-coded and a continuous EDS score was created by summing the scores across the items. If the respondent reported discrimination, a follow-up question about attribution (e.g., ancestry or national origin; gender; race, age, religion; weight, physical disability, other aspect of physical appearance, sexual orientation, financial status, or other) of the unfair treatment was asked. Study respondents may face discrimination across multiple identities in addition to race. Therefore, participant attribution responses were used to create perceived general discrimination (attributed to any category, including race) and perceived racial (attributed to race, ancestry or national origin only) discrimination scores.

Repeated measures latent profile analyses (RMLPAs) were conducted using Mplus 7 software to examine patterns of perceived general and racial discrimination (53). Unlike traditional longitudinal modeling procedures such as growth curve analysis, which is a variable-centered procedure, latent profile analysis is a person-centered procedure (54). The methods differ in the types of questions they answer. For example, person-centered approaches identify patterns of change over time among groups of people that share similar attributes on a set of variables, whereas variable-centered approaches (e.g., general estimating equations and mixed-effects regression models) describe associations between sets of variables. In our case, we used RMLPA because we had longitudinal data and wanted to identify subpopulations, or trajectories, of people who shared similar discrimination experiences. Three distinct trajectories of perceived

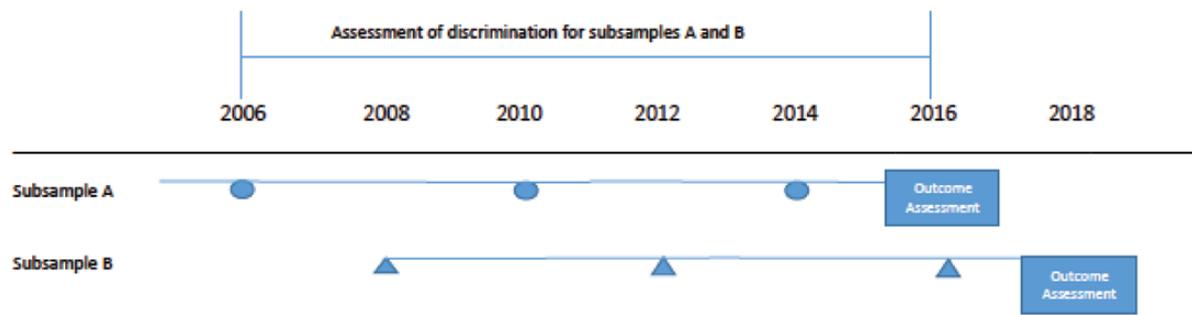


Figure 1. Study design timeline of analysis. The timeline was used to investigate the association between perceived discrimination trajectories from 2006 to 2016 in two subsamples of black middle-aged and older adult Health and Retirement Study respondents. Depressive symptoms were measured at the next wave after the final assessment of perceived discrimination trajectories.

Table 1. Indices of Fit for Perceived General Discrimination and Racial Discrimination Identified in Repeated Measures Latent Profile Analyses ($N = 2926$)

Model (No. of Trajectories)	Log Likelihood	Best H0 Replicated (Yes/No)	No. of Parameters	AIC	BIC	SSABIC	LMR-LRT (p)	Entropy
General discrimination models								
1	-19,024.84	Yes	6	38,062	38,099	38,080	—	—
2	-18,263.30	Yes	10	36,547	36,609	36,577	<.0001	0.819
3	-18,072.88	Yes	14	36,174	36,261	36,216	.0053	0.767
4	-17,919.43	Yes	18	35,875	35,987	35,930	.0724	0.765
Racial discrimination models								
1	-8,585.11	Yes	6	17,182	17,216	17,197	—	—
2	-8,347.41	Yes	10	16,715	16,771	16,739	<.0001	0.804
3*	-8,298.95	Yes	14	16,626	16,705	16,660	.0243	0.791

Note: AIC = Akaike information criterion; BIC = Bayesian information criterion; SSABIC = sample size adjusted BIC; LMR-LRT = Vuong-Lo-Mendall-Rubin likelihood ratio test, comparing the current model with a model with one less latent profile.

