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## Longitudinal associations between perceived age discrimination and subjective well-being: variations by age and subjective life expectancy

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### ABSTRACT

**Objectives:** Perceived age discrimination can have negative effects on one's subjective well-being (SWB). The response to age discrimination might differ based on age, and based on perceived longevity, or subjective life expectancy (SLE). These differential effects have not yet been prospectively examined within adult life span samples.

**Method:** We examined the association between perceived age discrimination at baseline (T1) and SWB at follow-up (T2), and the moderation effect of SLE. We compared differences in these effects between middle-aged and older adults. Analyses were based on participants who took part in the 2008 (T1) and 2011 (T2) assessments of the German Ageing Survey (DEAS; listwise  $N = 1534$ ), a population-based representative sample of the German adult population. Participants were categorized as middle-aged (ages 40–64;  $n = 919$ ) or older adults (ages 65–93;  $n = 615$ ).

**Results:** Regression analyses indicated that T1 perceived age discrimination significantly predicts lower T2 SWB among middle-aged, but not among older adults, after adjusting for covariates and T1 SWB. There is a significant interaction between age discrimination and SLE for predicting SWB, only among middle-aged participants, suggesting that age discrimination predicts decreases in SWB for those reporting higher, but not lower levels of SLE.

**Conclusion:** People in the transition from midlife to old age, who hold higher SLE, appear to be more vulnerable to age discrimination. This may be due to the experience of age discrimination as an 'off-time', or unexpected event for those in midlife who have a higher expectation to live longer.

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Age discrimination;  
subjective life expectancy;  
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The perception that one has been unfairly discriminated against can be a significant psychosocial stressor (e.g. Paradies, 2006). Older adults often experience ageism, or discrimination due to their age (Nemmers, 2004), which can have a devastating effect on their well-being (Nelson, 2005), and on their health (Vauclair et al., 2015). In a recent study, perceived discrimination due to age predicted extensive negative changes in these domains over a period of four years (Sutin, Stephan, Carretta, & Terracciano, 2015). The present study considers the impact of perceived age discrimination on subjective well-being (SWB), which refers to how people evaluate their lives (Diener, Suh, Lucas, & Smith, 1999). Furthermore, we attempt to examine the role played by age-related and time-related normative expectations in these associations. Hence, we assess the consequences of perceived age discrimination among a group of middle-aged adults, as well as among a group of older adults, over a three-year period. Among these groups, we also assess whether personally held evaluations of one's life expectancy shape the long-term reactions to perceived age discrimination.

Chronological age is an important category that shapes people's expectations and evaluations in the social sphere (Garstka, Schmitt, Branscombe, & Hummert, 2004; Neugarten, 1979). It is plausible that older adults expect a certain amount of age discrimination due to previous exposure to negative stereotypes related to age, and their internalization (i.e. Levy, 2001). Although the assimilation of aging-related stigmas can

have negative outcomes (Levy, Slade, Kunkel, & Kasl, 2002), the anticipation of age discrimination might lead to a certain level of preparedness and therefore mitigate its effect on one's mental health. Indeed, perceptions of age discrimination in a cohort of women in late midlife, who likely had no previous experience with age discrimination, were associated with worse psychological well-being (Sabik, 2013). Drawing on formulations of time-related expectations over the life-course (Neugarten, 1979), it has been demonstrated, for example, that younger adults respond more negatively to major, 'off-time' health events, relative to older adults, who come to expect such health events in later life (Wurm, Tomasik, & Tesch-Röurm, 2008). It might be the case that perceived age discrimination in midlife, during the transition to old age, could be associated with worse psychological outcomes, as opposed to the later years of older adulthood.

