Article

Sticks and Stones: Perceived Age Discrimination, Well-Being, and Health Over a 20-Year Period

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Abstract

This study examines associations between perceived day-to-day age discrimination, positive well-being, and physical health over a 20-year span. Data came from all three waves of the National Survey of Midlife Development in the United States (1995–2014). Generalized structural equation modeling was used to analyze 6,016 observations of 3,102 participants and test associations between age discrimination and (a) psychological well-being and positive affect, and (b) self-rated health, instrumental activities of daily living, and chronic conditions. Associations were also examined between the well-being measures and all three health outcomes. Between-persons and within-persons effects were modeled separately but simultaneously. Both between-persons and within-persons results revealed numerous significant associations between age discrimination and physical health, although results were stronger between-persons. Moreover, hypothesized associations of age discrimination with well-being, and of well-being with physical health, were supported both between- and within-persons. Findings suggest diminished well-being may be one mechanism whereby age discrimination harms health.

Keywords

ageism, longitudinal analysis, physical health, well-being

Perceived age discrimination has well-known negative effects on mental health (Ayalon, 2018; Shippee, Wilkinson, Schafer, & Shippee, 2019; Vogt Yuan, 2007). Further, age discrimination makes people feel lonely (Lee & Bierman, 2019) and badly about how they are aging, which leads to symptoms of depression (Han & Richardson, 2015). Discrimination on the basis of age is also often a new experience for people as they enter midlife and later life, so while the harms of other forms of discrimination are likely to accumulate steadily across the life course (e.g., Blank, 2005), age discrimination may be an emerging stressor—and one for which individuals have not yet developed effective coping mechanisms (e.g., Garstka, Schmitt, Branscombe, & Hummert et al., 2004; Stokes & Moorman, 2016).

However, most research on the mental health effects of age discrimination has confined itself to examining depressive symptoms and other forms of distress. Yet mental health is not simply the absence of mental illness and distress, and indeed, ill-being and well-being have distinct and differential impacts on physical and biological health (Ryff et al., 2006). Positive aspects of well-being can even serve as protective coping mechanisms, shielding individuals from the downstream harms of negative or discriminatory experiences (Cohen, 2004; Thoits, 2011). Further, like other types of discrimination, age discrimination may provoke neuroendocrine, inflammatory, or other biological responses that may affect aspects of physical health as well (Goosby, Cheadle, & Mitchell, 2018). Thus, age discrimination may prove harmful for aspects of well-being as well as for physical health in middle and older age.

In this study, we examine perceptions of age discrimination, well-being, and physical health in longitudinal data collected from over 3,000 people over a 19-year period. We have two aims. First, we seek to document associations between perceived age discrimination and aspects of psychological well-being and physical health. Second, we estimate both between-person and within-person effects to examine whether experiences of age discrimination, poor well-being, and poor physical health cluster among certain individuals in a stable fashion and/or whether experiencing age discrimination progressively erodes both well-being and physical health over time.

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Incidence of Age Discrimination

The U.S. federal government recognizes age as a protected category. It does not fund programs or activities that discriminate on the basis of age (Age Discrimination Act of 1975) and does not permit employers to make various decisions, namely in hiring and firing, about employees aged 40 years and older on the basis of age (Age Discrimination in Employment Act of 1967). Because of both the legal definition and the potential for personal financial losses, the workplace has been a common context to examine age discrimination. Both younger workers (i.e., under age 25 years) and older workers (i.e., over age 50 years) report the highest rates of age discrimination (Gee, Pavalko, & Long, 2007).

However, experiences of age discrimination *outside* the workplace are harder to define and measure, and there is no definitive statistic on the frequency of perceived age discrimination in community settings. Most of the major longitudinal studies use the Everyday Discrimination Scale (EDS) to measure age discrimination (Williams, Yu, Jackson, & Anderson, 1997). First, participants answer questions about how frequently they experience poor or unfair treatment (e.g., "You are treated with less courtesy or respect than other people") and encounter negative stereotypes or social exclusion (e.g., "People act as if you are not smart"). None of the items, notably, uses the word "discrimination." Next, participants who say that they ever have any of these experiences are asked "What do you think were the main reasons why these experiences happened to you?" They can select as many reasons as they wish from a list that includes "other." In the Health and Retirement Study, approximately 10% of people who experienced discrimination gave no attribution for it, and the average person chose two reasons from a list of 11 (Giasson, Queen, Larkina, & Smith, 2017). Therefore, reported statistics depend on a range of factors including how the researchers treat the frequency and attribution categories and how the participants interpreted the items. A recent psychometric study suggests that race, age, gender, and educational attainment all affect how people use the scale (Harnois, Bastos, Campbell, & Keith, 2019).