*Although the LMR-LRT for the three-class solution did not confirm that a two-class solution was the best-fitting model, the third class only contained 2% of the sample; thus, it was not a reliable or meaningful class.

general discrimination and two distinct trajectories of perceived racial discrimination were assessed from 2006 to 2016 and identified in the RMLPA (Figure 1). The model results and trajectory characteristics are given in Table 1. The decision criteria were generally in agreement regarding the best model fit. For perceived general discrimination, three trajectories were identified: trajectory 1 (“low”) was characterized by consistently low levels of reported general discrimination; trajectory 2 (“moderate”), reflecting moderate levels of general discrimination; and trajectory 3 (“persistently high”), consisting of the highest and persistent levels of perceived general discrimination across time. For perceived racial discrimination, two trajectories were identified: trajectory 1 (“low to moderate”), with consistently low and increasing experiences of perceived racial discrimination; and trajectory 2 (“persistently high”) characterized by persistently high racial discriminatory experiences across time. After estimating the RMLPA, we exported the data to be included in the regression models, where we used low perceived general discrimination and low perceived racial discrimination as the reference groups for the two measures of perceived discrimination trajectories.

Depressive symptoms

Depressive symptoms were assessed using the eight-item version of the CES-D. The CES-D is widely used and has demonstrated good psychometric properties (e.g., Cronbach’s alpha = 0.81–0.83) among middle-aged and older adults (55). Items asked if the following symptoms were experienced in the prior week: felt depressed, felt that everything I did was an effort, my sleep was restless, could not get going, felt lonely, enjoyed life, felt sad, and was happy. Positive items were reverse-coded and higher scores reflected more depressive symptoms. Depressive symptoms were modeled as a continuous variable and measured at the wave following the construction of the perceived discrimination trajectories (Figure 1).

Covariates

Variables that may confound the association between perceived discrimination and depressive symptoms were adjusted in the analytical models. Sociodemographic variables included age (50–64 and ≥ 65), gender (male and female), educational attainment (less than high school [HS], HS or equivalent, some college, college graduate, and more), and foreign-born status (U.S.-born and foreign-born) were

measured at baseline. The following covariates were measured at the end of the perceived discrimination trajectory assessment period: marital status (never married, married/partnered, divorced/separated/widowed), health insurance status (yes, no), household wealth, labor force participation status (retired, working, disabled, and unemployed), and number of chronic conditions (range 0–8, including high blood pressure, cancer, lung disease, heart disease, stroke, arthritis, diabetes, and psychiatric conditions).

Statistical Analysis

Means and frequencies were calculated for sociodemographic characteristics of the sample population by perceived discrimination trajectory membership. Generalized linear models with a negative binomial distribution, which provides relative risks and confidence intervals (CIs), were employed to estimate the association between perceived discrimination trajectories and depressive symptoms. Models were built sequentially with Model 1 (minimally adjusted): adjusted for age and gender; Model 2 (fully adjusted): Model 1 and additional adjustment for educational attainment, foreign-born status, marital status, health insurance status, household wealth, labor force participation status, and number of chronic conditions. To determine whether the discrimination trajectories and depressive symptom association differed across levels of age and gender, in separate fully adjusted models, interaction terms between each perceived discrimination trajectory and age and gender were tested. Due to the ease of interpreting the main effect of perceived discrimination trajectories in the subgroups, we chose to stratify the models by age and gender. The adjustment set of age- and gender-stratified estimates includes all of the variables from Model 2. In sensitivity analyses, we investigated whether perceived discrimination trajectories were associated with depressive symptoms above and beyond the effect of discrimination captured by a one-time assessment. To determine whether the perceived discrimination trajectories were more informative than an individuals' baseline perceived discrimination score, we additionally adjusted Model 2 for the baseline perceived discrimination score. Data management and analyses were conducted in STATA 16 (Stata Statistical Software, Release 16; StataCorp LP, College Station, TX) (56) and weighted to account for the complex sampling design.