In addition to actual age, personally held time-related perspectives might play a role in shaping the response to perceived age discrimination. Attributes relating to perceptions of the future, such as optimism, buffer against effects of negative age stereotypes on physical and psychological outcomes (Wurm & Benyamini, 2014). In later life, the personal sense of time that remains until death can predict a wide range of effects, more so than one's chronological age (Carstensen, 2006). Consistent with this perspective, a higher subjective distance-to-death is a concomitant of several positive outcomes, and it has been shown to serve as a resource, or

buffering mechanism against adversity in later life (Shrira, Bodner, & Palgi, 2014).

Conversely, feeling that one's future is expansive, and that one has many years remaining before death, might be incongruous with the experience of 'off-time' difficulties related to aging. Foreshortened perceptions of one's remaining years have been linked with processes that are involved with actual longevity, such as lower emotional complexity (Palgi et al., 2014). These phenomena might reflect certain shifts in motivation that characterize the transition into old age, which involves fewer positive expectations for the future, and a functional focus on prevention of loss (Baltes, 1997). Possibly, feeling like one has longer to live, and being actually younger, could hinder one's preparedness for some age-related losses or adversities, such as perceived age discrimination. It may be the case, however, that age, in and of itself, does not predict one's long-term reaction to age-related discrimination. Rather, belonging to a younger age category (i.e. middle adulthood, which is normally not associated with negative experiences of ageism to the same extent as older adulthood), coupled with a subjective sense that one has many years left to live, might lead one to experience discrimination based on age as 'off-time', and therefore to feel more vulnerable to it.

The goal of this study is to address the interplay of actual age with one's subjective life expectancy (SLE; Lee & Smith, 2015), a proxy of subjective sense of time left until death, in shaping outcomes of perceived age discrimination on SWB. Chronological age is not sufficiently informative for predicting how one might respond when encountering perceived age discrimination. We suggest that subjective evaluations regarding personal time, such as SLE, in conjunction with age, shape people's expectations for normative occurrences throughout the life course. Consequently, people with high as opposed to low SLE, who experience age discrimination will be more likely to experience it as 'off-time' and disruptive, leading to lower levels of SWB over time. Yet, this moderation effect will only be found among middle-aged, as opposed to older adults, since age discrimination is relatively less expected to occur around midlife. Specifically, there will be a three-way interaction among perceived age discrimination, SLE, and age group in the prediction of SWB, such that SLE will moderate the relationship between perceived age discrimination and SWB for middle-aged adults, and it will not be a significant moderator for these associations among older adults. Figure 1 depicts the three-way interaction model.

## Method

### Recruitment and procedure

This research is drawn from the German Ageing Survey (DEAS; Engstler & Motel-Klingebiel, 2010), a longitudinal, population-based representative study of the German community-dwelling population. Data for this study come from a sample of participants, who were interviewed in 2008 (T1), and in 2011 (T2). There were 1534 participants who were interviewed at both times and who filled out 'drop-off' self-report questionnaires, including questionnaires on subjective beliefs and age-related attitudes. Their ages were 40–93, and the mean age was 62.49 ( $SD = 11.21$ ). The sample was categorized as middle-aged (ages 40–64,  $n = 919$ ) and older adults (ages 65–93,  $n = 615$ ). Most of the middle-aged sample was female (56%), whereas most of the older adult sample was male (62%,  $p < .000$ ). The middle-aged respondents had a higher mean monthly income (2997 Euro,  $SD = 2442$ ) than the older adults (2390 Euro,  $SD = 1641$ ,  $p < .001$ ). In both samples, most participants lived in West Germany (a little over 60%,  $p = .19$ ), were currently married (a little over 70%,  $p = .29$ ), and about half of the respondents in both groups reported a medium level of education (50%). However, slightly more middle-aged adults reported having a high level of education (45%, compared with 40% of the older adults,  $p = .003$ ).

