The Role of Self-Efficacy in the Variation of Health Outcomes Late in Life

by

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Abstract

As the population of the United States ages, variation in late-life health and wellbeing outcomes have become an increasingly popular and necessary area of scientific exploration. Previous research has identified ageism (Levy et al., 2000) and perceived age discrimination (Han & Richardson, 2015; Marquet et al., 2019) as factors that negatively impact outcomes for older adults. Further, as conceptualized through the Stereotype Embodiment Theory (Levy, 2009), self-perceptions of aging have been found to mediate the influence of perceived age discrimination on health outcomes. Individuals from stigmatized groups have a physiological reaction (i.e., a stress response) to negative age stereotypes (Levy et al., 2000) and other forms of discrimination (Lui & Quezada, 2019). Therefore, analyzing the Stereotype Embodiment Theory and Transactional Model of Stress (Lazarus & Folkman, 1987) in combination allows one to consider the variation of aging outcomes as subject to individual factors involved in stress appraisal and coping. The current study utilized public data from 676 older adults who participated in two waves of the Health and Retirement Study (2012; 2016). First, conditional process analysis was employed to confirm self-perceptions of aging as a mediator between perceived age discrimination and outcomes. Next, the potential protective effects of self-efficacy in the stress appraisal process were explored. Results confirmed the indirect effect of perceived age discrimination on health outcomes and life satisfaction through self-perceptions of aging.

However, the analysis did not provide evidence for self-efficacy's moderating effect on the relationship between perceived age discrimination and self-perceptions of aging. This study provides additional support for the Stereotype Embodiment Theory and offers individual differences in stress appraisal as an explanation for variation in late-life wellness.

Keywords: ageism, perceived age discrimination, self-efficacy, health outcomes, life satisfaction

Chapter I

Introduction

Adults aged 65 years and older are a rising population in the United States. The U.S. Census Bureau estimates that aging adults comprise approximately 16.5% of the American population which is predicted to grow to 23.4% by 2060. These shifting age demographics have weighty implications for the future of healthcare, the economy, and the wellbeing of families and individuals. According to Dall et al. (2013), this "graying of America" means that more citizens will have access to healthcare through Medicare, increasing the need for primary care by as much as 14% by 2025. Furthermore, with aging comes increased risk for chronic disease requiring specialized care that can be extremely expensive to treat. Recent data on healthcare expenditures in the U.S. show that care for aging adults is, on average, three times as costly as that of younger adults (*Centers for Medicare & Medicaid Services*, 2020). Additionally, as the country ages, the worker to retiree ratio will begin to decrease resulting in a larger number of citizens drawing from, rather than paying into, Social Security (Thompson, 2012). Families will also be impacted as middle-aged adults will be faced with caregiving responsibilities for both their children and aging parents (*The Graying of America*, 2018). Therefore, focusing efforts on the health and quality of life for the aging population can buffer consequences at the societal, family, and individual level.

Among the aging population there is wide variability in outcomes. Therefore, biopsychosocial researchers are interested in identifying factors that can lead to a healthy and positive aging experience. One of the factors that has been subject of exploration is *age*

discrimination; the phenomenon of discrimination toward individuals based on chronological age. Previous research has provided evidence that those who experience age discrimination react with a physiological stress response (Levy et al., 2000) which provides some insight into its impact on health outcomes. However, age discrimination alone cannot explain inconsistencies in aging outcomes. Individual level factors interact with environmental stressors to produce variability in outcomes (Lazarus & Folkman, 1987). The current study aims to build on previous research that explores the relationships between perceived age discrimination (PAD), self-perceptions of aging (SPA), and aging outcomes (i.e., health outcomes and life satisfaction). Further, individual self-efficacy is explored as a potential protective factor against the internalization of age discrimination.

Review of two theories helps to pave the path for the current study. First, Stereotype Embodiment Theory (Levy, 2009) suggests that ageism negatively impacts health outcomes through self-perceptions of aging. The theory posits that individuals internalize negative age stereotypes throughout their lives, which then become more salient in old age. Internalized ageism then manifests as negative attitudes towards one's own aging called *self-perceptions of aging* (Levy, 2009). SPA are then evidentially associated with various outcomes late-in-life including links with health behaviors (Whitehead, 2017), mental health (Marquet et al., 2019), dementia (Levy et al., 2018), and number of hospital stays (Sun & Smith, 2017). Since aging is inevitable, age discrimination is likely something all individuals will face at some point in their lives. Continued scientific exploration of the biopsychosocial factors that impact and are impacted by age discrimination, helps practitioners to identify opportunities for prevention and intervention efforts.

Second, viewing Stereotype Embodiment Theory through the lens of the Transactional Stress Model (Lazarus & Folkman, 1987), may provide insight into underlying mechanisms involved in the development of negative SPA, as well as their impact on health outcomes and life satisfaction late in life. The Transactional Stress Model suggests that outcomes flow from an interaction (i.e., *transaction*) between person and environment followed be a series of cognitive appraisals. Individuals are faced with environmental stressors for which they initiate a cognitive process (i.e., *primary appraisal*) to consider whether or not the stressor presents a threat to their overall wellbeing and ability to achieve personal goals. Several individual level variables affect the outcome of primary appraisal including one's values, beliefs, attributional styles, and levels of self-efficacy. Next, if the stressor is evaluated as threatening, an individual considers their coping options during a secondary appraisal. Once again, individual level variables affect whether and what kind of coping strategies are implemented. This process for appraising and coping with a stressor then influences short-term outcomes like emotions and affect, along with long-term outcomes such as health, wellbeing, and social functioning (Lazarus & Folkman, 1987). It is proposed here that, perceived age discrimination represents an environmental stressor for aging adults that elicits varying outcomes conditional upon individual level factors that are involved in the stages of stress appraisal.

Individual psychosocial factors such as self-efficacy create variation in the result of primary and secondary appraisals from person to person. *Self-efficacy* is often thought of as a construct of psychological wellbeing and generally refers to one's perceived level of capability to carry out and engage in the activities of daily living (C. D. Ryff, 1989). Self-efficacy can also be broken down into more domain specific capabilities (e.g., health efficacy) and may mean different things across one's lifespan. For example, as a child or adolescent, general self-efficacy

may be more grounded in academic achievement and social interactions with peers whereas later in life, it is more influenced by one's ability to manage life independently. According to Bandura's theory of self-efficacy, the behaviors and cognitive processes of individuals are shaped by one's experience of their competence as well as how they perceive others to judge their performance (Fasbender & Gerpott, 2020). Because many age-based stereotypes target competence, it is reasonable to postulate that self-efficacy may play a role in the relationships between PAD, SPA, and health outcomes. In fact, previous exploration provided evidence of self-efficacy as a mediator in the relationship between SPA and health outcomes (Tovel et al., 2019). However, self-efficacy's role in primary appraisal and possible moderating effects on the relationship between PAD and SPA have not been studied.

A Historical Perspective on Ageism

To better understand PAD as a source of stress, the historical context and theories of ageism should be reviewed. Ageism is a fairly recent phenomenon, potentially resulting from the modernization of society. In generations past, elders served as historians in their communities, an important role prior to the printing press. Attitudes toward aging continued to shift with the start of the industrial revolution in which work required certain physical capabilities. The introduction of new technologies led to the demotion of older adults in the social hierarchy (Nelson, 2005). According to the Stereotype Content Model, people organize one another into groups within the context of a social hierarchy (Cuddy et al., 2005). Higher ranked individuals are viewed as more competitive in securing resources (i.e., employment, education, financial) whereas lower ranked individuals are seen as non-threatening. It is suggested that categorization is determined on two dimensions, warmth and competence. As one's perception of a group rises on one dimension, it falls on the other (Cuddy et al., 2005). In other words, as perception of warmth increases, that of

competence decreases. Those with a higher social status are seen as more competitive and competent therefore lacking warmth, whereas those lower in the hierarchy, such as the elderly, are perceived to be less competent but more sympathetic.

These perspectives help us understand why people hold negative age stereotypes. However, examining how negative beliefs about aging adults (i.e., ageism) translate into discriminatory behaviors (i.e., age discrimination) assists in understanding the experience as a chronic stressor able to impact health outcomes.

Ageism and Health Outcomes

Ageism appears to impact outcomes for aging adults both directly and indirectly. Previous research suggests that exposure to negative age stereotypes elicits a physiological stress response for older adults. Levy et al. (2000) conducted a laboratory study in which participants aged 62-82 years old were randomly assigned to either a positive or negative age stereotype group. Participants completed baseline questionnaires and were then exposed to subliminal presentations of age stereotypes (positive for one group, negative for the other) used as primers prior to completion of two sets of mathematical and verbal challenges. Physiological measures such as blood pressure, heartrate, and skin conductance were recorded at baseline, after priming, and after completion of the challenges. When compared to participants in the positive age stereotype group, those in the negative condition showed increased physiological reactivity to the prime for all measures except for heartrate. Participants' physiological reactivity to negative age stereotypes provides evidence that individuals experience ageism as stressful. Because ageism is so pervasive in our society, it could reasonably be assumed that it is experienced as a chronic stressor for some. Chronic stress and continual activation of the autonomic nervous system can increase risk for cardiovascular and other inflammatory diseases (Straub, 2017). This also

implies that, for those with existing cardiovascular conditions, repeated ANS activation in response to ageism as a chronic stressor may increase risk for cardiac events.