Given those caveats, one estimate from nationally representative data is that 11% of adults in midlife (i.e., aged 25–74 years) have experienced age discrimination (Vogt Yuan, 2007), and this figure rises to 30% of adults in their 80s (Giasson et al., 2017). Yet the United States may be somewhat less ageist than elsewhere, with perceived age discrimination reported more frequently in England, for example, than in the United States (Rippon, Zaninotto, & Steptoe, 2015). Notably, although age as a reported *reason* for perceived discrimination increases with age, older adults are less likely than younger adults to report experiencing discrimination overall (e.g., Gee et al., 2007; Stokes & Moorman, 2016).

Outcomes of Perceived Age Discrimination

The stress process model (Pearlin, Menaghan, Lieberman, & Mullan, 1981), alongside Cohen's (1988) identity and self-esteem model, provides a lens for understanding what happens after people perceive age discrimination. Discrimination is a psychosocial stressor, and unless personal coping or social support intervene, stress may impair physical health (Pascoe & Smart Richman, 2009). Its effects can be direct, via biological or neuroendocrine responses, or indirect, by way of negative psychological, affective, and behavioral responses to stress exposure (Cohen, 1988; 2004; Pearlin et al., 1981). Indeed, researchers have increasingly recognized the interplay of social, psychological, behavioral, and biological factors in determining health outcomes (e.g., Brondolo, Blair, & Kaur, 2018; Johnson & Acabchuk, 2018). The present study seeks to apply these theoretical insights to the unique psychosocial stressor of age discrimination and to examine its potential influences on psychological and physical health in adulthood.

Both the stress process model (Pearlin et al., 1981) and the identity and self-esteem model (Cohen, 1988) anticipate that the stress of discrimination may weaken the protective benefits of well-being. Perceived discrimination can undermine feelings of self-worth or esteem, by communicating to individuals that they do not belong or are not of value to a particular community (e.g., Stokes, 2019; Thoits, 2011). The extent to which discriminatory experiences undermine well-being may partially determine whether they undermine physical health, as well (Cohen, 1988; 2004; Pascoe & Smart Richman, 2009; Thoits, 2011). Positive affect and well-being have been associated with greater health-promoting behaviors as well as fewer deleterious health behaviors (Boehm & Kubzansky, 2012; Steptoe, Dockray, & Wardle, 2009).

Therefore, perceived age discrimination may have behavioral and biological implications for adults' physical health in addition to their well-being (Jackson, Hackett, & Steptoe, 2019; Marchiondo, Gonzales, & Williams, 2019; Vauclair et al., 2015). First, reductions in well-being may harm physical health. Positive affect in particular has been linked with reduced markers of inflammation, healthier neuroendocrine and cardiovascular activity, and lower incidence of stroke (Ostir, Markides, Peek, & Goodwin, 2001; Stellar et al., 2015; Steptoe, Wardle, & Marmot, 2005). Such effects are distinct and independent of those from ill-being (e.g., depression, negative affect), as well (e.g., Ostir et al., 2001; Ryff et al., 2006; Steptoe et al., 2005). There is evidence that perceived age discrimination specifically may erode individuals' sense of self-esteem, life satisfaction, and positive affect (Avidor, Ayalon, Palgi, & Bodner, 2017; Garstka et al., 2004; Vogt Yuan, 2007). However, these studies have largely been limited to cross-sectional analysis (e.g., Garstka et al., 2004; Vogt Yuan, 2007), while the sole longitudinal study (Avidor et al., 2017) was limited to two-wave data collected over a 3-year period among German adults.

Second, there is mounting evidence that age discrimination has direct consequences for adults' physical health, as well. These include not only cross-sectional associations of age discrimination with self-reported health (e.g., Jackson et al., 2019; Vauclair et al., 2015) but also longitudinal associations of age discrimination with later reports of self-rated health (Jackson

et al., 2019; Marchiondo et al., 2019) and incidence of serious health problems (Jackson et al., 2019). It is likely that these health effects of age discrimination function both through physiological stress response mechanisms (e.g., Pascoe & Smart Richman, 2009; Pearlin et al., 1981) and via impaired social cognition, reduced social capital, lack of trust, and the deleterious health behaviors that result from these and from diminished well-being (e.g., Brondolo, Blair, & Kaur, 2018; Chen & Yang, 2014). The present study builds upon this prior research by examining longitudinal associations of perceived age discrimination with multiple measures of well-being and physical health across three waves of data collected over a 19-year period from a national sample of midlife and older American adults.

Change Over Time, Differences Between Individuals

An advantage of longitudinal data is the ability to examine both differences between people and changes within people. That is, some people may perceive age discrimination while others do not, and some people who previously never experienced age discrimination may experience it as they age. Differences between people may be due to differential perception or to differential exposure. Some people, for example those who have more negative attitudes towards aging, may be more likely than others to notice discrimination (Giasson et al., 2017). Alternatively, some individuals may be truly more likely than others to experience age discrimination due to the social environments they occupy (e.g., workplace, neighborhood). Whether due to differential perception or exposure, those who have perceived discrimination are more likely to perceive it again in the future (Pavalko, Mossakowski, & Hamilton, 2003). Thus, it is possible that experiences of age discrimination, poor well-being, and poor health cluster among certain individuals but change little over time.