Results

Descriptive characteristics of the analytic sample are presented by perceived general and racial discrimination trajectories in Table 2. For perceived general discrimination, trajectory 1 (“persistently low”) represented 73.2% of the sample, trajectory 2 (“moderate”) contained 21.3% of respondents, and trajectory 3 (“persistently high”) had 5.6% of the population. For perceived racial

discrimination, two distinct trajectories were identified: trajectory 1 (“low to moderate”) which comprised 87.7% of the sample and trajectory 2 (“persistently high”) with 12.3% of respondents. Gender, educational attainment, marital status, household wealth, labor force participation status, health insurance status, and number of chronic conditions differed across both perceived general and racial discrimination trajectories. Women, those without HS diplomas, not partnered, lower household wealth, and more chronic conditions were overrepresented in the persistently high perceived general discrimination trajectory. The highest proportion of individuals without an HS diploma, single, and disabled was overrepresented in the high perceived racial discrimination trajectory in comparison to the low to moderate perceived racial discrimination trajectory. The distribution of middle-aged and older adults and those who were foreign-born was relatively similar across perceived general and racial discrimination trajectories.

Results of the regression models are summarized in Table 3 (detailed estimates for all covariates given in Supplementary Table 1). In the minimally adjusted model, trajectories of higher perceived general discrimination were significantly associated with worse depressive symptoms. After adjustment, results were attenuated, with those in the persistently high trajectory (incident rate ratio [IRR]: 1.70; 95% CI: 1.49–1.95) and those in the trajectory representing moderate (IRR: 1.19; 95% CI: 1.06–1.33) levels of accumulated perceived general discrimination, were more likely to have elevated depressive symptoms in comparison to those in low discrimination trajectory. Parallel results were observed for trajectories of perceived racial discrimination. Respondents in the persistently high racial discrimination trajectory were associated with elevated depressive symptoms (IRR: 1.50; 95% CI: 1.29–1.73) in comparison to respondents in low to moderate perceived racial discriminatory trajectory, after adjustment for covariates.

Gender- and age-stratified analyses for the perceived general and racial discrimination trajectories are presented (Table 4, with detailed estimates for all covariates given in Supplementary Tables 2 and 3). In adjusted analyses, the most pronounced risk for elevated depressive symptoms was observed among respondents aged 65 and older in the persistently high perceived discrimination trajectory class (IRR: 1.97; 95% CI: 1.67–2.28). An elevated risk of depressive symptoms was observed among individuals aged 65 and older in the moderate perceived general discrimination trajectory (IRR: 1.21; 95% CI: 1.03–1.39). Among individuals aged 50–64, the risk for elevated depressive symptoms was highest among those in the persistently high trajectory (IRR: 1.41; 95% CI: 1.12–1.79). A gradient was observed among men in the persistently high perceived general discrimination (IRR: 1.83; 95% CI: 1.48–2.28) and the moderate perceived general discrimination trajectory class (IRR: 1.26; 95% CI: 1.05–1.51). Women in the persistently high perceived general discrimination trajectory class had a higher risk of elevated depressive symptoms

Table 2. Sociodemographic Characteristics of Black Middle-Aged and Older Adults by Perceived General Discrimination and Perceived Racial Discrimination Trajectories, Health and Retirement Study, 2006–2016