So why is ageism stressful? One possible explanation is referred to as stereotype threat. In order for discrimination to negatively impact an individual, they must first acknowledge that they belong to the stigmatized group and be faced with a situation in which they risk validating the negative stereotypes (Lamont et al., 2015). Previous experimental research has provided evidence of this effect on older adults' cognitive performance, which is often the target of negative stereotypes (e.g., "senior moment"). In a meta-analysis, Armstrong et al. (2017) explored how age-based stereotype threat effected both working and episodic memory in older adults. Various methods of inducing stereotype threat were utilized across both memory types, but interestingly they found that working memory was most affected when more subtle inductions were utilized. The researchers speculate that when it is less clear to the participant that they are being stigmatized, it consumes cognitive energy needed for performance on the task at hand.

Further, as stereotype threat suggests, when individuals experience decreased performance as a result of age discrimination, they risk validating stereotypes. One study examined the perceived status of older adults across eight different countries. Age status essentially represented where participants perceived older adults to fall in the social hierarchy in their country. Cognitive performance data was then analyzed from older adult participants from the eight countries. Statistical analysis revealed a significant relationship between age status and cognitive performance. Individuals from countries in which citizens ranked older adults' status as higher performed better on immediate recall, delayed recall, and verbal fluency tasks. Those from countries that ranked older adults lower did not perform as well (Smith et al., 2018).

Directionality cannot be confirmed from the study. However, if one was to hypothesize that older adults' social status was the cause of their cognitive performance, this may provide evidence of a self-fulfilling prophecy effect. Further, it would suggest that individuals in more ageist communities are at risk for poorer health outcomes.

Manifestations of Ageism

People's beliefs about older adults cause them to treat the aged in certain ways (i.e., age discrimination) like talking more loudly, slowly, and with simplified language. These actions, while often well-intended, result in overaccommodation and infantilization (Nelson, 2005). Even these more positive displays of ageism have detrimental effects on aging adults. For example, stereotyped individuals may experience a decrease in self-efficacy when others perform day-to-day tasks for them unnecessarily. The cumulative effects of experienced age discrimination likely takes a toll on one's ability to manage stressors and diminishes coping resources as was found with stereotyped groups who face microaggressions (Lui & Quezada, 2019).

Age Discrimination in the Workplace

Ageism can be found in various interactions, but those in the workplace and healthcare make particularly significant impacts on outcomes. Older workers (>50 years old) experience longer periods of unemployment after job loss and receive fewer offers for employment than their younger peers providing evidence that age stereotypes impact hiring decisions (Fasbender & Wang, 2017). Involuntary unemployment late-in-life may have serious financial implications for individuals from lower socioeconomic groups. Additionally, it is reasonable to assume that, for those who find purpose in their work, job loss and unemployment late in life could negatively impact mental health outcomes.

For employees, age discrimination toward seasoned workers undermines the progress and success of employees and the organization as a whole. Fasbender and Gerpott (2020) studied knowledge sharing practices among employees aged 50 years or older in the United Kingdom. They found that when aging workers face age discrimination, it negatively impacted their self-reported occupational self-efficacy. Occupational self-efficacy is a domain specific measurement of one's perceived level of competence in their workplace. With lowered occupational self-efficacy, aging employees were then less likely to share their work knowledge with their younger peers to avoid risk of validating competence stereotypes. This dynamic results in loss of institutional knowledge as older employees retire but additionally likely results in an unpleasant work experience for the stigmatized group. In fact, in an online survey study, Australian workers aged 45 years and older were found to be less engaged in their work as a result of perceived age discrimination (Bayl-Smith & Griffin, 2014). It is possible that this decreased engagement is another explanation for seasoned employees' lack of knowledge sharing. Decreased work engagement was then correlated with retirement intentions in that those who were less engaged planned to retire sooner (Bayl-Smith & Griffin, 2014) which aligns with previous research suggesting that employees who experience age discrimination make premature decisions about retirement affecting their financial status late-in-life (Swift et al., 2017). Interestingly, Bayl-Smith and Griffin (2014) also utilized cognitive and affective identification in their study on work engagement and retirement intentions. Cognitive identification referred to a participant's acknowledgement of their membership to the older adult workforce whereas affective identification referred to how participants felt about their group membership. The researchers found that affective identification played a protective role. For those who had positive feelings

about being a late-career employee, perceived discrimination did not impact their work

engagement as much as those who had negative feelings about their group membership.

Age Discrimination in Healthcare

Healthcare is another area in which ageism is pervasive and has severe consequences for

the health and wellbeing of aging adults. Healthcare workers' expectations of normal aging and

older adults' capabilities can impact how they care for them. For example, in a study of long-

term care facilities, nurses who were afraid their patients would fall, restricted patient physical

activity even after controlling for medical risk factors. Implementation of restrictions led to

functional decline as measured by the Activities of Daily Living Scale (Dever Fitzgerald et al.,

2009). Further, elderspeak is utilized by many when interacting with older adults as a result of

age stereotypes. Elderspeak often involves simplified language and referring to aging adults as

one would a child using words like "sweetie" and "honey". This type of communication has been

found to be patronizing to aging adults but is often used by care providers, particularly when

working with dementia patients. An observational study was conducted to explore a possible

relationship between elderspeak and problematic behaviors (e.g., resisting care) in long-term care

facilities. Researchers found that when staff utilized elderspeak, it significantly increased the

probability of residents resisting care as opposed to normal adult talk or silence (Williams et al.,

2009).

Ageist care can also result in undertreatment of symptoms that are inappropriately

attributed to the normal process of aging. For example, those aged ≥ 65 are less likely than

younger patients to have surgery or chemotherapy recommended as a course of treatment for

cancer (Schroyen et al., 2015) and are more likely to be prescribed psychopharmaceutical

medications rather than psychotherapy for treatment of depression (Nelson, 2005). For example,

in a study of treatment recommendations for breast cancer, researchers asked medical students whether they would recommend breast-conservation therapy or modified radical mastectomy for eight patients. The medical students were provided information regarding the similar efficacy of both treatments and the age, race, and occupation of the patients. Additionally, when recommending modified radical mastectomy, students were asked if they would recommend reconstructive surgery. Researchers found that medical students were far more likely to recommend modified radical mastectomy for older (34%) versus younger (14%) patients. Further, they were much more likely to recommend breast reconstruction surgery for younger (95%) versus older (65%) patients (Madan et al., 2001).

Review of this research presents a clear picture of how ageism translates into age discrimination and negatively impacts older adults. However, there are also individual psychosocial factors within aging adults that affect how they respond to or are impacted by ageism and age discrimination which must also be considered when attempting to explain variations in health outcomes late-in-life.

Relationship between Ageism and Aging Perceptions

As represented in the Stereotype Embodiment Theory, ageism negatively impacts SPA and, in turn, leads to negative health outcomes late-in-life (Levy, 2009). However, in order for one's SPA to be negatively impacted, they must first endorse age-based stereotypes and self-identify as a member of the stigmatized group (Levy, 2009). Research on self-perceptions of aging across four subgroups of older adults (early midlife, late midlife, young old, oldest old) provide evidence supporting the stereotype embodiment theory, particularly the role of saliency (i.e., acknowledgement of group membership). The authors found that participants in the early midlife group were more likely to report experiences with discrimination (likely because the

younger group was more diverse) but less likely to attribute them to their age. On the other hand, those in the late midlife group and older reported fewer discriminatory experiences but were more likely to attribute those experiences to their age. It is possible that age stereotypes become more self-relevant in late midlife due to transitional events like retirement and changes in living arrangements as well as societal indicators like drawing Social Security and Medicare enrollment (Giasson et al., 2017).

Furthermore, Giasson et al. (2017) found evidence for a bi-directional relationship between perceived age discrimination and self-perceptions of aging. Participants who reported more age-based discrimination at baseline had more negative views of their aging in the 4-year follow up. Conversely, participants who reported negative self-perceptions of aging at baseline were more likely to report age discrimination. This implies that there are multiple mechanisms at play in the relationship between PAD and SPA. Stereotype embodiment theory provides an explanation of the predictive effects of PAD on SPA, but not the reverse. It is likely that personal characteristics such as explanatory style, personality type, and perceived self-efficacy play a role in individuals' SPA as well.

Self-Perceptions of Aging and Wellbeing

Measures of SPA often include one's felt age referred to as subjective age. Subjective age has been shown to be more predictive of mortality than chronological age (Stephan et al., 2018). Additionally, higher levels of perceived age discrimination have been shown to result in older subjective ages. Research utilizing data from the Health and Retirement Study found that individuals who experienced age discrimination felt subjectively older than those who did not (Stephan et al., 2015). In an attempt to understand this relationship, Marquet et al. (2019) surveyed a group of participants 60-80 years old on measures of subjective age, perceived age

discrimination, self-perceptions of aging, and self-esteem. They found that SPA played a mediating role in the relationship between PAD and subjective age. Further, when holding SPA constant, the relationship between PAD and subjective age was no longer significant (Marquet et al., 2019). Subjective age has also been found to be associated with subjective wellbeing. In a meta-analysis of 35 studies that asked participants ≥ 40 years old about their subjective age, a significant correlation between subjective age and subjective wellbeing was found. Participants who reported feeling younger were more likely to report higher subjective wellbeing. Further, a bi-directional relationship between health and subjective age was found. Participants who felt younger reported better outcomes but it was also found that those who were healthier felt younger (Alonso Debreczeni & Bailey, 2021).