However, experiences of age discrimination increase in midlife (Gee et al., 2007), meaning some individuals who did not previously perceive age discrimination experience it as a new phenomenon in adulthood. Thus, it is possible that *changes* in exposure to age discrimination may associate with changes in adults' psychological and affective well-being and their physical health. From this perspective, the effects of age discrimination may accumulate: The perceived experience of age discrimination can undermine well-being (Avidor et al., 2017), harm one's physical health (Jackson et al., 2019), and may also increase the likelihood of perceiving age discrimination again in the future (Pavalko et al., 2003). Within-persons analysis allows for an examination of how change in perceiving age discrimination from one time to another associates with concomitant changes to well-being and health (Allison, 2009). Moreover, because within-persons models implicitly control for all stable between-persons factors that may lead to differential exposure and/or perceptions of age discrimination, they also protect against any potential overestimation of stressors' effects due to the presence of alternative causes not explicitly measured in the data (e.g., Lee & Bierman, 2019).

Focus of the Current Study

This study contributes to a literature that explores perceived age discrimination and health longitudinally across the decades of middle and later adulthood. We assess physical health using three measures that represent a broad range of physical impairments and that incorporate both subjective and objective appraisals of health status: self-rated health, limitations in instrumental activities of daily living, and number of chronic conditions. We also analyze measures of psychological well-being and positive affect to assess positive indicators of mental health, and we position well-being as a potential link between age discrimination with physical health. We pay special attention to the distinction between within-persons and between-persons effects, noting that both types of processes may occur. Our findings will contribute both empirically and theoretically to the literature on age discrimination and health and will help to identify mechanisms that link these both across individuals and over time.

Method

Data

Data for this study came from all three waves of the National Study of Midlife Development in the United States (MIDUS, 1995–2014). The MIDUS study began in 1995–1996 with a national probability sample of noninstitutionalized, English-speaking residents of the contiguous United States aged 25–74 years, selected via random digit dialing (Ryff et al., 2017). Follow-up interviews were conducted in 2004–2006 and 2013–2014. Respondents provided information through two instruments: phone interviews and self-administered questionnaires (Ryff et al., 2017). Since items of interest for this study were included in both instruments, the sample was restricted to respondents who completed both the phone interview and questionnaire.

A total of 3,034 individuals responded to both the phone interview and the questionnaire at Wave 1, while 1,805 individuals did so at Wave 2, and 1,177 did so at Wave 3. Although the majority of Wave 2 and Wave 3 participants responded to both the phone interview and questionnaire at the prior wave, participants were included in our subsample regardless of prior response patterns and attrition. Thus, 54 individuals completed both the phone interview and questionnaire for the first time at Wave 2, and 11 individuals did so for the first time at Wave 3. The final analytic sample for this study thus included 6,016 observations from 3,102 individuals across the three waves of MIDUS. Of these, 1,267 completed the phone interview and questionnaire at one wave, 756 completed them at two waves, and 1,079 completed them at all three waves.

Due to both the relatively long lags between data collection waves and the age range of participants, attrition over the 19-year study period was expected. In examining correlates of attrition, we found that respondents who participated at both Waves 1 and 2 reported significantly better self-rated health, fewer limitations in instrumental activities of daily living, and

greater psychological well-being than those who left the study before Wave 2. Further, those who returned at Wave 2 were significantly younger, more likely to be female, better educated, more likely to be White rather than Black or another race, and were more likely to be married rather than divorced/separated or never married than those who responded at Wave 1 but not at Wave 2.

Respondents who participated at both Waves 2 and 3—nearly all of whom participated at all three waves—reported significantly better self-rated health, fewer limitations with instrumental activities of daily living, more chronic conditions, greater psychological well-being, and greater positive affect, and were significantly younger, wealthier, and better educated than those who left the study before Wave 3. Additionally, participants who returned at Wave 3 were significantly more likely to be White rather than Black, more likely to be married and less likely to be widowed, and more likely to be employed and less likely to be retired than were those who responded at Wave 2 but did not return at Wave 3.

To examine the influence of selective attrition over time, we ran a sensitivity analysis that imputed data for cases that were missing at one or more waves. Data were assumed missing at random, and all variables included in the analysis were used in the imputation process (e.g., Johnson & Young, 2011). Results were very similar to those presented below, with only minor differences in coefficient significance found. Further details are reported in the Results section, and detailed results of this sensitivity analysis are available from the authors upon request.

Measures

Health outcomes

Self-rated health. Self-rated health was a single-item measure ranging from 1 (*poor*) to 5 (*excellent*) and was treated as an ordinal outcome.