	General Discrimination Trajectory, <i>N</i> = 2926				Racial Discrimination Trajectory, <i>n</i> = 1,676	
	Total Sample, <i>N</i> = 2926	Low, <i>n</i> = 2,141	Moderate, <i>n</i> = 622	Persistently High, <i>n</i> = 163	Low to Moderate, <i>n</i> = 1,470	Persistently High, <i>n</i> = 206
	%	%	%	%	%	%
Age (years)						
50–64	35.5	32.3	42.8	49.1	35.8	46.6
≥65	64.5	67.7	57.2	50.9	64.2	53.4
Gender						
Male	35.1	32.9	41.0	41.1	36.1	46.6
Female	64.9	67.1	59.0	58.9	64.0	53.4
Education						
<HS	23.8	23.2	23.3	32.5	17.6	31.1
HS grad or GED	32.3	32.2	33.3	32.6	31.8	31.5
Some college	28.1	28.9	26.7	22.7	31.0	21.8
College or more	15.8	15.7	16.7	12.2	19.6	15.5
Marital status						
Never married	11.0	9.1	14.6	22.2	9.4	20.4
Married/partnered	43.0	44.1	41.6	34.0	44.9	39.8
Divorced/separated/ widowed	46.0	46.8	43.7	43.8	45.7	39.8
Household wealth (mean, <i>SD</i>)	124,314.5 (7,656.9)	133,292.4 (9,581.3)	111,182.8 (13,063.5)	56,500.3 (8,380.6)	139,109.9 (9,971.9)	93 643 (16 524.0)
Labor force participation						
Retired	53.8	56.0	48.2	45.4	52.7	48.5
Working	32.3	31.7	35.7	27.0	36.0	30.1
Disabled	8.7	7.1	10.5	22.7	6.1	17.5
Unemployed	5.3	5.2	5.6	4.9	5.2	3.9
Health insurance						
Yes	92.4	93.1	91.0	88.3	92.9	91.8
No	7.62	6.9	9.0	11.7	7.1	8.3
No. of chronic conditions (mean, <i>SD</i>)	2.54 (0.03)	2.48 (0.03)	2.65 (0.05)	2.95 (0.16)	2.52 (0.04)	2.76 (0.12)
Foreign-born						
No	92.7	92.3	93.4	93.9	93.8	92.2
Yes	7.4	7.7	6.6	6.1	6.2	7.8
Baseline CES-D score (mean, <i>SD</i>)	1.75 (0.46)	1.56 (0.04)	2.00 (0.12)	3.26 (0.18)	1.64 (0.07)	2.78 (0.17)

Notes: CES-D = Center for Epidemiological Studies-Depression scale; GED = general equivalence degree; HS = high school; SD = standard deviation. Frequencies presented are unweighted.

(IRR: 1.65; 95% CI: 1.34–2.01) in comparison to women in the lowest perceived general discrimination trajectory class. There were no interactions identified between perceived general discrimination trajectory and gender or between the perceived racial discrimination trajectory age and gender ($p \geq .10$, given in Table 4).

Sensitivity analyses examined whether perceived discrimination trajectories were associated with depressive symptoms above and beyond perceived discrimination at one time point. For perceived general discrimination, after additionally adjusting for the baseline perceived

discrimination, neither the persistently high perceived general discrimination trajectory (IRR: 1.29; 95% CI: 0.99–1.69) nor moderate perceived general discrimination trajectory (IRR: 1.04; 95% CI: 0.89–1.22) reached statistical significance. The association between the baseline perceived discrimination score and depressive symptoms included the null (IRR: 1.02; 95% CI: 1.00–1.04). A slightly different pattern emerged when examining perceived racial discrimination. The persistently high racial discrimination trajectory remained significantly associated with depressive symptoms (IRR: 1.27; 95% CI: 1.01–1.59) and the

baseline perceived discrimination included the null (IRR: 1.02; 95% CI: 1.00–1.04).

Discussion and Implications

This study examined how cumulative exposure to perceived general and racial discrimination influenced depressive symptoms among black middle-aged and older adults. The latent classes identified in this analysis suggest that middle-aged and older black adults experience distinct patterns of perceived discrimination that are significantly associated with depressive symptoms. More specifically, we observed that those with patterns of moderate and high levels of perceived general discrimination and those with patterns of high racial discrimination were more likely to have elevated

depressive symptoms than those with consistently low perceived general discrimination or racial discrimination across an 8-year study period. These relationships were strongest among older adults (≥65) and men.