Self-Perceptions of Aging and Health Outcomes

So far, the influence of PAD on health outcomes and SPA has been discussed. It is now necessary to review SPA's impact on aging outcomes in order to fully understand the implications of the Stereotype Embodiment Theory (Levy, 2009). In a study of 89 older adults, Whitehead (2017) found that negative SPA resulted in decreased engagement in certain health behaviors and daily household tasks. The Function Spiral Model was used to explain SPA's role in functional decline through a self-fulfilling prophecy effect. Individuals become stressed when they experience their first limitation attributed to age which is hypothesized to trigger negative self-perceptions of aging. Negative SPA then leads older adults to withdraw from engaging in preventative health behaviors such as screenings and physical activity (Levy & Myers, 2004). As a result of decreased engagement in health behaviors, older adults experience reduced physical capability. This further functional decline reinforces the person's negative self-perceptions of aging (Whitehead, 2017).

Additionally, the Function Spiral Model could explain mechanisms underlying the relationship between self-perceptions and longevity. Levy et al. (2002) conducted a study of community-dwelling seniors tracking mortality over 23 years. The authors found that participants who had more positive self-perceptions of aging at baseline had a median survival of 7.6 years longer than those who harbored more negative views. The relationship also showed evidence of a dose-response effect in that for each one-point increase in positive self-perceptions, risk of death decreased by 13%. If the Function Spiral Model is applied, it could be hypothesized that individuals who experience their first age-attributed limitation later in life, are able to postpone decline resulting in longer life. Further, it is possible that those with a younger subjective age are less likely to attribute illness or injury to age. If this were true, interventions at the attributional level could be protective.

SPA have also been shown to impact measures of mental health. For example, Marquet et al. (2019) found that self-perceptions of aging predicted levels of self-esteem for participants 60-80 years old. Individuals who harbored more negative SPA had significantly lower self-reported ratings of self-esteem. Furthermore, utilizing longitudinal data from the Health and Retirement Study another researcher found that SPA significantly mediated the relationship between perceived discrimination and depressive symptoms. Individuals who reported higher levels of PAD also reported negative SPA and more depressive symptoms than participants who reported no or little discrimination (Han & Richardson, 2015). This finding is particularly important not just for individuals' mental wellbeing but also cognitive health. Research has provided evidence that late-onset depression has irreversible effects on cognitive performance (Ismail et al., 2013) and may be a precursor for mild cognitive impairment and/or dementia (Panza et al., 2010). Depression late in life is also associated with development and exacerbation of chronic diseases

(Unützer, 2007). SPA's effects on mental health could also play a role in gene expression. A compelling longitudinal study by Levy et al. (2018) provided evidence of SPA's protective effects in the development of dementia. Individuals with positive SPA were less likely than their negative counterparts to develop dementia (lowered risk by 43.6%), even among those carrying the APOE gene (lowered risk by 49.8%) considered to be the strongest risk factor for dementia. This finding piques curiosity about how SPA may protect individuals from expression of other genetic diseases.

Self-perceptions of aging also have an indirect effect on physical health outcomes mediated by health behaviors. Multiple studies have shown that participants with negative views on aging are less likely to engage in regular exercise and preventative health activities (Levy & Myers, 2004; Whitehead, 2017) and tend to delay seeking care for ailments (Sun & Smith, 2017). This relationship may be reinforced through interactions with healthcare providers that attribute patients' symptoms to normal aging. For example, if a 75-year-old woman is experiencing a noticeable decline in her memory, she may be more likely to attribute this to her age and refrain from seeing a doctor if she already harbors negative attitudes toward aging. Furthermore, even if she is convinced by a family member to see her doctor, her provider may also attribute the decline to her age, reinforcing her beliefs and contributing to future disengagement from preventative behaviors. This example represents the interdependence of personal and social factors and their perpetuation of negative age stereotypes. Additionally, Sun and Smith (2017) found that participants from a longitudinal study were more likely to report delaying medical treatment or care if they had negative self-perceptions of aging. These participants also reported more barriers to care which potentially provides additional evidence for SPA's impact on self-efficacy (Tovel et al., 2019). In other words, negative self-perceptions

of aging lead to lower levels of self-efficacy, leaving individuals feeling incapable of navigating the necessary steps (e.g., scheduling, transportation, insurance coverage) to obtaining treatment. Further, a dose-response relationship was found between self-perceptions of aging and overnight hospital stays. Participants reporting SPA at the 25th, 50th and, 75th percentiles, had a 33%, 36%, and 55% lower rates of hospital stays, respectively, over a 4-year (Sun et al., 2017).

In an attempt to explain the relationship between negative SPA and reduced health behaviors found in the previous research, Tovel et al. (2019) conducted a longitudinal study with participants ≥ 75 years old in Israel. The authors collected measures of physical functioning, SPA, and self-efficacy through a structured interview facilitated by phone or in-person. They found that participants' SPA at time one were positively correlated with physical functioning two years later. This relationship was significantly stronger than that of physical functioning at Time 1 with SPA at time two providing evidence of directionality. Additionally, it was found that SPA impacted physical functioning through the mediating effects of self-efficacy. Again, directionality was found in that SPA at Time 1 was significantly correlated with self-efficacy over time but not the reverse. In other words, participants who had negative SPA were more likely to score lower on measures of self-efficacy and report poorer physical functioning. Individuals who had high levels of self-efficacy were more likely to engage in preventative health behaviors that support physical functioning.

Self-Efficacy, SPA, and Health Outcomes

Previous research has provided evidence that self-efficacy is also associated with both SPA and health outcomes. Tovel and colleagues (2019) assessed the directionality of relationships between SPA, self-efficacy, and physical functioning among 892 Israeli adults 75 years and older. All three variables were measured at baseline and two years later. The authors

found that there were significant declines in both SPA and physical functioning from time one to time two but no significant changes in self-efficacy across time. A bidirectional relationship was found between SPA and physical functioning. However, the influence of SPA at Time 1 physical functioning at time two was more significant than the influence of physical functioning at time one on SPA at Time 2. Further, they explored a bidirectional relationship between SPA and self-efficacy but only found a significant effect from SPA at Time 1 self-efficacy at Time 2. Lastly, self-efficacy was found to fully mediate the relationship between SPA at time one and physical functioning at Time 2.

Luo et al. (2020) also explored bidirectionality between SPA and self-efficacy measured as perceived control of life (COL). Utilizing data from three different time points in the Health and Retirement study, the researchers utilized a random intercept cross-lagged panel model (RI-CLPM) to explore directionality of the relationship between SPA and COL at both the between-person and within-person levels. They discovered a significant, bidirectional relationship between SPA and COL both at the within-person and between-person levels. In other words, more negative SPA and time one and time two predicted lower COL at time two and time three. Additionally, lower COL at time one and two predicted lower SPA at time two and time three. However, the effect of SPA on COL was significantly larger than COL on SPA.

Self-Efficacy's Role in Stress, Appraisal, and Coping

The established mediating effects of self-efficacy on the relationship between SPA and health outcomes can be conceptualized as a stressor's negative impact on coping resources. In other words, PAD and negative SPA reduce one's self-efficacy. Further, self-efficacy is a resource utilized when coping with the threat that aging creates a barrier to one's goals and wellbeing. However, few studies have focused on the role of self-efficacy as an individual level

protective factor during primary appraisal related to perceived age discrimination. Only one article was found that explored the buffering effects of sense of control on the relationship between PAD and psychological distress. The sense of control measure in the study was similar to that of Luo and colleagues' (2020) COL measure and includes items reflecting personal mastery and constraints. The researchers found that PAD was associated with more psychological distress. However, participants who reported high levels of self-efficacy were less likely to experience psychological distress as a result of PAD (Vogt Yuan, 2007). This finding provides justification to explore if high self-efficacy at the primary appraisal of PAD has the ability to interfere with the internalization of age discrimination as negative SPA.

Hypotheses

The current study proposes a model conceptualized through the combination of the Transactional Stress Model and Stereotype Embodiment Theory to explore factors contributing to variation in outcomes late in life. Through these theoretical lenses, perceived age discrimination presents a stressor. When aging adults face that stressor, they call on individual level factors (i.e., self-efficacy) to appraise the potential of the experience to negatively impact their goals and overall wellbeing. If PAD is experienced as relevant to oneself and therefore threatening, it will negatively impact one's self-perceptions of aging. The individual then considers options for coping with PAD and resulting impact on SPA in a secondary appraisal. This whole process than determines the overall impact on health outcomes and life satisfaction.

The current study focuses on the relationships between perceived age discrimination, self-perceptions of aging, self-efficacy, and health outcomes and life satisfaction. To explore directionality, data from the Health and Retirement Study at two separate time points are utilized

with time one in 2012 and time two in 2016. Figure 1 is an illustration of the hypothesized relationships.

