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Perceived Age Discrimination: A Precipitator or a Consequence of Depressive Symptoms?

Liat Ayalon

Louis and Gabi Weisfeld School of Social Work, Bar Ilan University, Ramat Gan, Israel

Correspondence should be addressed to Liat Ayalon, PhD, Louis and Gabi Weisfeld School of Social Work, Bar Ilan University, Ramat Gan 52900, Israel. E-mail: liat.ayalon@biu.ac.il.

Abstract

Objectives: The main purpose of the study was to examine a bidirectional temporal relationship between perceived age discrimination and depressive symptoms. A secondary goal was to examine whether the negative effects of perceived age discrimination on one's depressive symptoms are stronger among respondents older than 70 years old, compared with respondents between the ages of 51 and 70.
Methods: The Health and Retirement Study is a U.S. nationally representative sample of individuals over the age of 50 and their spouse of any age. A cross-lagged model was estimated to examine the reciprocal associations of depressive symptoms and perceived age discrimination, controlling for age, gender, education, ethnicity, marital status, employment status, satisfaction with financial status, number of medical conditions, mobility, strength and fine motor skills, and memory functioning.
Results: The baseline model for the overall sample resulted in adequate fit indices: CFI = .945, TLI = .940, RMSEA = .024 (90% CI = .023, .025). The cross-lagged effect of perceived age discrimination on depressive symptoms was nonsignificant (B [SE] = −.01 [.04], p = .82), whereas the cross-lagged effect of depressive symptoms on perceived age discrimination was small, but significant (B [SE] = .04 [.02], p = .03). This implies that higher levels of depressive symptoms precede a greater likelihood of perceived age discrimination, net of sociodemographic and clinical variables. The cross-lagged effects did not vary according to age group (51–70 vs >70 years old).
Discussion: The subjective nature of perceived age discrimination is discussed.

Keywords: Ageism—Discrimination—Equality—Interpretation—Stress model—Subjective

Discrimination is a differential behavior toward an individual or a group because of arbitrary characteristics, such as age, gender, or race. There is a distinction between objective and subjective or perceived discrimination (Ayalon & Gum, 2011; Kessler, Mickelson, & Williams, 1999). For instance, an individual might be arbitrarily offered a less innovative medical intervention due to her age, but not be aware that she is being objectively discriminated against. On the other hand, one might believe that the limited time devoted to his medical appointment by his physician is due to his old age and fail to realize that the physician is rather brief with all her patients due to her busy schedule. The former case represents objective discrimination in the absence of perceived discrimination, whereas the latter represents no indication of objective discrimination, accompanied by a sense of perceived discrimination. Objective and subjective discrimination can also go together, so that an individual is both discriminated due to an arbitrary characteristic and is aware of being discriminated against.

The present study concerns discrimination based on one's age or ageism (Butler, 1975). Age discrimination has been understudied compared with discrimination based on race or gender (Nelson, 2005; North & Fiske, 2012). This is despite the fact that in contrast to discrimination based

on race or gender, everyone is susceptible to ageism, if they live long enough (Palmore, 2003). Hence, perceived age discrimination is the most common type of discrimination among Europeans over the age of 18 (Ayalon, 2014).

The present study evaluated the reciprocal associations between perceived age discrimination and depressive symptoms. These associations can go both ways, so that perceived age discrimination may precede higher levels of depressive symptoms and vice versa, higher levels of depressive symptoms may precede perceived age discrimination. Nonetheless, thus far, perceived age discrimination has been examined as a precipitator of negative health and mental health outcomes (Avidor, Ayalon, Palgi, & Bodner, 2016; Vogt Yuan, 2007) and the opposite temporal direction has not been examined. A secondary goal of this study was to place chronological age as a contextual factor, by evaluating whether the negative effects of perceived age discrimination are particularly deleterious in old age. The innovative aspects of the present study stem from the examination of these bidirectional associations simultaneously, using a large U.S. nationally representative sample of older adults over the age of 50.