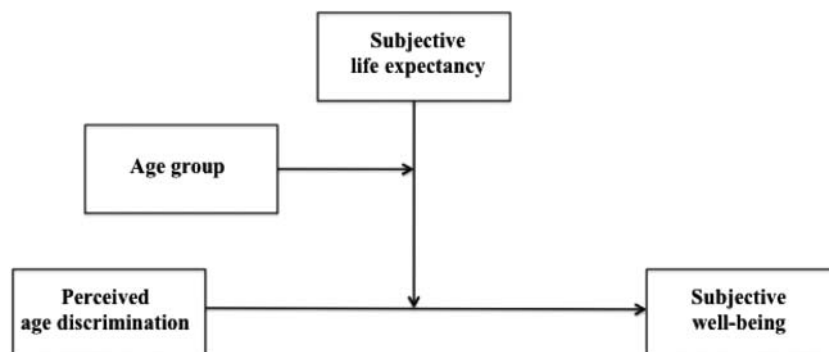
### Measures

Subjective well-being (SWB; T1 & T2). SWB scores were based on: (1) the five-item Satisfaction with Life Scale (Pavot & Diener, 1993), which includes judgments of quality of life on a five-point scale (Cronbach's  $\alpha$  for T1 = .98 and T2 = .84); (2) the 10-item positive affect scale drawn from the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988), which includes positive emotional experiences over the past few months, on a five-point scale (Cronbach's  $\alpha$  for T1 = .99, and T2 = .86). Scores, which represent the mean of at least three items, were standardized. The combined mean scores represent SWB.

Perceived age discrimination (T1). Participants were asked whether they had been discriminated against, or placed at a disadvantage due to their age, in the past 12 months (yes/no).

Subjective life expectancy (SLE; T1). Respondents were asked what age they think they will live to. Higher scores indicate a higher SLE.

Covariates (T1). Participants were interviewed regarding gender; age; family status (coded as married or not married);



**Figure 1.** Proposed model of the three-way interaction of perceived age discrimination with subjective life expectancy and age group for predicting subjective well-being.

level of education; net monthly income (in Euro); area of residence (East/West Germany); self-rated health (SRH); and physical limitations (a single item inquiring through a three-point scale whether one has been limited in normal activities in the past six months due to health problems).

## Results

In a preliminary analysis gauging the conditional effects of age on the associations between the study variables in the total sample, we tested a regression with a three-way interaction between age, age discrimination, and SLE at T1, for predicting T2 SWB. Covariates were entered, as well as T1 SWB. The interaction was probed using the PROCESS computational macro (Hayes, 2012). The three-way interaction was significant ( $B = .19$ ,  $SE = .06$ ,  $p = .001$ ;  $R^2$  change = .004,  $p = .001$ ). The two-way interaction between age discrimination and SLE, was only significant among people whose age was 1  $SD$  below the mean ( $B = .02$ ,  $SE = .01$ ,  $p = .01$ ), but not for those whose age was 1  $SD$  above the mean ( $B = -.01$ ,  $SE = .01$ ,  $p = .44$ ).

In order to further examine the moderation effect between age discrimination and SLE, and based on the differential predictions between the age groups revealed in the three-way interaction, the sample was stratified into age categories as described in the Methods section. Table 1 presents descriptive statistics of the study variables in each sample. Of the middle-aged respondents, 107 (11%) reported experiencing age discrimination, compared to 58 (9%) of the older adults (a Chi-square test for group differences was not significant,  $\chi^2(1) = 1.90$ ,  $p = .17$ ). We again predicted T2 SWB, in separate regression models for each age group. Step 1 included T1 chronological age, T1 age discrimination, and SLE. Covariates were entered in Step 2. Step 3 included the two-way interaction between age discrimination and SLE. Table 2 presents the regression models.