The present results are consistent with an emerging body of literature demonstrating the dynamic nature and heterogeneity in exposure to discrimination among middle-aged and older black adults. We identified unique clusters of individuals who have similar response patterns regarding their lived experience and exposure to discrimination across time. Two types of perceived discrimination trajectories were identified according to their longitudinal patterns across domains and time: general discrimination (low, moderate, and persistently high) and racial discrimination (low to moderate and persistently high). Black adults may experience multiple forms of discrimination that can be attributed to simultaneously occupying other social identities, such as age, gender, or sexual identity, that overlap with race. The perceived general discrimination trajectories, which are inclusive of racial and nonracial forms of discrimination, were more strongly associated with elevated depressive symptoms in comparison to the perceived racial discrimination trajectories. These findings highlight the significance of integrating an intersectionality framework to further understand exposure to, experiences of, and the physical and mental health sequelae of discrimination (57). An intersectionality approach highlights the ways in which multiple social identities (e.g., race, gender, sexual orientation, and socioeconomic status) interact and mutually constitute one’s experience (37,38). Prior research on discrimination and health largely takes into account the aggrieved experience of a single social identity, namely, race/ethnicity for blacks. While racial discrimination is a unique persistent and chronic stressor of the lived experiences of blacks in the United States, a singular focus may ultimately underestimate the overall impact of

Table 3. Association Between Perceived Discrimination Trajectories and Depressive Symptoms Among Black Middle-Aged and Older Adults, Health and Retirement Study, 2006–2018

Trajectory	Model 1*		Model 2†	
	IRR	95% CI	IRR	95% CI
Perceived general discrimination				
Low	Ref		Ref	
Moderate	1.29	1.16–1.43	1.19	1.06–1.33
Persistently high	2.10	1.84–2.40	1.70	1.49–1.95
Racial discrimination				
Low to moderate	Ref		Ref	
Persistently high	1.71	1.49–1.97	1.50	1.29–1.73

Note: CI = confidence interval; IRR = incident rate ratio.

*Model 1 adjusts for age and gender.

†Model 2 adjusts for Model 1 and educational attainment, foreign-born status, marital status, health insurance, household wealth, labor force participation status, and number of chronic conditions.

Table 4. Associations Between Perceived Discrimination Trajectories and Depressive Symptoms Among Black Middle-Aged and Older Adults Stratified by Age and Gender, Health and Retirement Study, 2006–2018

	Age*					Interaction <i>p</i> Value†	Gender*				
	50–64		≥65		Interaction <i>p</i> Value†		Male		Female		Interaction <i>p</i> Value†
	IRR	95% CI	IRR	95% CI			IRR	95% CI	IRR	95% CI	
Perceived general discrimination											
Low	Ref		Ref			Ref		Ref			
Moderate	1.15	1.00–1.32	1.21	1.03–1.39	.616	1.26	1.05–1.51	1.15	1.00–1.32	.373	
Persistently high	1.41	1.12–1.79	1.97	1.67–2.28	.027	1.83	1.48–2.27	1.65	1.34–2.01	.394	
Perceived racial discrimination											
Low to moderate	Ref		Ref			Ref		Ref			
Persistently high	1.45	1.15–1.83	1.50	1.27–1.77	.952	1.42	1.17–1.72	1.53	1.22–1.91	.976	

Note: CI = confidence interval; IRR = incident rate ratio.

*Model adjusts for age, gender, educational attainment, foreign-born status, marital status, health insurance, household wealth, labor force participation, and number of chronic conditions.

†Testing the discrimination trajectory and age interaction using the full model.

‡Testing the discrimination trajectory and gender interaction using the full model.

discrimination on health given multiple systems of oppression. Cumulative measures of perceived discrimination that capture attribution due to both racial and nonracial social identities may have a synergistic effect on health, yet research exploring this deserves further attention.