Perceived Age Discrimination as a Precipitator of Depressive Symptoms

A major premise behind the entire line of research on perceived discrimination is that the interpretation one assigns to an event is likely to color his or her emotional and physical reactions to it (Sawyer, Major, Casad, Townsend, & Mendes, 2012; Weiner, 1985). The well-documented negative consequences of perceived discrimination (Ferraro, 2014; Gergov & Asenova, 2012; Minichiello, Browne, & Kendig, 2000; Schmitt, Branscombe, Postmes, & Garcia, 2014; Vogt Yuan, 2007) can be explained by the stress model, which views discrimination as a source of stress that results in poorer mental health and health outcomes (Clark, Anderson, Clark, & Williams, 1999; Kessler et al., 1999). Perceived discrimination is seen as a situation in which one has no control, and as a result, learned helplessness, apathy, and depression are developed (Abramson, Seligman, & Teasdale, 1978).

In the case of older adults, the effects of perceived age discrimination are expected to be particularly detrimental (Garstka, Schmitt, Branscombe, & Hummert, 2004). This has been explained by the social identity theory (Tajfel & Turner, 2004), which postulates that individuals strive to maintain a positive self-image by ensuring that their group identity is valued. Whereas younger adults are expected to eventually move into the higher status category of middle age and as a result, are less likely to be affected by perceived age discrimination, older adults cannot change their age group. Hence, even when exposed to similar ageist practices, older adults are more likely to be affected compared with younger adults (Garstka et al., 2004).

Consistently, a study which used an experimental manipulation to prime age stereotypes in both older and younger adults has found that the will to live was correlated with the valence of age stereotypes primed among older adults, but not among younger adults. Hence, negative age stereotypes elicited a lower will to live only among older adults (Marques, Lima, Abrams, & Swift, 2014). The authors have attributed this to the fact that age stereotypes are highly relevant and more frequently used among older adults. Thus, the activation of these stereotypes occurs easily (Marques et al., 2014).

The stronger association of perceived age discrimination with negative outcomes among older adults compared with younger adults is consistent with the literature, which has shown that compared with individuals of higher status, those of lower status are more likely to interpret negative events as uncontrollable and internal (Schmitt & Branscombe, 2002) and as a result, are more likely to respond negatively to these events (Kessler et al., 1999).

Nevertheless, a different line of research suggests that perceived age discrimination is actually less pronounced and less detrimental in old age. Even though objectively, older adults are systematically disadvantaged with regard to health, income, education, and employment compared with younger adults, there are inconsistent differences between young and old with regard to perceived age discrimination (Ayalon & Rothermund, under review). The report of lower levels of perceived age discrimination by older adults in the face of objective relative old age disadvantages is likely due to the internalization of negative old age stereotypes by older adults (Kornadt & Rothermund, 2012; Levy, 2009; Rothermund & Brandtstädter, 2003).

It is also possible that one's cohort, rather than merely one's chronological age determine the interpretation of an event as discriminatory. The term ageism was first introduced in 1969 (Butler, 1969). It has since acquired attention as can be seen by a growing number of publications on the topic (Nelson, 2005; North & Fiske, 2012). Possibly, greater awareness of the term among younger generations, also results in a greater likelihood to identify negative everyday events as discrimination based on age among the younger generations.

Perceived Age Discrimination as a Consequence of Depressive Symptoms

The cognitive triad suggests that depressed individuals tend to view themselves, the world and their future in a negative light (Beck, 1970). This implies that not only are individuals more likely to experience negative emotional reactions as a result of perceived discrimination, but at the same time, it is also possible that individuals of worse emotional state are more likely to perceive even neutral events as discriminatory. A study that evaluated this hypothesis using a series of regression analyses, found no support for poor mental health as a predictor of perceived racial discrimination in a sample of Black respondents (Brown et al., 2000). A different study, which employed a cross-lagged analysis found evidence for perceived discrimination as a precipitator of

anger and aggression among North American indigenous youth, but not as a consequence (Hartshorn, Whitbeck, & Hoyt, 2012).