Instrumental activities of daily living. Participants were asked how much their health limited them in performing seven instrumental activities of daily living such as "lifting groceries" and "climbing several flights of stairs." Response options ranged from 1 (*not at all*) to 4 (*a lot*), and the raw scale was constructed as a mean-score scale. Due to significant skew, limitations with instrumental activities of daily living were recoded as an ordinal measure with categories for 0 (*not at all*), 1 (*more than not at all* to *some*), and 2 (*more than some* to *a lot*).

Chronic conditions. Chronic conditions was measured as a summary scale of the number of chronic conditions participants reported having in the past 12 months out of a list of 39 options such as diabetes, stroke, and back problems (e.g., sciatica, lumbago, backaches). Due to significant skew, chronic conditions was recoded as an ordinal measure with categories for 0 (*no chronic conditions*) through 9 (*nine or more chronic conditions*).

Well-being measures

Psychological well-being. Psychological well-being was measured using an 18-item scale (Ryff & Keyes, 1995). Additional questions concerning psychological well-being were added to the MIDUS study at Wave 2; however, the set of Wave 1 items was used in this study for consistency and comparability across waves. Response options ranged from 1 (*strongly disagree*) to 7 (*strongly agree*) and were coded such that higher values indicated greater well-being. Psychological well-being was generated as a mean-score scale ($\alpha = .82$). The scale was set to missing if fewer than half of the scale items were answered.

Positive affect. Positive affect was measured using a 6-item scale (Mroczek & Kolarz, 1998). Participants were asked how often they experienced feelings such as "cheerful" and "full of life" over the past 30 days, with response options ranging from 1 (*none of the time*) to 5 (*all of the time*). Positive affect was generated as a mean-score scale ($\alpha = .91$) and coded such that higher values indicated greater positive affect. The scale was set to missing if fewer than half of the scale items were answered.

Discrimination

Age discrimination. Participants were asked to answer a series of nine questions concerning how often, ranging from 1 (*never*) to 4 (*often*), they experienced different forms of day-to-day discrimination (Williams et al., 1997). Sample items include "[How often] are you treated with less courtesy than other people?" and "[How often do] people act as if they think you are not as good as they are?" After answering these questions, participants were then asked what the main reason(s) were for the discrimination experienced and given a list of 10 options (including "other, please specify"). Respondents were allowed to select all reasons they believed applied. Participants who reported some level of day-to-day discrimination and selected age as a reason for experienced discrimination were coded as having *experienced age discrimination*, regardless of whether they selected additional reasons for experiencing discrimination as well. Participants who reported some level of day-to-day discrimination but did *not* select age as a reason were coded as having *experienced other discrimination*. This included those who did not select *any* reason for reported discrimination. The reference group comprised participants who did not report any day-to-day discrimination, who were coded as having *experienced no discrimination.*

Previous studies of age discrimination have typically employed this same coding schema (e.g., Gee et al., 2007; Giasson et al., 2017; Jackson et al., 2019; Rippon et al., 2015; Vogt Yuan, 2007). This is due in part to the relative infrequency of age being selected as the *only* reason for discrimination (3.3% of observations in the present data). Moreover, those who experience age discrimination for the first time in midlife and later life have often previously experienced—and continue to experience—discrimination on the basis of other characteristics such as race or gender. Those who report age as the only reason for discrimination are likely to be a unique and unrepresentative subset of the population that experiences age discrimination. For instance, although the subsamples were fairly small in our data ($n = 201$ and 304,

respectively), those who reported age as the only reason for discrimination were significantly more likely to be male rather than female, and to be White rather than Black, when compared with those who reported age as one of multiple reasons for perceived discrimination. One recent study did use a direct measure of perceived age discrimination rather than a multi-item inventory (Avidor et al., 2017), yet it was limited to a single-item self-report that did not incorporate information on other potential attributions for discrimination (i.e., this study also coded age discrimination without respect to other potential reasons for perceived discrimination). Therefore, we categorize all participants who selected age as a reason for perceived discrimination as having *experienced age discrimination*. A sensitivity analysis separating those who reported age as one of multiple reasons for discrimination and those who reported age as the only reason for discrimination is provided as Supplemental Table 3.

Covariates. To ensure the validity of results, covariates were included in the analysis to protect against the risk of confounding. *Age* was coded as a continuous variable, in years. Education was measured using dichotomous indicators for *less than high school*, *high school degree*, *some college* (reference), *bachelor's degree*, and *education beyond college.* Marital status was measured using dichotomous indicators for *married* (reference), *divorced or separated*, *widowed*, and *never married*. Parental status was measured using a dichotomous indicator for whether an individual *has children*. Employment status was measured using dichotomous indicators for *employed* (reference), *retired*, and *not employed*. *Neuroticism* was measured using a 4-item mean-score scale ($\alpha = .73$) ranging from 1 (*lowest*) to 4 (*highest*; Lachman & Weaver, 1997). *Social integration* was measured using a 3-item mean-score scale ($\alpha = .77$) ranging from 1 (*lowest*) to 7 (*highest*; Keyes, 1998). *Income* was self-reported in reference to the previous year and was standardized at each wave for comparability across waves. Additionally, time-invariant covariates included measures for the personal characteristics of gender and race. Gender was measured using a dichotomous indicator for *female*. Race was measured using dichotomous indicators for *White* (reference), *Black*, and *other race*.

