Published in final edited form as:

Educ Gerontol. 2020 ; 46(9): 563–574. doi:10.1080/03601277.2020.1790103.

Correlates of Dementia-related Anxiety: Self-Perceived Dementia Risk and Ageism

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Abstract

As public awareness of and exposure to Alzheimer's disease and related dementias (ADRD) have increased worldwide, the fear of developing ADRD, or dementia-related anxiety (DRA), is expected to increase as well. It was hypothesized that at least part of what makes dementia so anxiety provoking, is the association of ADRD with older adults, an often stigmatized group. To test this hypothesis, two online studies examined how ageist beliefs contribute to DRA; the roles of ADRD-related factors, such as self-perceived risk and personal exposure, were also examined. Study 1 included university students ($n = 295$, age range: 18 to 58 years, $M_{age} = 21.16$, $SD_{age} = 4.85$) to determine what factors may contribute to young adults' DRA. Study 2 included adults of all ages ($n = 352$, age range: 18 to 81 years, $M_{age} = 37.85$, $SD_{age} = 12.88$) to determine whether Study 1 results were replicable among adults of all ages. Hierarchical multiple regressions were used. Results from both studies demonstrated that being female and having higher self-perceived ADRD risk and benevolent ageism uniquely explicated higher levels of DRA. Within Study 2, significant effects of both benevolent and hostile ageism were observed, suggesting that diverse negative attitudes toward older adults are associated with DRA. It is possible that strong ageist attitudes stigmatize older adults as those who are forgetful and this may contribute to DRA, as age is a major risk factor for developing dementia. Study limitations and directions for future research are discussed.

Keywords

benevolent ageism; hostile ageism; self-perceived dementia risk; dementia-related anxiety

In the United States, there are over 47.8 million people over the age of 65 (U.S. Census Bureau, 2017), and among older adults, an estimated 5.7 million people have been diagnosed with Alzheimer's disease (AD; Alzheimer's Association, 2018). The population of older adults is increasing, and the prevalence of Alzheimer's disease and related disorders (ADRD) is rising as well. According to the United Nations' World Population Ageing Report in 2015, 46.8 million people around the world are living with dementia, and by 2050, it is expected that more than 131.5 million people will be affected by dementia. As exposure to ADRD and awareness that dementias are often progressive and irreversible increase, concern about developing ADRD (dementia-related anxiety; DRA) is expected to increase as well (Corner & Bond, 2004).

Although DRA might be seen initially as a concept that is only applicable to middle-aged and older adults, for whom ADRD diagnoses might be more personally salient, the term refers to the concern about the possibility of developing dementia among people of all ages or cognitive status (Kessler, Bowen, Baer, Froelich, & Wahl 2012). In fact, AD has been identified as the most feared disease by about 31% of adults in the United States, according to a survey conducted by MetLife Foundation (2011); only cancer was more frequently identified as most feared (41% of adults). Likewise, in an online survey conducted in the United Kingdom in 2011, more than 68% of respondents indicated AD was their most feared health condition, followed by cancer (27%) and death (18%). Interestingly, fear about ADRD was not specific to older adults, with more than half of the 2,000 survey respondents between the ages of 30 and 50 (Alzheimer's Research UK, 2011). Other research studies have also supported this negative relationship between age and DRA (Cutler, 2015; Yun, 2019).

So, *what makes people worried about developing dementia in the future?* Even in the absence of ADRD, people often worry about loss of cognitive abilities as they age, likely due to inevitable age-related cognitive decline that occur in adulthood (Park, O'Connell, & Thomson, 2003) and the strong negative biases generally associated with older adults (Cuddy, Norton, & Fiske, 2005). Nosek, Banaji, and Greenwald (2002) reported that firmly embedded age-related stereotypes are prevalent across different groups of people. Ageism is unique among the -isms in that everyone ages with time (assuming evasion of premature death), and as a result, most people experience ageism (Palmore, 2003). Furthermore, most of the negative attitudes towards aging are related to cognitive abilities of older adults, and these negative attitudes can occur even without any indication of cognitive decline (Cuddy et al., 2005; Nosek et al., 2002; Whitbourne & Seed, 2002), and age is, indeed, the biggest risk factor for dementia (Chen, Lin, & Chen, 2009). Thus, ADRD may be "feared" by many people (even young adults) because aging is inevitable, and older adults are often associated with negativity and lowered cognitive function.

In a study conducted in Ireland, McParland, Devine, Innes, and Gayle (2012) found negative attitudes towards people with dementia amongst adults of all ages, particularly with the loss of self-identity and independence. Therefore, based on the existence of strong implicit negative biases against older adults observable in adults of all ages (Nosek et al., 2002), culturally embedded age-related stereotypes (Cuddy et al., 2005), and dementia-related stigma (Moniz-Cook & Manthorpe, 2009; Prince, Bryce, & Ferri, 2011), DRA is likely to be exacerbated. Many ageist stereotypes suggest older adults have difficulties with cognitive impairment, which may contribute to DRA, particularly among those who believe they are at greater risk for developing ADRD in the future.