A different explanation suggests that because depression is often manifested somatically among older adults, who tend to report high levels of agitation and hypochondriasis (Hegeman, Kok, Van der Mast, & Giltay, 2012), a slower gate speed and concentration difficulties (Demakakos et al., 2013), depressed older adults might be at a greater risk for experiencing higher levels of ageism or healthism (e.g., discrimination based on one's health status; Leonard & Roberts, 2015). This is because people are likely to interpret these depressive symptoms as signs of old age and respond negatively to them.

The Present Study

Given competing theories and predictions, the first hypothesis of the present study was that a temporal relationship between perceived ageism and depressive symptoms is bidirectional. Perceived ageism is a potential precipitator of depressive symptoms as it likely poses a great source of uncontrollable stress for older adults. At the same time, depressive symptoms are also likely to color one's interpretation of the world, and as such, potentially precipitate and intensify the perception of age discrimination. Moreover, somatic symptoms, which are common among depressed older adults, are more likely to elicit ageism. A cross-lagged model allows examining the hypothesized reciprocal associations between perceived ageism and depressive symptoms, net of sociodemographic and clinical variables.

A second hypothesis concerns age group affiliation, as a potential moderator of the relationship between perceived age discrimination and depressive symptoms. Consistent with past research (Garstka et al., 2004), it is expected that perceived age discrimination has deleterious effects, particularly in old age. Hence, it is hypothesized that perceived age discrimination has a stronger temporal association with depressive symptoms among older adults, compared with younger individuals. Given the tendency of older adults to report depressive symptoms somatically (Demakakos et al., 2013), it is also possible that the temporal association between depressive symptoms and perceived age discrimination is stronger among older adults.

Potential sociodemographic and clinical variables of interest

In addition to age, certain sociodemographic and clinical variables are included in the analysis, as controls. Specifically, past research has shown that compared with men, women are more likely to report depressive symptoms (Silverstein et al., 2013) and are more likely to be exposed to ageism, given cultural norms, which portray older women as socially invisible (Jankowski, Diedrichs, Williamson, Christopher, & Harcourt, 2014). Education has been associated with both depressive symptoms and

perceived discrimination. Higher levels of education are associated with lower levels of depression (Lynch & von Hippel, 2016), but higher levels of perceived age discrimination (Rippon, Kneale, de Oliveira, Demakakos, & Steptoe, 2014). Similarly, both marriage and employment are protective mechanisms in the face of depression (Montgomery, Cook, Bartley, & Wadsworth, 1999; Strine et al., 2015) and in the case of perceived ageism (Luo, Xu, Granberg, & Wentworth, 2011; Rippon et al., 2014). Lower socioeconomic status, on the other hand, has shown to be a risk for depressive symptoms (Elovainio et al., 2012) as well as for perceived ageism (Rippon et al., 2014; Rippon, Zaninotto, & Steptoe, 2015). Even though ethnicity has not been extensively examined in relation to perceived ageism, it has shown to be a source of variations with regard to both perceived discrimination and depressive symptoms. Black older adults tend to report higher levels of lifetime discrimination, whereas Latino older adults are less likely to report exposure to everyday discrimination compared with Whites. White older adults, on the other hand, are less likely to report depressive symptoms compared with ethnic minorities (Ayalon & Gum, 2011). Finally, poor medical status, poor cognitive status and functional impairment have all shown to be associated with depression (Chang-Quan et al., 2010; Jackson et al., 2014; Rock, Roiser, Riedel, & Blackwell, 2014; Wilson et al., 2002) as well as with discrimination (Gekoski & Knox, 1990; Jönson & Larsson, 2009; O'Connor & McFadden, 2012). Although these variables are not the focus of the present study, they are used as control variables in order to assess the net prospective associations of perceived age discrimination and depressive symptoms.

Methods

Sample

The Health and Retirement Study (HRS) is a biannual longitudinal panel of U.S. nationally representative individuals over the age of 50 and their spouses of any age. The HRS is supported by the National Institute on Aging (NIA U01AG009740) and the Social Security Administration. As of 2006, a leave-behind, self-completed psychosocial questionnaire has been administered to half of the HRS sample every 4 years.