Analytic Strategy and Missing Data

The majority of cases (84%), excluding those lost to attrition, had complete data for all measures included in the analysis. The item with the greatest amount of missingness was income, for which 11.5% of valid cases were missing data. Missing data diagnostics did not reveal any clear patterns. Thus, missing data were addressed by multiple imputation using Bayesian estimation (Muthén & Muthén, 2017). A total of five data sets were generated, and coefficients were combined using Rubin's (1987) rules. Results of an analysis using listwise deletion were similar to those presented here.

We estimated a multilevel generalized structural equation model (GSEM) in Mplus 8.3 to address our research questions. This allowed for (1) simultaneous estimation of multiple outcomes, which (2) were allowed to covary with one another. It also allowed for (3) multiple intermediary variables, which (4) were also allowed to covary with one another. Theory places positive well-being as one of the mechanisms by which age discrimination may affect physical health (e.g., Cohen, 1988, 2004; Stellar et al., 2015). Although our data are not suited to a formal test of causal mediation, we believe that conceptually this is the appropriate specification of the model.

Due to the noncontinuous nature of our health outcomes, we used a robust weighted least squares estimator in our model. Between-persons and within-persons effects were estimated simultaneously. The use of within-persons modeling has the added advantage of implicitly accounting for all stable person-level sources of confounding, whether measured or unmeasured in the data (e.g., Allison, 2009; Lee & Bierman, 2019. By definition, the time-invariant covariates (gender, race) were included as controls at the between-persons level only. For the time-invariant control measures, variables with between-persons and within-persons effects that were not significantly different from one another had their coefficients constrained to equality. These constraints did not alter any significant findings of interest and generated sufficient degrees of freedom to estimate model fit statistics. Between-persons and within-persons coefficients for discrimination and the well-being measures were not constrained to equality, irrespective of the significance of differences in the coefficients.

Results

Descriptive Statistics

Approximately 38% of observations lacked any perceived discrimination at all, in keeping with previous studies of U.S. adults (e.g., Giasson et al., 2017). Among those who did report discrimination, such experiences remained fairly infrequent: Average levels of perceived discrimination among both those who experienced age discrimination and those who experienced discrimination for other reasons were less than "rarely" (mean = 1.79 and 1.69 on the 1–4 scale, respectively). Among those who experienced discrimination, 14% ($n = 505$) included age as a reason for discrimination, while 86% ($n = 3{,}213$) did not. Of those who reported age as a reason for discrimination, 40% ($n = 201$) reported age as the *only* reason for such discrimination, while 60% ($n = 304$) listed age alongside other reasons for discrimination. Notably, those who listed age as the only reason for discrimination also reported lower levels of perceived discrimination than those who listed age as one of multiple reasons for discrimination (mean = 1.58 and 1.93, respectively).

Across the three discrimination groups, the most common report of self-rated health was either "good" (age discrimination) or "very good" (other discrimination; no discrimination), the most common report concerning instrumental activities of daily living was "a little limited" (all three groups), and the most common number of chronic conditions was between 0

(other discrimination; no discrimination) and 2 (age discrimination). Moreover, all three discrimination groups averaged between 5.26 and 5.59 on the 1–7 psychological well-being scale and between 3.22 and 3.51 on the 1–5 positive affect scale. Descriptive statistics for all measures are reported in Table 1. Information on these measures at each wave can be found in Supplemental Table 1.

Between-Persons Results

Table 2 presents the results of interest from our multilevel GSEM analysis. A full results table including all covariates is provided as Supplemental Table 2. Results at the between-persons level revealed a variety of associations between experiences of age discrimination, well-being, and physical health. First, people who perceived age discrimination also reported worse psychological well-being ($B = -.17$, $p < .001$) and lower positive affect ($B = -.17$, $p < .001$) than people who did not experience discrimination. Additionally, total effects (i.e., direct + indirect effects) of age discrimination were significant for self-rated health ($B = -.51$, $p < .001$), limitations with instrumental activities of daily living ($B = .69$, $p < .001$), and chronic conditions ($B = .72$, $p < .001$), indicating that individuals who reported age discrimination also reported worse physical health, accounting for both well-being and all measured covariates.

Within-Persons Results

Results at the within-persons level revealed significant associations among individuals' own trajectories of age discrimination, well-being, and health, as well. Wave-to-wave changes in age discrimination were significantly associated with diminished psychological well-being ($B = -.08$, $p < .05$) and reduced positive affect ($B = -.10$, $p < .05$). Further, age discrimination was associated with increased limitations with instrumental activities of daily living (total effect: $B = .34$, $p < .01$), and number of chronic conditions (total effect: $B = .18$, $p < .05$).