1. SPA in 2016 will mediate the relationship between PAD in 2012 and health outcomes in 2016. Specifically, there will be a significant indirect effect from PAD to health outcomes through SPA.

2. SPA in 2016 will mediate the relationship between PAD in 2012 and life satisfaction in 2016. Specifically, there will be a significant indirect effect from PAD to life satisfaction through SPA.

3. Participants perceived level of self-efficacy in 2012 will moderate the relationship between PAD in 2012 and SPA in 2016.

4. Results will provide evidence of moderated mediation in that self-efficacy will moderate the indirect effect of PAD in 2012 on health outcomes in 2016 through SPA in 2016.

5. Results will provide evidence of moderated mediation in that self-efficacy will moderate the indirect effect of PAD in 2012 on life satisfaction in 2016 through SPA in 2016

Chapter II

Methods

Data Source

The current study utilizes public survey data from the Health and Retirement Study

(HRS) conducted by the University of Michigan's Institute for Social Research. The HRS is a

longitudinal panel study supported by the National Institute on Aging (NIA U01AG009740) and

Social Security Administration and aims to build a better understanding of variability in the

aging experience and how policy effects individual outcomes (Sonnega & Smith, 2015).

The HRS includes data from over 37,000 individuals from roughly 23,000 households

across the United States. Participants are individuals aged 50 years and older along with their

spouses or partners when relevant. Data collection for the HRS started in 1992 and comprised of

individuals born between 1931-1941. A year later, the Asset and Health Dynamics Among the

Oldest Old (AHEAD) was added as a supplemental study including a cohort born between 1890-

1923. These two studies were merged in 1998 with the addition of two birth cohorts, one born

between 1924-1930 and the other between 1942-1947. Since the merging of the studies in 1998,

new birth cohorts have been added every six years. The HRS sample currently includes data

from participants born between 1890-1964 and is considered to be nationally representative. Due

to the health disparities among different racial and ethnic groups, both African Americans and

Hispanics were oversampled 2:1 in comparison with White participants. Additionally, because

of the changing dynamics of women in the workplace over the last several decades and the

underrepresentation of women in retirement research, the study also included spouses of age-eligible participants regardless of age (Sonnega & Smith, 2015).

Data collected in the Health and Retirement Study spans across a wide range of variables including sociodemographic information, physical health measure, psychosocial measures, and employment and retirement information. Most of the data is gathered during a 3-hour interview, conducted by phone or in person, with the exception of a leave behind Psychosocial and Lifestyle Questionnaire that participants complete after the interview and return by mail. Participants received monetary incentives for completion of various components of data collection (Sonnega & Smith, 2015).

The current study utilizes public survey data from the 2012 and 2016 core interviews. Four different datasets from each time point containing information about participants' demographics, wealth, health conditions, and psychosocial functioning were merged to form the current sample (Health and Retirement Study, 2012; Health and Retirement Study, 2016).

Current Study Participants

Participants in the current study include 676 individuals ranging from 42 to 91 years old (*M*=67.17, *SD*= 9.79) at the time of the interview in 2012. All 676 participants completed interviews in both 2012 and 2016. Females represented 61.4% and men 38.6% of the sample. Black or African Americans comprised 13.6% of participants as compared to 81.2% White and 5% Other (American Indian, Asian, Native Hawaiian or Pacific Islander, Alaskan Native). In terms of ethnicity, 8.3% identified as Hispanic and 91.7% as non-Hispanic. The majority of participants were married (59.6%) or had been at some point in their lives (21.3% separated/divorced and 15.5% widowed) with only 3.6% who never married. The average number of years of education completed was 13.22 (14.2% less than high school, 32.2 % high

school, 26.5% some college, 11.8% college graduates, 14.2% post college). Regarding

socioeconomic status, a calculation of total wealth was utilized. Wealth for participants in the

current study ranged from -$278,935 to $7,705,00 with an average of $375,110 and median of

$135,750 which is somewhat lower than the national median in 2013 (*Survey of Consumer*

Finances, 1989 - 2019, 2020). Table 1 provides the descriptive statistics for the demographic

variables.

Measures

Perceived Age Discrimination

The HRS Psychosocial and Lifestyle Questionnaire includes a series of questions

regarding one's perceived experience with stress and barriers associated with everyday

discrimination. Items from the scale have been utilized in previous research, such as the Detroit

Area Study (DAS), with high reliability (α= .88; Williams et al., 1997). The measure includes six

items including statements such as "You are treated with less courtesy or respect than other

people," "People act as if they think you are not smart," and "You receive poorer service or

treatment than other people from doctors or hospitals." Participants respond to these statements

on a Likert scale from one (*Almost Every Day*) to six (*Never*). These items are followed by a

question about what participants attribute the experienced discrimination to (e.g., age, race,

gender, etc.). For the purposes of this study, only individuals who attributed perceived everyday

discrimination to age were included. Scores were reverse coded and averaged across the six

items so that higher scores indicate higher levels of perceived discrimination. Among the 2012

participants, the measure provided evidence of strong internal consistency with Cronbach's

alpha= .83 (Smith et al., 2017) and for the current study, α= .80.

Self-Perceptions of Aging

The Attitudes Toward Own Aging subscale of the Philadelphia Geriatric Center Morale Scale (Liang & Bollen, 1983) was utilized with the addition of three items from the Berlin Aging Study (Kotter-Grühn et al., 2009) to increase reliability of the measure resulting in a total of eight items. Participants responded to the items on a Likert scale from one (*strongly disagree*) to six (*strongly agree*). The scale can be multidimensional to reflect positive and negative SPA, but for the purposes of this study, negatively worded items were reversed to create a unidimensional index of positive SPA where higher scores reflect more positive SPA. The measure provided evidence of reliability among HRS participants who completed the measure in 2012 (α= .81; Smith et al., 2017) as well as within participants of the current study (α=.80).

Self-Efficacy

Self-efficacy was measured utilizing the perceived mastery scale in the HRS Psychosocial and Lifestyle Questionnaire. The scale includes five items taken from the Midlife in the United States Study conducted by the University of Wisconsin (Ryff et al., 2017). Items include statements such as "I can do just about anything I really set my mind to" and "When I really want to do something, I usually find a way to succeed at it" in which participants respond on a Likert scale from one (*strongly disagree*) to six (*strongly agree*). An average self-efficacy score was calculated for each participant in which higher scores reflect higher self-efficacy. The measure provided evidence of reliability among the HRS participants who completed the measure in 2012 (α= .91; Smith et al., 2017). Cronbach's α=.91 for the self-efficacy scale in the current study.

Health Outcomes

Health conditions were self-reported by participants during the three-hour HRS interview. Interviewers asked participants about a wide range of conditions (e.g., "Has a doctor ever told you that you have high blood pressure or hypertension?"). Certain conditions were specifically selected for the study both to provide a thorough snapshot of participants' health at each time point and because they are common indicators of morbidity and mortality in the U.S. (Fisher et al., 2005). The current study includes high blood pressure, diabetes, cancer of any kind, lung disease, heart conditions, stroke, psychiatric problems, Alzheimer's disease, dementia, arthritis, osteoporosis, recent falls (within the past 2 years), incontinence, trouble with pain, and other medical conditions. A single variable was created representing a count of health conditions a participant reported having, resulting in a possible range from 0-15. The health outcomes measure is used as a consequent variable at time two (2016) and a covariate at time one (2012).

Life Satisfaction

A measure of participants' life satisfaction was collected as part of the HRS Psychosocial and Lifestyle Questionnaire utilizing Diener's Satisfaction with Life Scale (SWLS; Diener et al., 1985). The scale consists of five items which participants respond to a Likert scale from one (*strongly disagree*) to seven (*strongly agree*). An average score was created for each participant in which high scores reflect higher life satisfaction. The scale aims to tap into how one judges their own life in comparison to the subjective standards they have set for themselves in order to measure global life satisfaction (e.g., "In most ways my life is close to ideal"). The SWLS has proven to be reliable in previous studies (α= 0.79-.89; Pavot & Diener, 2008) and reflected as such among the HRS participants who completed the measure in 2012 (α= .88; Smith et al.,

2017). For participants in the current study, the reliability of the measure was consistent with previous findings (α=.88).

Covariates

Demographic variables collected at time one (2012) including participants' age, sex, level of education, marital status, race, ethnicity, socioeconomic status, and health conditions were factored into the analytical model. These variables were selected and held constant due to their interdependence and previous research of their effects on health outcomes (Gutiérrez-Vega et al., 2018; Williams et al., 1997). Covariate measures were collected as part of the HRS core interview. Age was reported as an actual value at the time of the interview and sex was reported as a dichotomous variable (i.e., 1=male, 2=female). Many financial measures were collected as part of the HRS interview and in the current study, socioeconomic status refers to an actual value of participants' total wealth. Participants reported educational attainment as number of years in school from zero (no formal education) to seventeen (post-college). Marital status was reported by participants as either married (1), separated or divorced (2), widowed (3), never married (4), or marital status unknown (5). Race was grouped into three categories, white (1), black or African-American (2), or other (7) which includes Asian, Native Hawaiian or other Pacific Islander, and Native Alaskan and ethnicity was reported as Hispanic-Mexican (0), Hispanic-Other (1), Hispanic-Unknown (2), or Non-Hispanic (3).