The present study is based on all respondents over 50 years of age, who completed the discrimination questionnaire on at least one of the three waves (2006, 2010, 2014; $N = 7,712$). For the years 2006–2014, response rate to the core HRS survey was around 90% and the overall response rate to the psychosocial questionnaire was around 70%.

Those who completed at least one wave of data collection concerning perceived age discrimination ($N = 7,712$) were younger (mean [SE] = 66.0 [.21]) and more educated (mean [SE] = 12.8 [.07]) compared with those who did not complete the questionnaire ($N = 642$; mean [SE] = 76.2

[1.30], $F[1, 56] = 57.5$, $p < .001$; mean [SE] = 10.5 [.57], $F[1, 56] = 17.87$, $p < .001$; respectively). They also were more likely to be employed (42.1% vs 5.7%; $\chi^2[1] = 11.7$, $p < .001$) and married (68.0% vs 50.3%; $\chi^2[1] = 6.0$, $p = .04$) compared with those who did not respond to the perceived age discrimination question. In addition, they were more likely to be White (82.9% of those who responded at least once vs 67.3% of those who provided no response) and less likely to be Black (9.4% vs 24.6%, respectively; $\chi^2[2] = 15.77$, $p < .01$). Finally, those who completed at least one wave concerning perceived age discrimination were less depressed (mean [SE] = 1.5 [.03]), less impaired, as measured by mobility, strength, and fine motor skills (mean [SE] = 2.4 [.05]) and had better memory functioning (mean [SE] = 10.1 [.06]) compared with those who did not complete at least one wave of measurement (mean [SE] = 2.4 [.26], $F[1, 56] = 13.1$, $p < .001$; mean [SE] = 4.2 [.50], $F[1, 56] = 12.3$, $p < .001$; mean [SE] = 6.7 [.53], $F[1, 56] = 42.4$, $p < .001$, respectively).

Sample characteristics and correlations between variables are presented in Table 1. The average age of the sample was 66.0 ($SE = .21$) and the majority were women (54.8%). A total of 68.0% were married and 42.1% were employed. Almost 30% of the sample acknowledged perceived age discrimination in everyday life. The average number of depressive symptoms was 1.5 [$SE = .03$] out of a maximum of eight symptoms. Supplementary Table 1 presents the associations between depressive symptoms and perceived age discrimination across the three waves of data collection. Significant associations between depressive symptoms and perceived age discrimination were evident across all three waves.

Measures

Perceived age discrimination
Six items addressed perceived discrimination in everyday life (Williams, Neighbors, & Jackson, 2003; Williams, Yu, Jackson, & Anderson, 1997). These items were: being treated with less courtesy and respect than others, receiving poorer services than others from restaurants or stores, people act as if you are not smart, people act as if they are afraid of you, being threatened or harassed, receiving poorer services or treatment than others from doctors and hospitals. Respondents were asked to indicate the frequency with which each of the events had happened on a 6-point scale. The average number of discriminatory events reported ranged between 1.5 and 1.7 across the three waves of data collection. Internal consistency across the three waves was good: $\alpha = .79–.83$.

These questions were followed by a subsequent question: "If any of the above has happened to you, what do you think were the reasons why these experiences happened to you?" (Kessler et al., 1999). Respondents were able to choose from a variety of potential explanations including ancestry or national origin, gender, race, age, religion, weight, physical disability, physical appearance, sexual orientation, financial status, or other. Respondents were allowed to choose more than one reason to their experiences of everyday discrimination.

Those who attributed any of the experiences of discrimination to age were classified as reporting perceived age discrimination (1) and the remaining respondents, who completed the everyday discrimination questionnaire, but did not attribute their experiences to age were classified as not reporting age discrimination (0). Those who had missing values on the questions about perceived discrimination in everyday life were coded as missing and were not included in this analysis.

Depressive symptoms
The Center for Epidemiological Studies-Depression (CES-D) (Geisser, Roth, & Robinson, 1997; Radloff, 1977) was used as part of the core interview to assess eight depressive symptoms, with a yes–no response format. After reverse-coding appropriate items, a total score was calculated. Range was between 0 and 8, with a higher score indicating greater depressive symptoms. Internal consistency was good with a range between $\alpha = .77–.81$ across waves.