Attrition Analyses

To protect against potential bias from selective attrition, we performed a sensitivity analysis that imputed data for cases missing at one or more waves (see "Data" above). Results were very similar to those presented here. All of the significant total effects of age discrimination on physical health reported here were also significant in the sensitivity analysis. Additionally, while the direct between-persons association of age discrimination with self-rated health was attenuated to nonsignificance in the sensitivity analysis, the direct within-persons association of age discrimination with number of chronic conditions *became* significant. Further, the between-persons association of age discrimination with psychological well-being remained significant, but the within-persons association was not significant in the sensitivity analysis. The significant between-persons and within-persons associations between age discrimination and positive affect remained, as did all other significant associations of interest between age discrimination and health.

Discussion

The present study sought to explore associations between perceived age discrimination, positive aspects of well-being, and physical health over a two-decade span among adults in midlife and later life. In keeping with our theoretical expectations, age discrimination was associated with poorer well-being and worse physical health at both the between-persons and within-persons levels. We discuss the relevance of these findings for theory and future research concerning aging, discrimination, and health.

Incidence of Age Discrimination

In keeping with other recent studies of age discrimination among U.S. adults (e.g., Giasson et al., 2017), we found that the majority of participants (62%) reported some level of day-to-day discrimination and that 8% of participants experienced discrimination on the basis of age. However, it should be noted that levels of perceived discrimination remained quite low even among those who experienced it. Indeed, only 21% of participants who experienced discrimination averaged more than "rarely" on the 9-item EDS inventory. Moreover, age discrimination did not occur in isolation: Of those who experienced discrimination on the basis of age, the majority (60%) attributed their discrimination to one or more additional reasons, as well.

Between-Persons Differences

We hypothesized that experiences of age discrimination, poor well-being, and poor physical health might be clustered among some persons rather than others. Between-persons effects test this possibility, and the findings offered clear support. Perceived age discrimination was linked with all three measures of physical health as well as both measures of well-being, which were in turn each linked with one or more of the physical health outcomes. These results indicate that personalities and/or environments are relatively stable over time, such that experiences of—and vulnerability to—age discrimination are as well.

There are traits such as neuroticism (Bryant et al., 2016) or low openness and agreeableness (Allan, Johnson, & Emerson, 2014) that relate to one's beliefs about age and aging. Additionally, some settings may subject individuals to more age discrimination than others, as the likelihood of experiencing age discrimination depends in part upon whom one is exposed to on a regular basis (e.g., Stokes & Moorman, 2016). It seems most likely that both processes are at work: Between-persons differences in perceived age discrimination are a function of person–environment fit. Personality and other individual

Table 1. Descriptive Statistics, National Study of Midlife Development in the United States, 1995–2014.

Variables	Age Discrimination ($n = 505$) Mean (*SD*) or %	Other Discrimination ($n = 3{,}213$) Mean (*SD*) or %	No Discrimination ($n = 2{,}298$) Mean (*SD*) or %
Self-rated health			
Poor	5.16%	4.02%	3.66%
Fair	16.67%	11.99%	10.75%
Good	39.29%	34.44%	31.82%
Very good	30.16%	36.28%	35.44%
Excellent	8.73%	13.27%	18.33%
IADL limitations			
Not at all limited	18.02%	27.13%	30.33%
A little limited	44.16%	44.86%	44.14%
Somewhat to very limited	37.82%	28.00%	25.52%
Chronic conditions			
Zero	14.65%	20.41%	24.28%
One	14.85%	18.72%	20.76%
Two	15.84%	16.69%	18.74%
Three	15.45%	13.54%	12.34%
Four	10.10%	9.94%	8.30%
Five	7.13%	6.53%	5.84%
Six	6.34%	4.19%	3.12%
Seven	4.16%	3.03%	2.19%
Eight	3.17%	1.94%	1.71%
Nine or more	8.32%	5.00%	2.72%
Psychological well-being	5.26 (0.82)	5.42 (0.80)	5.59 (0.76)
Positive affect	3.22 (0.74)	3.32 (0.74)	3.51 (0.70)
Age	54.12 (14.17)	51.49 (14.21)	56.06 (14.42)
Gender			
Female	51.29%	55.46%	50.57%
Male	48.71%	44.54%	49.43%
Race			
White	90.89%	83.94%	92.60%
Black	4.55%	8.96%	1.83%
Other race	4.55%	7.10%	5.57%
Education			
Less than high school	8.91%	7.63%	8.75%
High school degree	27.72%	26.15%	30.13%
Some college	31.68%	31.47%	27.86%
College degree	17.23%	18.35%	18.42%
Some education beyond college	14.46%	16.39%	14.85%
Marital status			
Married	62.57%	62.23%	69.39%
Divorced/separated	19.80%	19.41%	14.41%
Widowed	7.52%	6.54%	9.88%
Never married	10.10%	11.81%	6.31%
Parental status			
Has children	86.34%	82.60%	87.42%
No children	13.66%	17.40%	12.58%
Employment status			
Employed	52.98%	58.04%	49.61%
Retired	22.18%	18.02%	26.63%
Not employed	24.85%	23.95%	23.76%
Neuroticism	2.27 (0.64)	2.23 (0.66)	2.07 (0.63)
Income (standardized)[a]	−0.11 (0.95)	0.04 (0.97)	−0.03 (1.05)
Social integration	4.51 (1.44)	4.68 (1.41)	4.94 (1.35)
Data collection wave			
Wave 1	45.94%	50.58%	51.22%
Wave 2	34.85%	30.25%	28.59%
Wave 3	19.21%	19.17%	20.19%