Among the middle-aged participants, age discrimination predicts worse SWB at T2, and SLE predicts better SWB. These coefficients remained significant in Step 2 after adjusting for T1 SWB and the covariates. The interaction in Step 3 between age discrimination and SLE was significant. As can be seen in Figure 2, for those with lower SLE at 1  $SD$  below the mean,

**Table 1.** Mean scores of study variables.

Group	Middle-age (40–64); $n = 919$		Older adults (65–93); $n = 615$		$t(1532)$
	$M$	$SD$	$M$	$SD$	
SWB T1	-.02	.83	.06	.76	1.86
SWB T2	.00	.87	-.05	.83	0.52
SLE T1	81.59	8.13	84.38	5.81	7.36***

Note: T1 = Time 1, 2008; T2 = Time 2, 2011; SWB is the mean of the standardized scores of positive affect and satisfaction with life. SWB = subjective well-being; SLE = subjective life expectancy.

\*\*\* $p < .001$ .

the association between age discrimination and SWB is not significant ( $B = .06$ ,  $SE = .08$ ,  $p = .49$ ) compared with those whose SLE is higher, at 1  $SD$  above the mean, for whom there is a significant negative association between age discrimination and SWB ( $B = -.37$ ,  $SE = .09$ ,  $p < .001$ ). For the older-adult group, after adjusting for covariates and T1 SWB, age discrimination does not predict SWB, and there is no interaction effect.

In order to rule out that the effects found here are a result of the inverse, or reciprocal connection between SWB and later age discrimination, we also conducted a logistic regression analysis predicting T2 age discrimination with T1 SWB, controlling for T1 age discrimination, on the whole sample. SLE and age were also added as moderators to the analysis. SWB, age, and SLE at T1 did not significantly predict T2 age discrimination ( $B$ s = .85, -.01, -.02,  $SE = 5.65$ , .08, .06,  $ps = .88$ , .90, .70, respectively). T1 age discrimination was the only significant predictor ( $B = 2.50$ ,  $SE = .16$ ,  $p < .000$ ).

## Discussion

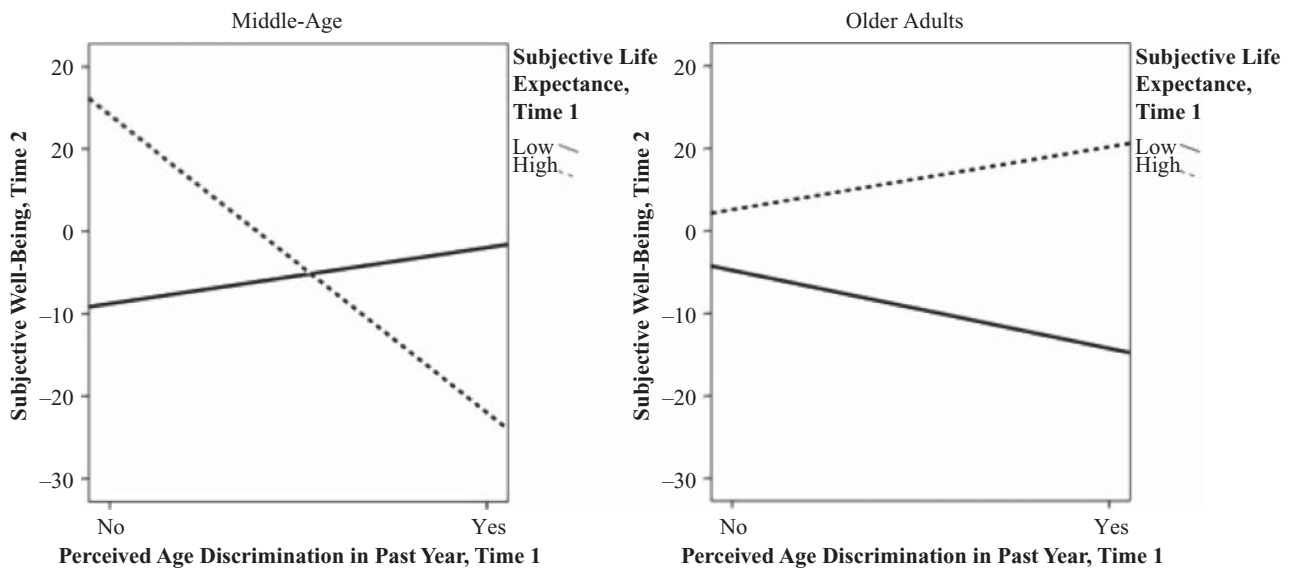
This is the first study, to our knowledge, to address concomitants of perceived age discrimination within stratified age groups in midlife and onwards. Results show that those aged 40–64 (middle-aged) and those who report that they expect to live for a longer number of years (high SLE), appear to be more susceptible in their SWB three years after reporting experiences of perceived age discrimination. At first glance, the present findings seem to contradict previous findings, which showed age discrimination to have more negative effects on the well-being of older adults (Garstka et al., 2004).