This study contributes to the limited literature on perceived discrimination trajectories and mental health. In our study, both perceived general and racial discrimination trajectories were useful in further stratifying black middle-aged and older adults at risk for elevated depressive symptoms. In general, we found a gradient in the relationship between perceived general discrimination and elevated depressive symptoms, with those in the persistently high perceived discrimination trajectory class experiencing a higher risk of depressive symptoms than those in the moderate perceived general discrimination trajectory. Despite differences in study populations, our results are largely consistent with prior work. In a diverse sample of adults from the United Kingdom, Wallace et al. (45) found a dose-response relationship between cumulative racial discrimination and worse depressive symptoms. Bécarea and Zhang (43) used data from a multiethnic population of older women and observed that those who experienced the highest levels of cumulative perceived interpersonal discrimination had the highest risk of depression in comparison to women reporting minimal cumulative or no discrimination. The findings were robust across African Americans, Chinese Americans, Japanese Americans, and non-Hispanic whites. Building upon the results from prior work examining these associations in more diverse and multiethnic populations, our study provides further evidence of the cumulative effects of discrimination by focusing on within-group variability of experiences of mistreatment and the mental health of U.S. black middle-aged and older adults. Greater insight into the broader complexities of the cumulative lived experience of black Americans is needed to inform the development of trauma-based care interventions.

Results of the stratified analyses for the association between perceived general discrimination trajectories and age revealed that individuals aged 65 and older had a stronger association with elevated depressive symptoms in comparison to those 50–64 years of age. The more pronounced association we have observed among older adults, in comparison to middle-aged adults, may be a function of capturing the cumulative experiences of overall mistreatment. It is also possible that the help-seeking behaviors for mental health may vary by age. For example, one study found that younger blacks were more likely to rely on informal supports for mental health (58). Furthermore, many of the prior studies only measured discrimination at a single point in time and it is possible that the health impact of perceived discrimination, which has been shown to be cumulative, may be underestimated with just a single measure.

While our analysis revealed that women were more likely to be included in the persistently high general discrimination and racial discrimination trajectories, the relationship

between either perceived discrimination trajectory and depressive symptoms did not vary significantly by gender. This finding contrasts with prior literature indicating a moderating role between individual-level discrimination and mental health (27,59). One study found gender differences in the type of discrimination experienced, where black women may be more likely to experience greater exposure to individual-level discrimination and black men encountered greater levels of structural discrimination (59). In our measure of perceived discrimination trajectories, neither accounted for structural indicators of discrimination. There is growing interest in the gendered norms that shape the type and setting of encountering discrimination as well as the adaptive resources, coping strategies, and styles experienced by black women and men. While these gendered differences may influence the qualitative and experiential nature of discrimination, the shared sociocultural context leads to similar vulnerability to an increased risk of poorer mental health (27).

A cross-sectional measurement of perceived discrimination may not provide the most accurate representation of its consequences on health and may in fact be an underestimation of its impact on health (60,61). It has been postulated that frequent and repeated experiences of discrimination over time may be more strongly correlated with health outcomes compared with a single report in time (43,45,60). Our results provide moderate evidence in support of perceived discrimination trajectories more accurately reflecting the burden of discrimination than a one-time assessment of perceived discrimination. The connections between perceived discrimination trajectories and the development and progression of physical health conditions (e.g., multimorbidity) have largely gone unaddressed. Whereas there are some important gaps and challenges with measuring and studying perceived discrimination in a longitudinal context, it is possible that perceived discrimination trajectories may provide mechanistic clues related to racial/ethnic differences in accelerated biological aging.