Procedure for Creating Dataset

In order to explore potential directionality of relationships, data was utilized among participants who had data across two time points. The 2012 HRS Core data and 2016 HRS Core data were selected as the time points of interest based on consistency of the Psychosocial and Lifestyle Questionnaire across those points and the number of participants who had complete

data for the variables of interest. Once the two time points were identified, the datasets housing psychosocial, physical health, and demographic variables were downloaded into IBM SPSS Statistics 27. To make the datasets more manageable, variables that were not being utilized for the study were removed.

In the two psychosocial datasets (2012 and 2016), items in the SPA scale were reverse coded to create a unidimensional scale of positive SPA. Additionally, all the items in the perceived everyday discrimination scale were reverse coded so that higher scores reflected higher levels of discrimination. Once reverse coding was completed, new mean variables were computed for life satisfaction, self-efficacy, self-perceptions of aging, and everyday discrimination and participants with missing data were removed.

Everyday discrimination also had eleven follow up items in which participants selected personal characteristics (e.g., national origin, gender, race, age, religion, weight, disability, other aspects of physical appearance, sexual orientation, financial status, or other) for which they attributed the perceived discrimination. Participants were able to select multiple characteristics, so a syntax was run to create a new variable that identified participants who attributed discrimination to age. Participants who did not attribute discrimination to age were then removed from the sample. It should be noted that participants were not removed if they selected other characteristics, in addition to age, for which they credited perceived discrimination.

Health conditions appeared in the data across multiple variables. In order to create single variable reflecting a count of each participant's reported health conditions, new indicator variables were computed so that one reflected the condition was present at the time of the interview and zero reflected the condition was not present. Once indicator variables were created for each of the conditions, a variable was computed to reflect a count of health conditions for

each participant with a possible range from 0-15. Additionally, in order to utilize demographic variables as covariates, some were recoded as dichotomous variables including gender (male= 1, female= 0), race (white= 1, other= 0), ethnicity (non-Hispanic= 1, Hispanic= 0), and marital status (1= married, 0= not married). Total wealth was computed into a new categorical variable with a possible range from 1 (least wealth) to 7 (most wealth) to reduce the effect of outliers. The remaining covariates (age, education, 2012 health conditions) were left in their original form. Finally, each of the HRS datasets had a series of variables that identify individual participants and so two of those variables (household ID and person number) were combined in each dataset to create one key variable. This key variable was then utilized to merge all the files into one complete dataset. Once merged, cases for which data was missing for the psychosocial variables were again removed leaving 676 participants for the final sample.

Analytic Approach

Descriptive statistics for the demographic variables (Table 1) were computed utilizing IBM SPSS Statistics 27. Since the current study aims to examine differences in individual factors that may explain variability in health outcomes, conditional process analysis was reviewed. Specifically, Hayes' (2018) moderated mediation Model 7 was found to fit the conceptual model. Conditional process analysis allows researchers to explore characteristics of a sample that may change the relationship of two variables (Hayes, 2018). In this study, moderated mediation allows exploration of how or if an individual's level of self-efficacy changes the relationship between PAD and SPA, ultimately impacting health outcomes and life satisfaction. First, a correlation matrix was produced for all the study variables (Table 2). Then PROCESS macro, an add on to SPSS, was utilized to explore a simple mediation model (Model 4) to test hypothesis 1 and 2 followed by a simple moderation model (Model 1) to test hypothesis 3. The results at this

point did not justify exploration of the moderated mediation model (Model 7) to test hypotheses

4 and 5.

Chapter III

Results

Table 1 provides descriptive statistics for the demographic variables utilized as covariates in the analysis. Table 2 provides means, standard deviations, and Pearson's correlation coefficients for each of the study variables. The significant correlations between PAD in 2012 and SPA, health conditions, and life satisfaction in 2016 provide evidence that their relationships are worth exploring. Higher reported PAD in 2012 was associated with more negative SPA in 2016 (r= .144, p< .01) and negative SPA in 2016 was associated with increased number of health conditions (r= -.366, p< .01) and lower life satisfaction (r= .374, p< .01) in 2016 as compared to more positive SPA. Further, self-efficacy was significantly correlated with all the variables in the hypothesized model. High self-efficacy was associated with lower reported PAD and fewer health conditions as well as more positive SPA and greater life satisfaction.

Mediation

Health Outcomes

Hypothesis 1 was tested by running Model 4 in SPSS utilizing PROCESS macro represented in Figure 2 and Table 3. The results provided evidence that PAD in 2012 (X) predicted SPA in 2016 (M), b= -.191, t(442)= -3.459, p< .001, 95% CI [-.299- -.082]. The relationship is negative and reflects that higher PAD is associated with more negative SPA. Further, SPA in 2016 predicted health outcomes in 2016 (Y), b= -.308, t(441)= -4.763, p< .001, 95% CI [-.434- -.181]. This was also a negative relationship revealing that negative SPA was

related to having more health conditions. Neither the total effect (*b*= .296, t(443)= 2.464, p= .014, 95% CI [.060- .533]) nor the direct effects (*b*= -.068, t(441)= -.897, p=.370, 95% CI [-.217- .081]) of the model proved significant. However, the indirect effect provided evidence that health outcomes were significantly affected by PAD's influence on SPA (*b*= .059, CI [.022- .110]). In other words, results show that the effect of PAD on health is mediated by SPA in support of hypothesis 1.

Life Satisfaction

Model 4 was also run to explore SPA's mediation of PAD and life satisfaction which also proved to be significant supporting hypothesis 2. As shown in Figure 3 and Table 4, SPA in 2016 predicted life satisfaction in 2016, *b*= .572 t(442)= 8.311, p< .001, 95% CI [.437- .707]. The total effect was significant (*b*= -.171, t(442)= -1.996, p= .047, 95% CI [-.340- -.003]) whereas the direct effect was not (*b*= -.062, t(443)= -.766, p=.444, 95% CI [-.221- .097]), reflecting a full mediation effect of PAD on life satisfaction through SPA.

Moderation

Hypothesis 3 was tested by conducting a simple moderation analysis with PROCESS macro in SPSS represented in Figure 4. As suggested by Hayes (2018), continuous variables that define products were mean-centered. The analysis revealed that for cases in which self-efficacy is at the mean, PAD significantly predicted SPA (*b*= -.126, *t*(440)= -2.281, *p*= .0230, 95% CI [-.234- -.017]). Therefore, when self-efficacy is at the mean, higher PAD in 2012 predicts more negative SPA in 2016. Further, for cases in which PAD is at the mean, self-efficacy significantly predicted SPA (*b*= .258, *t*(440)= 6.727, *p*< .001, 95% CI [.182- .333]). Specifically, when PAD is at the mean, higher self-efficacy in 2012 predicts more positive SPA in 2016. However, the interaction of PAD and self-efficacy was not a significant predictor of SPA (*b*= -.031, *t*(440)= -

.873, *p*= .383, 95% CI [-.100- .038]). In other words, the effect of PAD on SPA, does not vary across levels of self-efficacy and so Hypothesis 3 is not supported. Because the moderation effect was not significant there was no justification to move forward with the statistical analysis of the full conceptual model (Model 7).

Chapter IV

Discussion

The current study aims to build on existing research related to the underlying psychosocial factors that contribute to variability in health outcomes and life satisfaction late in life. Plainly stated, it seeks to explain why some individuals feel and seem "old" earlier in late life while others grow to be members of the oldest old before feeling or seeming "old". In the formation of the hypotheses, the Stereotype Embodiment Theory (Levy, 2009) was reviewed through the lens of the Transactional Stress Model (Lazarus & Folkman, 1987) to explore if individual factors related to stress appraisal and coping accounted for variability in outcomes. Specifically, this is the first study, to the best of this author's knowledge, to explore the potential protective effects of self-efficacy in the cognitive and emotional internalization of perceived age discrimination (i.e., development of negative self-perceptions of aging).

Mediation analysis confirmed previous findings reflecting that PAD negatively impacts health outcomes indirectly through SPA. Participants who reported high levels of PAD in 2012 were significantly more likely to report negative SPA in 2016 and in turn an increased number of health conditions in 2016 as opposed to those reporting lower PAD. Further, SPA was found to mediate the relationship between PAD and life satisfaction in a similar way; higher PAD in 2012 and more negative SPA in 2016 resulted in lower reported life satisfaction in 2016. This finding adds to the body of research on the various outcomes that are impacted by the effects of PAD on SPA (Alonso Debreczeni & Bailey, 2021; Han & Richardson, 2015; Levy & Myers, 2004; Sun & Smith, 2017; Whitehead, 2017).

Unique to this study, self-efficacy was explored as a potential moderator of PAD's influence on SPA. Conceptually, it was hypothesized that during primary appraisal of the stressor PAD, individuals with high self-efficacy would experience a protective effect on their SPA. In other words, an individual's level of self-efficacy would alter the cognitive and emotional process involved in evaluating the threat of PAD and, ultimately, create variation in SPA. The moderation analysis, however, did not prove to be statistically significant. Participants' level of self-efficacy did not appear to contribute to PAD's effect on SPA.