**Table 2.** Hierarchical multiple regression analyses predicting T2 SWB by T1 age discrimination, SLE, and their interactions among middle-age and older adults.

Predicting variables	Middle-age (40–64); $n = 919$			Older adults (65–93); $n = 615$		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
	$B$ (SE)	$B$ (SE)	$B$ (SE)	$B$ (SE)	$B$ (SE)	$B$ (SE)
Age	.08 (.05)	.08* (.04)	.08* (.04)	-.24** (.09)	-.03 (.07)	-.03 (.09)
SLE	.19*** (.03)	.08*** (.02)	.32*** (.07)	.20*** (.05)	.07 (.04)	-.06 (.13)
Age discrimination T1 <sup>e</sup>	-.52*** (.09)	-.15* (.07)	-.20** (.07)	-.32** (.11)	-.01 (.09)	-.03 (.09)
Gender <sup>a</sup>		.03 (.04)	.02 (.04)		.12 (.06)	.12* (.06)
Income		.00 (.00)	.00 (.00)		.00 (.00)	.00 (.00)
Education		.06 (.04)	.06 (.04)		.04 (.05)	.04 (.05)
Family status <sup>b</sup>		-.09 (.05)	-.09* (.05)		-.16* (.06)	-.16* (.06)
Residence <sup>c</sup>		.02 (.04)	.02 (.04)		.02 (.06)	.02 (.06)
SRH		-.01 (.03)	-.01 (.03)		.10* (.04)	.09* (.04)
Physical limitations <sup>d</sup>		.08* (.04)	.08* (.04)		.08 (.05)	.08 (.05)
SWB T1		.66*** (.03)	.66*** (.03)		.62*** (.04)	.62*** (.04)
Age Discrimination X T1 SLE			-.21*** (.06)			.12 (.11)
$R$ ( $R^2$ )	.306 (.09***)	.709 (.50***)	.714 (.51***)	.213 (.05***)	.642 (.41***)	.642 (.41***)
$R^2$ increase from previous step		.41***	.01***		.37***	.00

Note: T1 = Time 1, 2008; T2 = Time 2, 2011; <sup>a</sup>1 = men, 2 = women; <sup>b</sup>1 = married, 2 = not married; <sup>c</sup>1 = Western Germany, 2 = Eastern Germany; <sup>d</sup>higher levels indicate fewer limitations; <sup>e</sup>1 = have not been discriminated against, 2 = have been discriminated against. SWB is the mean of the standardized scores of positive affect and satisfaction with life. SWB = subjective well-being; SRH = self-rated health; SLE = subjective life expectancy.

\*  $p < .01$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .



**Figure 2.** Three-way interaction of age discrimination with subjective life expectancy (SLE) and chronological age for predicting subjective well-being (SWB). Graphs present SLE  $\times$  Age Discrimination interaction for middle-age (40–64) and older adults (65–93). Low SLE represents scores 1 SD below the mean, high SLE represents scores 1 SD above the mean.