Sociodemographic information
Age (in years), gender, and years of education (range between 0 and 17), marital status (married = 1, not married = 0), employment status (employed = 1, not employed = 0), ethnicity (White = 0, Latino = 1, Black = 2), overall satisfaction with financial situation (1 = not at all satisfied, 5 = completely satisfied), and number of chronic medical conditions (e.g., high blood pressure, diabetes, cancer, lung disease, heart condition, stroke, arthritis; range between 0 and 7) were gathered based on self-report.

Ten self-report items were used to assess mobility, strength, and fine motor skills (e.g., running/jogging about 1 mile, walking one block, climbing several flights of stairs, picking a dime up, pulling or pushing large objects). A higher score indicated greater impairment, with 10 representing maximum impairment and 0 representing no impairment ($\alpha = .87$) (Fonda & Herzog, 2004).

A composite memory functioning score was constructed based on two memory tasks (range 0–20): (a) an immediate word recall task: respondents are presented with a list of 10 nouns, which they are asked to spontaneously repeat and (b) a delayed verbal memory task: after 5 min of engaging in other tasks, respondents are asked to repeat the list of nouns previously presented to them ($\alpha = .85–.87$; Ofstedal, Fisher, & Herzog, 2005).

Analysis

Descriptive statistics and correlations between variables were calculated. Next, Structural Equation Modeling with Mplus version 7.3 (Muthén & Muthén, 1998–2012) was used to evaluate the cross-lagged autoregressive model outlined in Figure 1 (Finkel, 1995). The model allows for the

Table 1. Sample Characteristics in 2006 and Correlations Between Variables (*N* = 7,712)

	Mean (*SE*)/%	1	2	3	4a	4b	5	6	7	8	9	10	11
1. Age	66.0 (.21)												
2. Women	54.8%	.01											
3. Education (years)	12.8 (.07)	-.16***	-.05***										
4. White	82.9%												
(a) Black	9.4%	-.08***	.05***	-.25***									
(b) Latino	7.7%	-.09***	.03**	-.36***	.76***								
5. Perceived age discrimination	29.8%	.09***	-.03*	.02*	-.05***	-.05***							
6. Satisfaction with financial status (1–5)	3.2 (.02)	.20***	-.04**	.11***	-.18***	-.14***	-.06***						
7. Marital status (married)	68.0%	-.21***	-.26***	.11***	-.14***	-.09***	-.05***	.12***					
8. Employment status (employed)	42.1%	-.49***	-.08***	.20***	-.02	-.01	-.02	-.09***	.13***				
9. Depressive symptoms (0–8)	1.5 (.03)	.00	.10***	-.22***	.12***	.15***	.07***	-.25***	-.21***	-.13***			
10. Medical conditions (0–7)	1.8 (.02)	.29***	.02	-.15***	.06***	.01	.06***	-.08***	-.11***	-.30***	.21***		
11. mobility, strength, and fine motor skills (0–10)	2.4 (.05)	.22***	.17***	-.25***	.11***	.08***	.06***	-.17***	-.18***	-.28***	.43***	.44***	
12. Memory functioning (0–20)	10.0 (.06)	-.39***	.10***	.37***	-.20***	-.19***	-.02	.01	.14***	.27***	-.16***	-.21***	-.23***

Notes: SE = standard error.

*p < .05. ***p* < .01. ****p* < .001.

simultaneous evaluation of the reciprocal associations of depressive symptoms and perceived age discrimination while controlling for measurement bias. Age in 2006, gender, education, ethnicity, marital status, employment status, satisfaction with financial status, number of medical conditions, mobility, strength and fine motor skills, and memory functioning were included as covariates. Depressive symptoms and memory functioning were modeled as latent constructs. Observed indicators are used to create latent constructs to remove the measurement error from the model. This results in better estimates of the true scores of each construct and a more accurate estimation of the relationships over time (Burkholder & Harlow, 2003). Perceived age discrimination and all other covariates were modeled as observed variables.