While self-efficacy did not prove to be a statistically significant moderator, continued examination of its possible protective effects should not be abandoned. It is possible in the application of the transactional model of stress, the hypothesized timing of primary appraisal occurring after one perceives they have experienced age discrimination was flawed. While directionality cannot be determined, the statistically significant correlation found between PAD and self-efficacy is notable. The negative relationship could provide evidence in support of stereotype threat theories (Lamont et al., 2015). In other words, those with high levels of self-efficacy are less likely to identify as "old" and therefore do not interpret discrimination experiences as related to their age.

Alternatively, one could hypothesize that aging adults who report high levels of self-efficacy may, in fact, experience less discrimination than those at lower levels. Bandura's self-efficacy theory claims that self-efficacy impacts an individual's behavior (Bandura, 1977). For example, if an individual is unsure of their ability to effectively manage an environment, they may behave in ways that minimize their perceived risk or avoid certain situations altogether. Findings presented earlier in this paper support this idea linking low levels of self-efficacy to reduction in health behaviors such as engaging in physical activity and preventative care (Levy

& Myers, 2004; Whitehead, 2017). Therefore, it is reasonable to postulate that aging adults with high levels of self-efficacy are less likely to engage in behaviors that validate age stereotypes and so are able to avoid being seen by others as part of the stigmatized group.

The influence and relationship of the covariates in the analytical model should also be considered in the interpretation of findings. It should be noted that age was significantly correlated with both ethnicity and race reflecting that the younger cohort of participants was more diverse. Additionally, similar to the findings of Giasson et al. (2017) younger age was associated with higher reported PAD. This could be due to the measurement of PAD which is discussed in limitations below. However, it could also reflect that, those on the younger end of the spectrum, are engaged in more situations where age discrimination is common as compared to those who are older. For example, it is likely that younger participants are still working and face stereotypes about their occupational competence (Fasbender & Gerpott, 2020). According to Nelson (2005), the development of age stereotypes is rooted in the rise of technology during the industrial revolution and the changing skills needed to participate in the workforce. Considering this historical context, it is possible that with each technological revolution, age stereotypes are validated. Particularly, in the workplace, as younger employees come in with the necessary skills, seasoned workers may require training and so are seen as incompetent in comparison to their younger colleagues. Furthermore, technological skills are now required to engage in many other aspects of our society outside of the workplace. For example, people now conduct much of their day-to-day lives online including banking, paying bills, access to medical records and care, and even socializing with others. Aging adults are now faced with age discrimination not just in the workplace, but in many other aspects of managing everyday responsibilities.

Another covariate that should be considered is wealth which was significantly correlated with all the study variables with the exception of SPA in 2016. Specifically, wealth's positive correlation with self-efficacy should be considered in the interpretation of the moderation results. It is reasonable to assume that as wealth rises so does access to resources. This inspires curiosity about the relationship between access to resources and self-efficacy and if those with low self-efficacy can mask its effects by employing financial resources to successfully manage their environment. For example, it is possible that an individual with the financial resources to pay for lawn services reports the same level of self-efficacy related to the task as an individual with little resources but confidence in their capability to successfully mow the lawn themselves. If this were accurate, maybe self-efficacy does play a protective role, just at lower levels of financial wellbeing.

Findings' Relation to the Literature

The findings in the current study support Levy's (2009) Stereotype Embodiment Theory as an explanation for how age discrimination can negatively impact health and wellbeing outcomes for aging adults. The theory suggests that individuals internalize age stereotypes across their lifespan which then become self-relevant late in life and negatively impact SPA. The current study's measurement of SPA, four years after reported PAD, may provide further evidence that this process happens overtime. Further, the current research confirms SPA as a mediator in the relationship between PAD and aging outcomes. The theory goes further to suggest that age stereotypes impact individuals through three different pathways: psychological, behavioral, and physiological. The psychological pathway refers to the influence of age stereotypes and discrimination on one's expectations of what it means to grow old. Changing expectations then influence behavior and physiological responses that validate one's expectations

creating a self-fulfilling prophecy effect (Levy, 2009). The current study focused on the psychological pathway and identified self-efficacy as an individual factor that could play a role in how PAD influences one's aging expectations.

Implications

Overall, important insights can be drawn from the current and previous findings reviewed. It has become clear that self-perceptions of aging are an important factor in aging outcomes. Further, others have provided evidence that saliency is an important component in the perception of age discrimination and development of SPA (Giasson et al., 2017). Therefore, it leaves one to wonder if there are opportunities for interventions during specific life transitions that trigger self-relevance of age stereotypes. For example, many organizations offer pre-retirement programming for their staff, however, seem to focus primarily on financial planning. It could be valuable for this programming to include preparation for the psychosocial implications of retirement such as psychoeducation surrounding aging expectations.

In fact, some studies have provided evidence that self-perceptions of aging are a worthwhile target for intervention. Brothers and Diehl (2017) implemented Aging[Plus], a two-pronged approach to increasing physical activity among older adults. The first component of the program was educational in nature and taught participants how to recognize age discrimination, dispelled myths about aging, and addressed control beliefs. During the second portion of the program, individuals worked toward physical activity goals with the support of program staff. In order to assess the program's validity, measures of self-efficacy, views on aging, and physical activity levels were collected at baseline, post-test, and delayed post-test. Results showed that the intervention improved participants' views on aging as evidenced by measures of self-perceptions, general views on aging, and subjective age. Additionally, the program improved

participants' control beliefs as evidenced by measures of general self-efficacy and exercise self-efficacy specifically (Brothers & Diehl, 2017).

Additional interventions such as this should be conducted across other domains of health as well. For example, interventions employing a similar educational approach including assertive communication training for participants to utilize in healthcare settings would be particularly useful. Considering the pervasiveness of negative age stereotypes in healthcare (Dever Fitzgerald et al., 2009; Nelson, 2005; Schroyen et al., 2015; Williams et al., 2009), an intervention like this could reduce participants' attribution of symptoms to age and increase care-seeking and preventative health behaviors. Furthermore, it has the potential to build a specific domain of self-efficacy, empowering participants to better advocate for themselves with providers.

Similarly, multifaceted interventions focused on the patient-provider relationship offer an opportunity to reduce ageist care and better involve seniors in care and treatment decisions. In the study that provided evidence for a correlation between negative self-perceptions of aging and delay behavior in seeking care, researchers also discovered that dislike of going to the doctor was reported to be a significant barrier (Sun & Smith, 2017). It is possible that this is a result of poor patient-provider relationships leading to discomfort or distrust among patients. Interventions that train medical providers in more person-centered approaches could challenge doctors to consider aging patients in a wider context including living situation, social supports, individual psychosocial factors, and engagement in activities of daily living (Clayman et al., 2017). This paired with assertive communication training for elderly patients could improve patient-provider relationships and, as a result, patient outcomes. Interventions like this, also have the potential to dispel myths about aging and reduce age discrimination.

Adult children of aging parents are also a potentially valuable population to focus on for educational interventions. As revealed by the previous research on caregiver restrictions (Dever Fitzgerald et al., 2009), the negative age stereotypes held by those providing support can be detrimental to outcomes late in life. Educational interventions for this population could include dispelling myths about "normal" aging and ways to provide opportunities for boosting self-efficacy. These types of interventions would strengthen the support system of aging adults particularly around advocacy in healthcare settings.

Another important point to consider is the cumulative effect of experiencing multiple types of discrimination. Previous research provides evidence that discrimination, not just age-based, is stressful and negatively impacts individual wellbeing (Lui & Quezada, 2019). It is likely that those who are faced with discrimination as a result of membership in multiple stigmatized groups are at increased risk for developing health conditions and lower life satisfaction. Future research should focus on the underlying mechanisms involved in stress appraisal and coping for those who identify with multiple stigmatized groups. In other words, do these individuals experience each type of discrimination as equally stressful? It is possible that psychosocial factors play different roles across various experiences. For example, one's self-perceptions related to identification as an aging adult may have a positive influence on outcomes while self-perceptions related to being a person of color are detrimental.

Lastly, while the current study focused on the stigmatized individual's perceptions, those of the non-stigmatized group should also be explored further. It is unclear from the current research if there is variation in how and when others engage in discrimination against older adults. In other words, it would be valuable to examine how older adult's behaviors and

presentation to the outside world influence other's perceptions of them and behavior toward them.

Study Limitations

The findings should be considered within the context of the study limitations. The primary limitation of the current study lies in the measurement of PAD. As presented in the methods section, the PAD variable was derived from an Everyday Discrimination variable. Participants in the study were limited to those who attributed discrimination to age. However, participants who indicated other reasons for discrimination in addition to age were not removed. This makes it difficult to interpret how much perceived discrimination is specifically attributed to age versus other items. Additionally, the participant mean for PAD was quite low (2.12) on a seven-point Likert scale with a small standard deviation (.081), leading to a possible floor effect.

The self-report nature of the measures also creates challenges in producing data that represents participants accurately, particularly regarding the consequent variable health outcomes. Rather than relying on participants to list all their diagnosed conditions from free recall, they were asked to report their status for a series of specific health conditions. This likely increases self-report reliability in the utilized measure, however, it is still possible for participants to have either over or under reported their diagnosed conditions. Utilizing more objective measures of health in addition to self-report variables would provide a more accurate representation of participant outcomes.