Note. $N = 6{,}016$ observations from 3,102 individuals.

[a] Income was reported in U.S. dollars by participants. However, response values varied across waves; therefore, within-wave standardized values were used for analysis and are presented here.

Table 2. Analysis of Age Discrimination, Well-Being, and Health Over Two Decades.

	PWB *B* (*SE*)	Positive Affect *B* (*SE*)	Self-Rated Health *B* (*SE*)	IADL *B* (*SE*)	Chronic Conditions *B* (*SE*)
Between-persons results					
Direct effects					
Psychological well-being	—	—	.36*** (.08)	−.45*** (.09)	−.15* (.07)
Positive affect	—	—	.79*** (.10)	−.59*** (.10)	−.73*** (.08)
Age discrimination[a]	−.17*** (.05)	−.17*** (.04)	−.32** (.12)	.52*** (.13)	.58*** (.10)
Other discrimination[a]	−.08** (.03)	−.09** (.03)	−.13* (.06)	.25** (.07)	.23*** (.06)
Indirect effects					
Age discrimination[a] → Psychological well-being			−.06** (.02)	.08** (.03)	.03 (.01)
Age discrimination[a] → Positive affect			−.13** (.04)	.10** (.03)	.12*** (.04)
Total effects					
Age discrimination[a]			−.51*** (.12)	.69*** (.14)	.72*** (.11)
Within-persons results					
Direct effects					
Psychological well-being	—	—	.12* (.05)	−.19*** (.05)	−.08 (.04)
Positive affect	—	—	.23*** (.04)	−.22*** (.04)	−.28*** (.04)
Age discrimination[a]	−.08* (.04)	−.10* (.04)	−.06 (.09)	.31** (.11)	.15 (.08)
Other discrimination[a]	−.08** (.02)	−.07** (.02)	.06 (.06)	.20** (.07)	.11* (.05)
Indirect effects					
Age discrimination[a] → Psychological well-being			−.01 (.01)	.02 (.01)	.01 (.00)
Age discrimination[a] → Positive affect			−.02* (.01)	.02* (.01)	.03* (.01)
Total effects					
Age discrimination[a]			−.09 (.09)	.34** (.11)	.18* (.09)
Model fit					
χ^2 square; *df*			17.40; 24		
CFI			1.00		
RMSEA			0.00		

Note. $N = 6{,}016$ observations from 3,102 individuals. All within-person models were adjusted for participants' education, marital status, parental status, employment status, income, neuroticism, and social integration. Between-persons models were further adjusted for gender and race. RMSEA = root mean square error approximation.

[a]Reference group is no discrimination.

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

characteristics likely interact with the physical and social characteristics of an environment to result in each person's usual daily experience (Mroczek & Almeida, 2004; Perry, Dokko, & Golom, 2012).

Change Over Time

The within-persons results examine the extent to which *changes* in experiencing age discrimination may correlate with changes in both well-being and physical health reports. That is, does age discrimination progressively erode well-being and health for individuals over time? Findings were somewhat weaker at the within-persons level than at the between-persons level, cohering with prior research in this area (e.g., Lee & Bierman, 2019), yet the results offered some support for this framework. Experiencing age discrimination was directly linked with declines in both psychological well-being and positive affect as well as with increases in limitations with instrumental activities of daily living. In turn, reduced positive affect in particular was associated with declines in self-rated health, increased limitations in activities of daily living, and a greater number of chronic conditions (Chida & Steptoe, 2008; Steptoe et al., 2009). Overall, the total effect of age discrimination on physical health was significant for two of the three physical health outcomes at the within-persons level, indicating that changes in experiencing age discrimination led to contemporaneous declines in physical health, with positive affect appearing as a potential pathway for these associations. (e.g., Steptoe et al., 2009).

These results are consistent with evidence linking perceived age discrimination to depressive symptoms and lower positive affect (Han & Richardson, 2015; Shippee et al., 2019; Vogt Yuan, 2007) as well as to negative perceptions of one's own aging process (Giasson et al., 2017; Han & Richardson, 2015). Findings were also consistent with theorizing on stress exposure and physical health: Age discrimination is a psychosocial stressor, which over time wears down individuals' psychological, emotional, and social coping resources, leading to riskier health behaviors and subsequent harms to health (Boehm & Kubzansky, 2012; Brondolo et al., 2018; Cohen, 2004; Pearlin et al., 1981; Steptoe et al., 2009; Thoits, 2011).