To account for missing data, the Mplus WLSMV estimator that allows for maximum likelihood estimation with robust standard errors and chi-square calculation in the presence of missing values was used. Theta parameterization was applied given the dichotomous nature of perceived age discrimination. Weights and strata provided by the HRS were used to account for the complex survey design. To estimate the models' goodness-of-fit, we followed the recommendations of Schreiber and colleagues (2006) and report, in addition to the chi-square statistic, the comparative fit index (CFI), the Tucker Lewis index (TLI), and the root mean-square error of approximation (RMSEA). CFI and TLI close to or above .95 combined with RMSEA of .06 or lower indicate reasonably good fit (Hu & Bentler, 1999). It is important to note that because of the large sample size, we would expect a significant chi-square. Hence, greater attention is placed on the latter fit indices (Bentler & Bonett, 1980). The significance level criterion for all statistical tests was set at .05. Unstandardized coefficients are reported in the text (B), whereas standardized and unstandardized coefficients are provided in Figure 1.

Because factorial invariance over time points is a major requirement of a valid autoregressive model (Finkel, 1995),
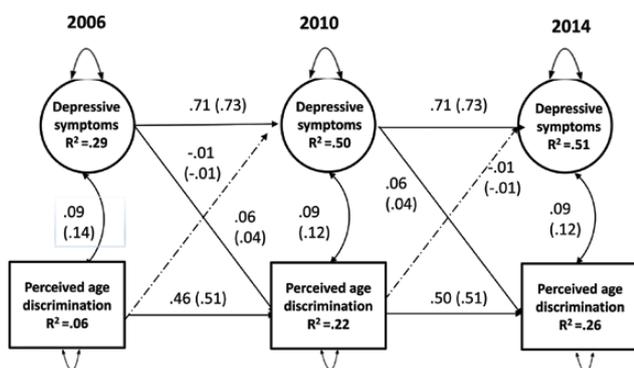

Figure 1. A cross-lagged panel model of the reciprocal relations of depressive symptoms and perceived age discrimination. A structural equation model of cross-lagged depressive symptoms and perceived age discrimination with standardized parameters. Unstandardized coefficients are reported in parenthesis. The solid lines indicate paths statistically significant at $p < .05$. The dotted lines indicate nonsignificant paths. R^2 represents the proportion of explained variance.

we first tested for and assured "weak factorial invariance" (Meredith, 1993) by setting the factor loadings of the main research latent variable, depressive symptoms, as equal across waves. Factorial invariance in relation to age group categories (51–70 vs. >70 years old) was also tested to address the second hypothesis concerning age as a moderator of the relationship between perceived age discrimination and depressive symptoms.

In order to test the first hypothesis concerning the reciprocal lagged effects of depressive symptoms and perceived age discrimination, the model outlined in Figure 1 was specified. Stationarity was tested for and specified by setting all path coefficients to be invariant across waves (except for the correlation between depressive symptoms and perceived age discrimination at Wave 1).

To examine the second hypothesis concerning age (age between 51 and 70 years; $N = 4,681$ vs. age > 70 years, $N = 3,031$) as a moderator of the cross-lagged effects of perceived age discrimination and depressive symptoms, the grouping command and the DIFFTEST function were used. The restricted model, in which the cross-lagged effects were comparable across the two age groups was examined against a model that allowed for the cross-lagged effects to differ in the two age groups. A significant result suggests that the cross-lagged effects are significantly different in the two age groups.

Results

As a first step of the main analysis, the measurement model of the latent construct, depressive symptoms, was examined. Depressive symptoms were examined over three time points, with factor loadings constrained for equality across waves. Like-item indicators were allowed to correlate across the three waves. The model fitted adequately to the data, with $\chi^2(247) = 1,887.32$ $p < .001$, CFI = .966, TLI = .963, RMSEA = .028 (90% CI = .026, .029). See Supplementary Table 2 for factor loadings.