Additionally, although common practice in the field, a count of diagnoses does not account for varying severity of a participant's health conditions or whether or not they are being managed successfully. In other words, it is possible that some participants are more negatively impacted by one or two severe and/or poorly managed conditions as compared to those who have

more conditions that are less severe and/or successfully managed. This supports the need for a biopsychosocial perspective in setting standards of care and expectations for successful aging outcomes.

Conclusions

In summary, the current study adds to the literature supporting the conceptualization of the development of self-perceptions of aging through the Stereotype Embodiment Theory. Perceived age discrimination predicts self-perceptions of aging and in turn influences the health and wellbeing of aging adults. Analyzing this effect through the combined conceptualization of Stereotype Embodiment Theory and a Transactional Model of Stress inspired a focus on individual level psychosocial factors involved in the appraisal and management of stress to further explain variability in late life health outcomes. Further, a specific focus on self-efficacy adds to the exploration of individual level factors that may present opportunities for intervention. It is clear from this study and the body of previous research that perceived age discrimination negatively impacts aging adults through multiple pathways. This fact is particularly concerning considering the growing number of adults 55 and older in the United States. Moreover, the impact is felt on multiple levels and has implications for patient-provider relationships, multi-generational workplaces, and individual outcomes for aging adults. Therefore, it is imperative for the scientific community to continue exploring the biopsychosocial factors involved in variability of outcomes late in life.

Figures

Figure 1

Hypothesized Relationship between Perceived Ageism and Health Outcomes/Life Satisfaction
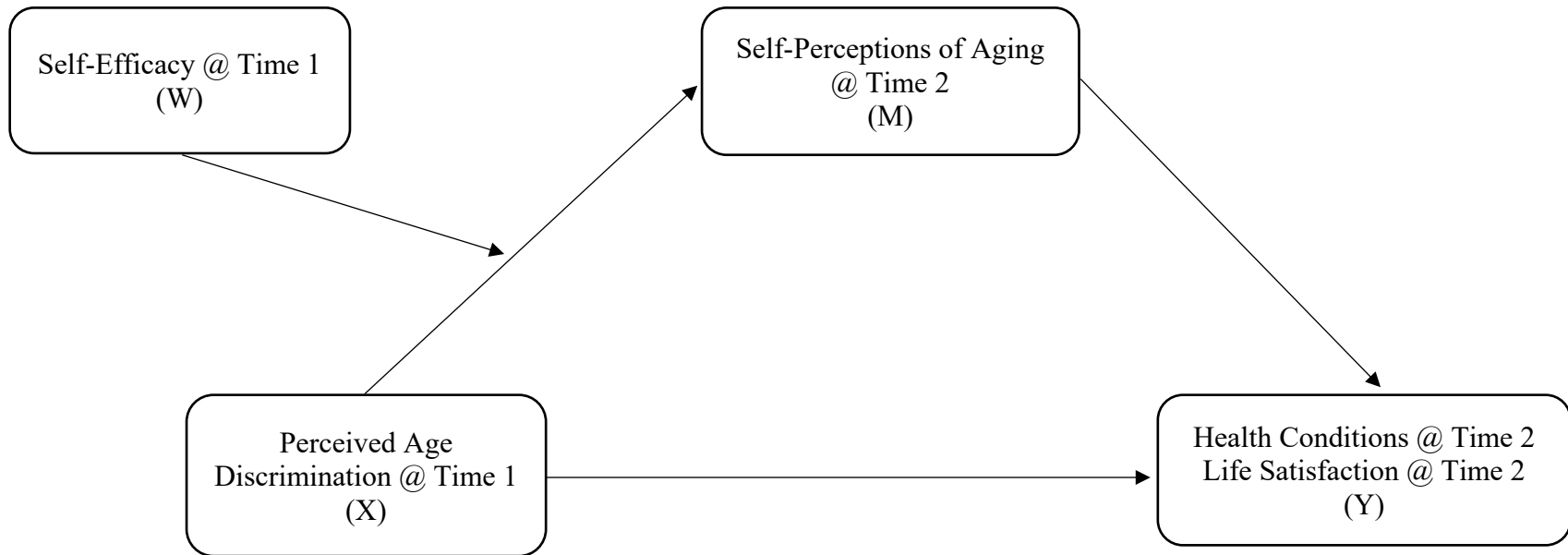
Figure 2

Mediation of Perceived Age Discrimination and Health Outcomes Through Self-Perceptions of Aging
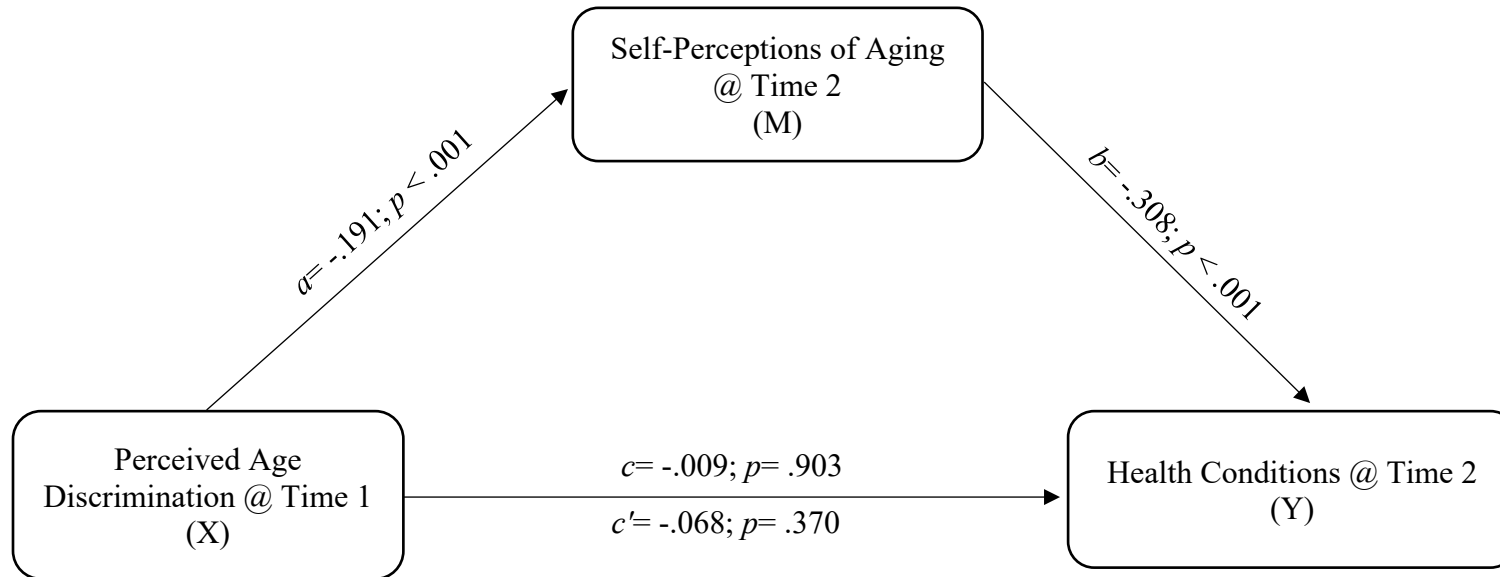
Figure 3