As with any prejudice, ageism may include both hostile and benevolent responses to and evaluations of the target (Cary, Chasteen, & Remedios, 2016). Whereas hostile ageism can be easily detected by people (Cherry & Palmore, 2008; Marti, Bobier, & Baron, 2000), benevolent ageism is less frequently considered in investigations of the detrimental effects of ageism. Indeed, benevolent ageism may not be as visible because of the positive relationship between positive ageist beliefs and social desirability (Cherry, Allen, Denver, & Holland, 2015). Benevolent ageism reflects beliefs that older adults are low in competence (less

capable and able compared to young adults) but high in warmth (Cuddy & Fiske, 2002; Cuddy et al., 2009; Cuddy et al., 2005; Fiske, Xu, Cuddy, & Glick, 1999). As a result, they are often viewed as individuals to be pitied due to their vulnerability and lack of competence (Cuddy et al., 2005; Fiske, Cuddy, Glick, & Xu, 2002). Although generally seen as more “positive” and less threatening than overt or hostile ageism, benevolent ageism appears to have significant negative effects on older adults’ physical and mental health, especially if they internalize these stereotypes of being “warm and incompetent” and feel a lack of self-control from over-accommodation (Cary et al., 2016; Langer, & Rodin, 1976). More importantly, studies have pointed out that both “positive” and “negative” forms of ageism are essentially categorizing older adults and creating specific expectations; when these “ideals” are met, there are consequences for older adults (Chen, 2018; Cherry & Palmore, 2008).

Besides age, family history of dementia has been acknowledged as a strong predictor of ADRD diagnosis, particularly for AD (Cutler & Hodgson, 2001; Ostergren, Heeringa, Leon, Connell, & Roberts, 2017; Roberts & Connell, 2000). Those who have a family member diagnosed with AD and know that there is a hereditary component for the disease might experience more DRA. For instance, multiple studies have found that those with family history of AD (Cutler & Hodgson, 2001; Ostergren, Heeringa, Leon, Connell, & Roberts, 2017; Roberts & Connell, 2000) and/or experience with caregiving for someone with AD (Cantegreil-Kallen & Pin, 2012; Suhr & Kinkela, 2007), report greater fear of developing AD in the future. Similarly, studies on genetic susceptibility testing for AD have shown that there is a strong association between family history and genetic risk factor for AD on self-perceived risk of the disease (Hiraki, Chen, Roberts, Cupples, & Green, 2008; Larusse et al., 2005). People who have greater exposure to ADRD might be more susceptible to DRA, as they have observed and been personally impacted by more negative symptoms and aspects related to a dementia diagnosis, such as a family member’s loss of independence and changes in their sense of self.

Study 1 focused on identifying factors related to DRA, particularly among young adults. Specifically, the study examined the relationships among some demographic variables (age, gender, education, and relationship status), self-perceived risk for dementia, exposure to ADRD, ageism, and DRA. Due to previous research indicating that higher exposure to ADRD is linked with greater concern of developing ADRD in the future (Cantegreil-Kallen & Pin, 2012; Cutler & Hodgson, 2001; Ostergren et al., 2017; Roberts & Connell, 2000; Suhr & Kinkela, 2007), it was hypothesized that participants with genetic exposure to dementia will report higher DRA compared to those with no ADRD exposure. Moreover, it was predicted that participants with genetic dementia exposure will yield higher levels of DRA compared to those with non-genetic ADRD experiences based on a similar finding by Kinzer and Suhr (2016). Self-perceived risk was also hypothesized to be significantly related to one’s level of DRA – that those who perceive themselves as having higher likelihood of developing ADRD in the future will also report higher levels of DRA. Lastly, it was expected that participants who endorse more ageist attitudes – both hostile and benevolent – will endorse higher levels of DRA. This relationship was expected based on the ageist and stereotypical association of older adults with loss of cognitive abilities; we therefore reasoned that individuals endorsing greater levels of ageism would endorse greater levels of anxiety about diagnoses associated with older individuals.

Study 1

Study 1 involved participants from an online undergraduate research participation platform (SONA) and addressed the initial research questions: whether young adults' ageism was associated with their DRA. As noted, DRA research studies have primarily included middle-aged and older adults, where DRA might be most salient and applicable, as ADRD risk, as well as ADRD exposure and experiences increase with age. However, recent studies have also demonstrated a negative relationship between age and DRA (Cutler, 2015; Yun, 2019). This study investigated what may be fueling DRA among younger participants, for whom dementia is not typically an immediate concern.

Method

Participants

Participants of age 18 or older were invited to participate in the study. Of the 375 participants recruited, 295 participants (78.7%) met criteria for inclusion in data analysis. Eighty participants were excluded for one of four reasons: dropping out of the study partway and not answering all the questions ($n = 19$), being under 18 years old ($n = 1$), missing more than one attention check ($n = 52$), or being an outlier on the main dependent variable ($n = 8$). Participants received one credit for undergraduate psychology courses.