In light of our results, several limitations should be noted. First, the measurement of perceived discrimination. Weaknesses to measuring perceived discrimination using EDS, currently the most widely used scale, are well described and include the lack of vicarious exposures to discrimination, all possible places and instances in which discrimination can be experienced, and subjective appraisal of the experience (13,32,43,62). Likewise, the discrimination trajectories did not include major lifetime discrimination, which typically captures discrete incidents of mistreatment such as denied getting a job or home loan. Measures of major lifetime discrimination may not occur as frequently as the EDS measures. Although major life experiences of discrimination can also have a detrimental impact on mental health, it has been shown that the EDS is more strongly associated with health outcomes in comparison to the major lifetime discrimination scale (22,23,63). To characterize

trajectories, EDS measurements that were captured three times over an 8-year time period and did not reference a specific time frame associated with when the actual discriminatory event occurred, although we measure it every 4 years. Furthermore, we do not capture perceived discrimination prior to the 2006 interview (i.e., during childhood, adolescence, or young and earlier adulthood). Although exposure to perceived discrimination during other life stages may be important to shaping mental health status, the specific critical and sensitive periods during which such exposures are the most deleterious are not well understood. To the best of our knowledge, there are no measures of discrimination that have been specifically developed with an aging lens that accounts for the developmental, psychosocial, and social circumstances of older adults (32).

Second, we did not account for appraisal of perceived discrimination, coping strategies, or resources that may mitigate the negative impact of discrimination. Previous studies have found that racial socialization and strong racial identity may buffer against the negative impact of discrimination on mental health (64). However, this was not captured in the HRS and warrants further exploration in future studies. Third, this study was not able to assess whether there were differences among black Americans by ethnicity. In our sample, 7.4% of participants were foreign-born blacks and we were unable to, with sufficient power, examine whether there were differences in the characterization of perceived discrimination trajectories. We did not include an indicator for psychological and/or pharmacological treatment for depression. While black middle-aged and older adults are more likely to be undertreated for mental health disorders, it is possible that we may have overestimated the relationship between perceived discrimination trajectories and depressive symptoms. Lastly, several of our covariates (e.g., marital status, health insurance status, and labor market participation) were treated as time-invariant predictors in our models. We did not specify household wealth and number of chronic conditions as time-varying covariates in our analyses and it is possible that if the model fit is improved, including these variables as time-varying, may yield a more precise estimation of the relationship between discrimination trajectories and depressive symptoms.

Despite the aforementioned limitations, our study has several notable strengths that provide further insight into the mental health status of black middle-aged and older adults. The findings underscore that the experience of and consequence of discrimination are not uniform and build upon findings from other studies showing within-group heterogeneity in perceived discrimination across time and domains among black middle-aged and older adults. We leveraged a unique opportunity to use a longitudinal data set from an existing, well-characterized cohort to study the cumulative exposure to perceived discrimination. The

identification of distinct profiles of perceived discrimination based on longitudinal patterns of exposure extends the current discrimination literature and may offer several advantages over a cross-sectional discrimination measure. The discrimination trajectories convey additional information by capturing the dynamic nature of discrimination and may lead to greater precision in our understanding of the cumulative burden of discrimination over time. Characterizing the discrimination trajectories provide critical insight into nuanced profiles of psychosocial risk that may be useful for developing culturally- and trauma-informed interventions as well as predicting aging-related clinical endpoints. Our results support burgeoning evidence and provide empirical support that a single point in time measure of perceived discrimination may obscure the full impact of discrimination on health. Our results also draw attention to the need to employ an intersectional lens in discrimination and health research and demonstrated the value of examining the burden of multiple identities. Capturing various aspects of the marginalized lived experiences may obviate underestimating the burden of stress of interlocking systems of oppression.

Improving the measurement of perceived discrimination in the aging process may allow for greater precision in estimating the health vulnerability and consequences due to the cumulative exposure of perceived discrimination. Future work should seek to determine whether perceived discrimination trajectories are associated with physical health outcomes and biological markers of accelerated aging. Distinguishing pathways linking cumulative experiences of psychosocial stress to physiological aging can inform the design of trauma-based and culturally relevant interventions to reduce the cumulative adverse effects of discrimination and improve mental health among middle-aged and older black adults.

Supplementary Material

Supplementary data are available at *Innovations in Aging* online.

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Conflict of Interest

None declared.

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