Mediation of Perceived Age Discrimination and Life Satisfaction Through Self-Perceptions of Aging
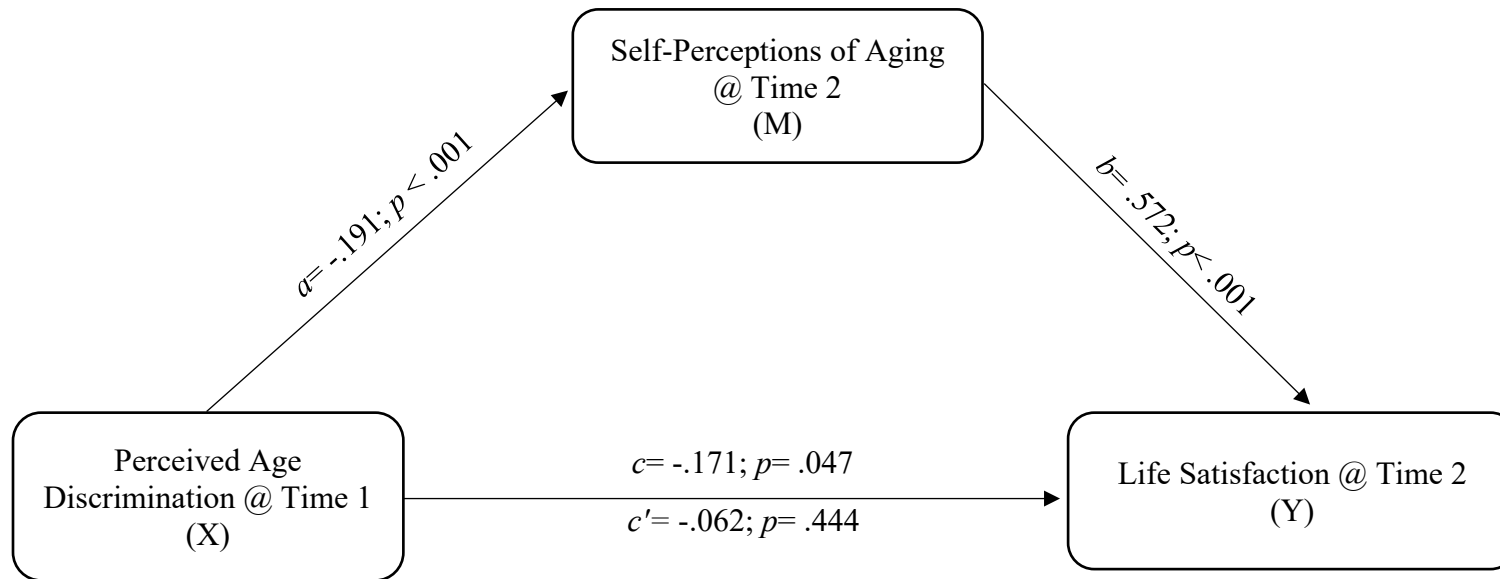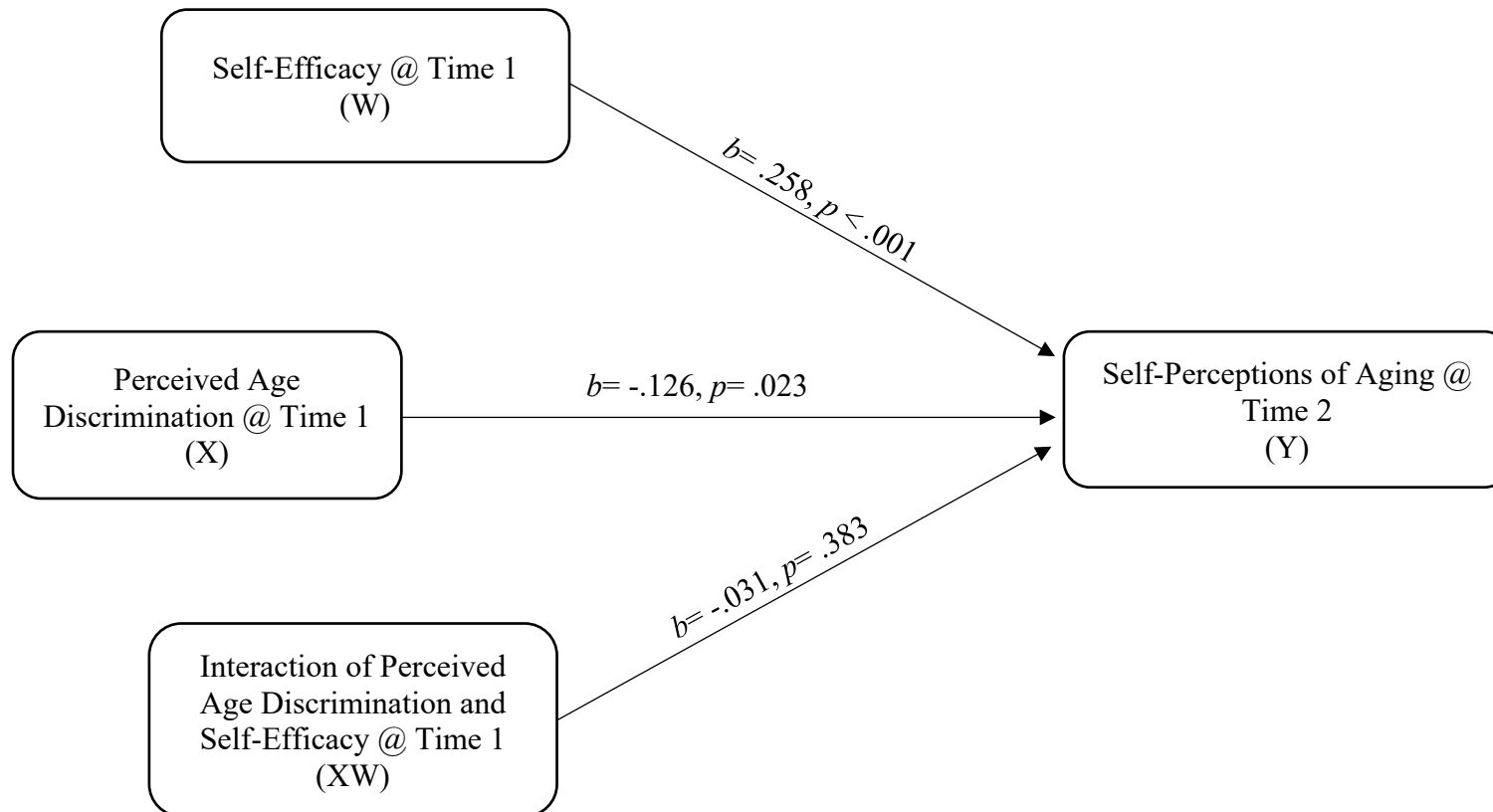
Figure 4

Effect of Self-Efficacy on Perceived Age Discrimination's Relation to Self-Perceptions of Aging

Tables

Table 1

Descriptive Statistics

Demographic Variables	%	Demographic Variables	%
Gender		Age	
Male	38.6	≤ 55	12.3
Female	61.4	56-65	34.9
Ethnicity		66-75	30.8
Non-Hispanic	91.7	76-85	18.6
Hispanic	8.3	≥ 86	3.4
Race		Marital Status	
White	81.2	Married	59.6
Other	18.6	Not Married	40.4
Education		Wealth	
Less than High School	14.3	< $1307.15	14.2
High School	32.6	$1307.15- 33,257.14	14.4
Some College	26.8	$33,257.15- 102,642.86	14.2
College Graduate	12.0	$102,642.87- 206,171.43	14.4
Post College	14.3	$206,171.44- 386,357.14	14.2
		$386,357.15- 726,428.57	14.4
		> $726,428.57	14.2

Note. Education and socioeconomic measures had missing data for some participants N= 669 and N=458 respectively

Table 2

Correlation Matrix

Variables	*M*	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	0.39	0.487												
2. Ethnicity	0.92	0.276	.018											
3. Race	0.81	0.39	.082*	.121**										
4. Education	13.22	2.77	-.009	.327**	.063									
5. Age	67.17	9.79	.080*	.127**	.184**	-.088*								
6. Marital Status	0.6	0.491	.219**	-.094*	.140**	.056	-.064							
7. Wealth	375,110.19	701,531.32	.155**	.187**	.358**	.402**	.250**	.302**						
8. Health Conditions (2012)	3.51	2.11	-.128**	.039	.046	-.151**	.293**	-.143**	-.162**					
9. PAD (2012)	2.12	0.81	.019	-.081*	-.169**	-.098*	-.226**	-.093*	-.294**	.076*				
10. Self-Efficacy (2012)	4.50	1.11	.046	.035	-.024	.199**	-.046	.059	.171**	-.202**	-.224**			
11. SPA (2016)	3.44	0.97	.000	.026	-.094*	.190**	-.197**	.071	.032	-.302**	-.144**	.338**		
12. Health Conditions (2016)	3.96	2.10	-.038	-.003	.013	-.147**	.238**	-.125**	-.190**	.793**	.111**	-.194**	-.366**	
13. Life Satisfaction (2016)	4.76	1.48	.005	-.039	.069	.138**	.054	.174**	.224**	-.199**	-.200**	.298**	.374**	-.226**

Note. Cells report Pearson's correlation coefficients. Gender, Ethnicity, Race, and Marital Status are coded as dichotmous in which male=1, female=0; Non-Hispanic=1, Hipsanic=0, White=1, Other=0; married=1, not married=0.

*p < .05, two-tailed. **p < .01, two-tailed.

Table 3

Model 4 Coefficients for Health Outcomes

		Consequent						
		M (SPA)				*Y* (HO)		
Antecedent		Coeff.	*SE*	*p*		Coeff.	*SE*	*p*
X (PAD)	*a*	-.191	.055	<.001	*c'*	-.068	.076	.37
M (SPA)		—	—	—	*b*	-.308	.065	<.001
Constant	i_M	4.711	.442	<.001	i_Y	2.288	.672	<.001
		$R^2 = .161$				$R^2 = .675$		
		$F(9,442) = 9.416, p < .001$				$F(10,441) = 91.376, p < .001$		

Note. Perceived Age Discrimination (PAD) is reflected at Time 1. Self-Perceptions of Aging (SPA) and Health Outcomes (HO) are reflected at Time 2.

Table 4

Model 4 Coefficients for Life Satisfaction

		Consequent						
		M (SPA)				*Y* (LS)		
Antecedent		Coeff.	*SE*	*p*		Coeff.	*SE*	*p*
X (PAD)	*a*	-.191	.055	<.001	*c'*	-.062	.081	.444
M (SPA)		——	——	——	*b*	.572	.069	<.001
Constant	i_M	4.711	.442	<.001	i_Y	.921	.716	.199
		$R^2 = .161$				$R^2 = .228$		
		$F(9,442) = 9.416, p < .001$				$F(10,441) = 12.987, p < .001$		

Note. Perceived Age Discrimination (PAD) is reflected at Time 1. Self-Perceptions of Aging (SPA) and Life Satisfaction (LS) are reflected at Time 2.

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