However, in their study, the authors compared the latter group to young, not middle-age adults. Rather, our results are consistent with the concept of middle age as a threshold into old age, entailing several age-related transitions. When coupled with a higher SLE, this time period might involve a higher vulnerability to signals of discrimination directed at older people, as one is less prepared for coping with them. Early evidence has shown that approaching older age involves a sharp, distressing recognition of the negative losses that are associated with aging in Western society (Bultena & Powers, 1978). Facing ageism might be one such 'formative', abrupt event. Unlike discrimination based on other categories of socially ascribed statuses (i.e. gender or ethnicity), discrimination due to age does not extend over the entire life-course, but begins after a certain point in one's lifetime. Middle age is perhaps the first phase in life where age-related discrimination becomes self-relevant and therefore, the most distressing. As the present results indicate, for individuals who hold higher SLE in this phase of life, facing age-related discrimination might serve as a 'rude awakening' that conflicts with self-perceptions of high longevity.

The expectation to live longer among middle-aged adults was associated with inferior SWB following experiences of perceived age discrimination. A higher expected longevity (or its variant, distance-to-death) is usually adaptive and a source of adjustment in later life (e.g. Shrira et al., 2014). Nonetheless, for middle-aged adults, a high SLE might prompt one to experience age-related events as 'off-time', because encountering age discrimination is incongruous with self-perceptions of one's future as expansive. Furthermore, perceived age discrimination can act as a cultural reminder of one's death (Bodner, 2009), which contrasts with a long perceived life expectancy. This might evoke more distress as, for middle-aged adults, approaching one's death was previously regarded as distant, and less tolerable. Indeed, studies that derive from terror management theory reveal that middle-aged adults show the highest levels of death-related anxiety, whereas older adults are less vulnerable (Maxfield et al., 2007), perhaps due to having experienced more reminders of their mortality, and having come to terms with it. In the same vein, the underside to this

explanation is also possible, which is that middle-aged individuals with a low SLE do not expect to live till a much older age, and therefore are less bothered by age discrimination.

The present findings should not be taken to mean that ageism does not leave its mark on older adults. Rather, our findings suggest that older adults internalize stereotypes in order to adapt to a society that is steeped in negative experiences relating to ageism (Levy, 2001). Of note, the rate of reporting age discrimination in this study was slightly higher among middle-aged than older adults (a rate of 11% versus 9%, a difference which was not statistically significant). This difference does not suggest that older adults are not actually exposed to less age discrimination, but that they have come to expect it, and are less sensitized to it. This interpretation is in line with previous studies on the influence of ageism. Nelson (2009), for instance, has shown that older adults are less likely than younger adults to recognize ageist treatment. For older adults, ageism can be thought of as an 'on-time' event, and its influence might manifest itself in more complex processes, such as adopting pessimistic expectations, and an acceptance of societal portrayals of older adults, with the associated negative beliefs one might hold about oneself as a member of an older age category (e.g. Donlon, Ashman, & Levy, 2005). While these might serve as a form of inoculation against the effects of further age discrimination, they have been shown to carry deleterious outcomes to one's health, cognitive abilities, functioning, and even mortality (e.g. Levy et al., 2002).

Some caveats should be noted. The data were drawn from self-report, potentially creating response biases and limiting the validity of our measures. It should also be noted that age discrimination was assessed with a single-item measure, perhaps not covering the full range of meanings of the experience of age-related discrimination. In the same vein, perceived discrimination is not synonymous with actual discrimination. Findings might have been different had we examined actual occurrences of discrimination. Furthermore, future studies are needed to understand what specific age-related experiences make middle age a critical turning point that heightens sensitivity to any perceived discriminatory experiences that relate to one's new age-status. These might



include the emptying nest, approaching retirement, or the onset of age-related medical conditions.

In sum, our findings show that earlier exposure to perceived age discrimination has divergent associations with SWB, depending not only on chronological age, but also on subjective expectations of longevity. Although middle-aged adults who expect to live longer are usually not considered socially vulnerable, the present results are relevant in warranting more awareness to possible discrimination and its aftermath among this age group.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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