The Role of Positive Well-Being

In keeping with theoretical approaches to stress and health (e.g., Cohen, 1988, 2004; Pearlin et al., 1981), our findings

suggest that positive well-being may be an important pathway linking perceived age discrimination with physical health, both across individuals and over time. Distinct from negative aspects of mental health (e.g., depression), positive well-being is a key contributor to health in its own right, often serving as a protective coping mechanism that safeguards individuals from the potential harms of stressors such as discrimination (Cohen, 2004; Ryff et al., 2006; Thoits, 2011). Positive affect was consistently associated with better physical health in our analyses, but psychological well-being was also part of significant associations, particularly at the between-persons level. The connection between perceived age discrimination and poor well-being is well-established (e.g., Shippee et al., 2019; Vogt Yuan, 2007) as is the link between well-being and physical health (Boehm & Kubzansky, 2012; Chida & Steptoe, 2008; Steptoe et al., 2009). Ours is among the first investigations to join these associations to one another, providing information about the potential ramifications of age discrimination for health over time.

Because reports of age discrimination, well-being, and physical health are contemporaneous, these results are not a formal test of mediation nor of causality. However, they offer support for theoretical frameworks that position positive aspects of well-being as a mechanism linking social experiences with physical health outcomes (Cohen, 1988, 2004; Thoits, 2011). Indeed, age discrimination is a psychosocial stressor, damaging individuals' psychological and emotional well-being (e.g., Cohen, 1988; 2004; Pearlin et al., 1981; Shippee et al., 2019). These aspects of well-being, in turn, are coping mechanisms or protective factors that can reduce the negative impacts of various external stressors, in part by promoting better health behaviors; their deterioration may thus lead to physical health problems later in the life course (e.g., Boehm & Kubzansky, 2012; Brondolo et al., 2018; Cohen, 2004; Steptoe et al., 2009; Stokes, 2019; Thoits, 2011). Significant indirect effects found at both the between-persons and within-persons levels underscore the validity of this pathway as a potential mechanism linking social interactions with health outcomes in later life, which is deserving of further research attention in data sets better able to test causality.

Limitations

This study is limited in several key ways. First, our data—although longitudinal—rely on contemporaneous reports of perceived age discrimination, well-being, and health. We therefore rely primarily on theory for determining causal order and cannot establish causality via temporal ordering of variables, particularly given the 9-year lags between data collection waves. That the within-persons results revealed significant direct and indirect associations despite the length of time between data collection waves underscores the robustness of associations among these constructs, however.

Second, the measure of age discrimination used in this study was limited. Although standard in research using MIDUS data (e.g., Vogt Yuan, 2007), the age discrimination measure does not isolate discrimination on the basis of age from experiences of discrimination due to other reasons because most persons attribute their discrimination to multiple characteristics. Indeed, even discrete experiences of discrimination may be attributable to multiple, overlapping social characteristics. Moreover, recent evidence suggests the EDS may not be comparable across sociodemographic groups (Harnois et al., 2019). Future research seeking to compare age discrimination with other reasons for discriminatory treatment will require more refined measures for analysis.

Lastly, we cannot test in the present data whether psychological well-being and positive affect impact health directly through physiological responses and/or indirectly through health behaviors (e.g., Boehm & Kubzansky, 2012; Brondolo et al., 2018; Cohen, 1988, 2004; Pearlin et al., 1981; Steptoe et al., 2009). Future research incorporating physiological biomarker data collected over an extended time frame will be needed to address that question.

Conclusion

Perceived discrimination in general can be harmful for adults' mental and physical health (Luo, Xu, Granberg, & Wentworth, 2012; Pascoe & Smart Richman, 2009; Shippee et al., 2019; Vogt Yuan, 2007). Yet little is known about the long-term repercussions of day-to-day age discrimination, specifically, for physical health. The present study examined associations between perceived age discrimination, well-being, and health over the course of two decades. Additionally, this study compared between-persons and within-persons results in order to determine the extent to which these associations reflected interpersonal differences or intrapersonal changes over time. Findings revealed significant associations between perceived age discrimination and poorer well-being and physical health. Results were somewhat stronger for between-persons (i.e., interpersonal) than within-persons (i.e., intrapersonal) effects, yet both sets of findings offered support for our hypotheses: Age discrimination is harmful for health, perhaps in part due to its negative impact(s) on psychological well-being and, especially, positive affect. Future research should further examine links between age discrimination and physical health, using more refined measures of age discrimination along with use of longitudinal data on health behaviors, well-being, and physiological biomarkers. Such research will help to further clarify ways in which age discrimination may get "under the skin" and harm health in midlife and later life.

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Supplemental Material

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