Next, the hypothesized autoregressive cross-lagged model with covariates was fitted. Time-invariant sociodemographic and clinical variables at the study onset were specified to affect depressive symptoms and perceived age discrimination in 2006. In addition, age, gender, education, and ethnicity were specified to affect memory functioning in 2006. This model fitted the data adequately, $\chi^2(635) = 1919.926$, $p < .001$, CFI = .945, TLI =.940, RMSEA = .024 (90% CI = .023, .025) and is reported in Figure 1. The autoregressive effects of depressive symptoms (B [SE] = .73 [.03], $p < .001$) and perceived age discrimination (B [SE] = .51 [.03], $p < .001$) were substantive and significant across the three waves, pointing to the stability of these constructs. The cross-lagged effect of depressive symptoms on perceived age discrimination was low, but significant (B [SE] = .04 [.02], $p = .03$), whereas the cross-lagged effect of perceived age discrimination on depressive symptoms was nonsignificant (B [SE] = − .01 [.04],

p = .82), net of the effects of the sociodemographic and clinical variables.

Finally, a moderation analysis was conducted to examine whether the cross-lagged effects of depressive symptoms and perceived age discrimination vary by age group (51–70 years old vs >70 years old).

First, weak factorial invariance was established by demonstrating that the loadings of the eight depressive symptoms items and the loadings of the two indicators of memory functioning are similar across the two age groups $\chi^2(76) = 1010.236$, $p < .001$, CFI = .954, TLI = .945, RMSEA = .055 (90% CI = .052, .058).

Next, a cross-lagged model, in which age group serves as a moderator was evaluated. The unconstrained model, in which the cross-lagged effects of perceived age discrimination and depressive symptoms were free to vary in the two age groups resulted in adequate fit: $\chi^2(1, 279) = 2,630.551$, $p < .001$, CFI = .944, TLI = .939, RMSEA = .024 (90% CI = .023, .026). This model was not significantly different from the model, which specified comparable cross-lagged effects in the two age groups: $\chi^2(2) = 3.90$, $p = .14$, suggesting comparable cross-lagged effects across age groups. See Table 2 for model fit indices. Testing the cross-lagged moderation analysis, using different age categories (51–65 vs >65; 51–75 vs >75 years old) yielded similar conclusions, which are available upon request.

Figure 1 presents the main elements of the concluding model (standardized and unstandardized paths and proportions of explained variance), with relations between controls and main research variables omitted from the figure.

Discussion

The present study examined the bidirectional associations of perceived age discrimination and depressive symptoms and their stability over an 8-year period in a U.S. nationally representative sample of individuals over the age of 50. The study contributes to the literature, which has primarily focused on the negative effects of perceived discrimination, but tended to neglect its subjective nature as well as the role that one's emotional state plays in reports of discrimination. Thus far, less attention has been given to the possibility that one's mental health status would precede

the interpretation of an event as discriminating. This is despite the fact that a main premise in the field of cognitive behavioral therapy, for instance, is that one's mood is directly related to the interpretation of life events (Beck, 1970). Hence, the interpretation of an event as negative, likely stems not only from its objective nature, but also from one's mood (Sawyer et al., 2012).

The findings suggest that net of the effects of a variety of sociodemographic and functional variables, higher levels of depressive symptoms precede a greater likelihood of perceived age discrimination. This supports the claim that one's mood impacts the interpretation of everyday events (Beck, 1970). However, an alternative interpretation would argue that depressive symptoms have notable behavioral manifestations, such as a slower gate speed or concentration difficulties (Demakakos et al., 2013), which could potentially expose older adults to higher levels of age discrimination or healthism (Leonard & Roberts, 2015). This is because individuals are likely to interpret these symptoms as signs of old age and respond negatively to them.

One reason for the relative research disregard to the potential role of depressive symptoms as precipitators of perceived discrimination is the fact that by emphasizing the subjective nature of discrimination, one potentially devalues its significance. Researchers might be motivated to explore the negative impact of discrimination in order to create a better world that fosters equality. There might be less societal incentive to show that depressive symptoms precede perceived discrimination. Nevertheless, this information is important as it emphasizes the subjective nature of perceived discrimination and serves as a harbinger for future research, which will provide more refined estimates of subjective versus objective discrimination.

A recent meta-analysis has shown that the negative effects of discrimination are associated with higher levels of depressive symptoms and poorer mental health (Schmitt et al., 2014). This is supported by many studies that have shown that perceived discrimination results not only in poorer mental health, but also in poorer physical health (Gee, 2002; Sawyer et al., 2012) and an increased risk for mortality (Barnes et al., 2008). These negative effects have been explained by the stress and the learned helplessness models. These studies are inconsistent with the present

Table 2. A Comparison of Model Fit Indices

Model	χ^2 [df], p-value	$\Delta \chi^2$ [df], p-value	CFI	TLI	RMSE [90% CI]
Baseline cross-lagged model with no moderation effects	1,919.93 [635], $p < .001$		.945	.940	.024 [.023, .25]
The lagged effect of perceived age discrimination on depressive symptoms varies across age groups	2,630.55 [1,279], $p < .001$		.944	.939	.024 [.023, .26]
The lagged effect of perceived age discrimination on depressive symptoms does not vary across age groups	2,623.124 [1,281], $p < .001$	3.90 [2], $p = .14$	.944	.939	.024 [.023, .26]

findings, however, which have shown that net of sociodemographic and clinical variables, once the cross-lagged associations of perceived age discrimination and depressive symptoms are examined simultaneously; perceived age discrimination is not associated with higher levels of depressive symptoms 4 years afterwards.

Following past research, which has shown that older adults are objectively disadvantaged relative to younger segments in society (authors' own), it was hypothesized that the detrimental effects of perceived age discrimination would be particularly pronounced in the case of older adults because they belong to a low status group (Garstka et al., 2004). It was further hypothesized that older adults who present with depressive symptoms would be more likely to experience age discrimination due to the fact that many somatic symptoms of depression mimic frailty in old age and as such, attract higher levels of ageism and healthism. However, the present study found no age group differences in the cross-lagged effects. Possibly, relying on a much younger sample to represent the younger age group and a substantially older sample to represent the older group would have resulted in significant age group differences. The lack of significant age group differences in the present study could also have stemmed from the fact that the study relied on actual age as a moderator, rather than on subjective age. Possibly, it is not one's chronological age, but rather one's subjective age, which increases the susceptibility to the detrimental effects of perceived age discrimination (Eibach, Mock, & Courtney, 2010). Because the construct of subjective age became available only in the 2008 wave of the HRS, it was impossible to test this hypothesis in the present study.

Despite its strengths, the study has several limitations that should be acknowledged. First, even though this is a longitudinal study, it cannot provide information about cause and effect, as no intervention study was conducted. Instead, the study only points to the temporal order of reciprocal associations. The study also did not control for all possible covariates of importance. Second, the study lacks data on objective indicators of age discrimination. Future research will benefit from examining objective indicators against perceived age discrimination. Third, the division of the sample into two age groups (e.g., 51–70 vs >70 years old) was somewhat arbitrary. Nevertheless, a sensitivity analysis in which other age group categories were examined yielded similar conclusions. Finally, the assessment of perceived discrimination in everyday life had no concrete timeframe. This could have biased the cross-lagged analysis, which examined changes in perceived age discrimination every 4 years. Nonetheless, past research has shown that participants change their responses over time even regarding concrete events that had either happened or not in their early childhood (Ayalon, 2015). Hence, it is expected that responses in relation to perceive age discrimination also vary over time. In addition, the measure provides no information about the particular events that were seen as ageist, but rather whether or not the entire set of experiences was perceived as being due to age discrimination. Nevertheless, this is a very common measure for the assessment of everyday discrimination (Ayalon & Gum, 2011; Kessler et al., 1999).

A major implication of the present study is the fact that it is important to view perceived age discrimination as a subjective experience, in the context of one's preceding mood state. The findings clearly indicate that the cross-lagged effect of depressive symptoms on perceived discrimination is significant, whereas no cross-lagged effect of perceived discrimination on depressive symptoms was found. Another interesting finding concerns the comparable cross lagged effects among those between the age of 51 and 70 and those older than 70. This stresses the need for further research to identify groups that are most susceptible to perceived age discrimination, as chronological age may not be a major factor.

Supplementary Material

Please visit the article online at http://gerontologist.oxford-journals.org/ to view supplementary material.

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