Participants in the final sample were between the ages of 18 to 58 ($M = 21.16$, $SD = 4.85$) and on average had 14.01 years of education ($SD = 1.73$). Most participants were female ($n = 247$, 83.7%), identified as non-Hispanic ($n = 235$, 79.7%), Caucasian ($n = 250$, 84.7%), not in a relationship ($n = 223$, 75.6%), and reported English as their first language ($n = 282$, 95.6%). Additional descriptive statistics and correlations for the primary measures such as AAS, exposure to dementia, and DWS are presented in Table 1.

Procedure

Participants aged 18 and older were recruited via an online research management system. Participants read a brief description, introducing the study as an examination of adults' personality and their dementia-related attitudes and knowledge, as additional measures of personality, locus of control, dementia literacy, and interest in ADRD testing were included as part of a larger project. The study description did not mention ageism and dementia-related anxiety to minimize the risk of influencing participants' responses.

After providing informed consent, participants completed the study online, using Qualtrics software. The study took approximately 20 to 40 minutes to complete. Participants were then provided with a thorough written debriefing regarding the nature of the study and were compensated with one psychology class credit in exchange for their participation.

Measures

Additional measures were included as part of a larger project, but are not reported for the purposes of this study.

Ambivalent Ageism Scale.—Ageism was measured using the Ambivalent Ageism Scale (AAS; Cary et al., 2017), a 13-item assessment designed to examine participants' prejudice or discrimination against older adults. Participants were instructed to indicate their agreement with each statement using a seven-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The scale has two subscales: benevolent ageism (i.e., "it is good to tell old people that they are too old to do certain things; otherwise they might get their feelings hurt when they eventually fail"; $\alpha = .83$) and hostile ageism (i.e., "old people are a drain on the health care system and the economy"; $\alpha = .76$). Higher scores reflect higher levels of ageism.

Personal exposure to dementia.—To briefly assess personal exposure to ADRD, participants answered five yes or no questions (i.e., "I know or have known someone with Alzheimer's disease or another type of dementia."), which were adapted from Kinzer and Suhr's (2016) exposure measure. Participants' ADRD exposure was coded as 0 (no exposure; $n = 73$, 24.7%), 1 (non-genetic exposure; $n = 34$, 11.5%), or 2 (genetic exposure; $n = 188$, 63.7%). Because there is a hereditary component to some types of dementia (Alzheimer's Association, 2018), genetic and non-genetic dementia exposure were coded separately. If participants had both genetic and non-genetic experiences, it was coded as a genetic experience, as previous studies have shown genetic exposure to be more significant and compared to non-genetic exposure. Indeed, Kinzer and Suhr (2016) reported that adults with genetic exposure report higher DRA than individuals with non-genetic exposure.

Dementia-related Anxiety.—DRA was assessed using a version of the Dementia Worry Scale (DWS; Kinzer & Suhr, 2016) modified to include AD. This 12-item measure assessed participants' level of concern about developing ADRD. Respondents indicated their agreement with each statement (i.e., "I know I shouldn't worry about developing Alzheimer's disease or other forms of dementia, but I just cannot help it") using a five-point Likert scale from 1 (*not at all typical of me*) to 5 (*very typical of me*). Higher scores reflected higher levels of DRA. DWS items demonstrated good internal reliability for this sample ($\alpha = .87$).

Social Desirability.—Participants often do not outright report perceptions towards aging and older adults (Cherry et al., 2015); therefore, a 13-item short version of the Marlowe-Crowne Social Desirability Scale (Reynolds, 1982) was included to assess the tendency to present in an overly positive, socially desirable manner. Participants indicate whether each statement (i.e., "I have never deliberately said something that hurt someone's feeling") is true or false for them personally. A total sum score was calculated; higher scores indicate greater desirability to be seen in a socially acceptable and positive manner. The items in the scale displayed poor internal reliability ($\alpha = .64$).

Attention Checks.—In addition to the questionnaires listed above, three attention checks were dispersed throughout the study. Checks were included to increase confidence that participants were paying attention to the task and following instructions, as the study was conducted online and the environment in which the participants answered these questions were unclear (i.e., a quiet room by themselves vs. in a loud café with multiple people).

Demographics and contextual characteristics.—Participants reported demographic information including age, gender, race, ethnicity, education level, relationship status, income, overall health, religious beliefs, and self-perceived risk of being diagnosed with any type of dementia in the future from 1 (*no risk at all*) to 5 (*very high risk*).

Results

Descriptive statistics were calculated to characterize the sample, including the primary variables of interest (DWS, AAS, and ADRD-related measures); see Table 1. A hierarchical multiple regression with three blocks (block 1: demographics – age, gender, education, and relationship status, block 2: ADRD factors – self-perceived risk and exposure to dementia, and block 3: ageism – benevolent and hostile ageism and social desirability) was computed to examine the relationships between the demographics variables, ADRD factors, ageism, and DRA. Social desirability was included with the measures of ageism (or block 3) for the regression model; although it is not a direct measure of ageism, social desirability and benevolent ageism are correlated (Cherry et al., 2015). The inclusion of social desirability allowed for statistical control for the tendency to respond in a socially desirable manner, particularly given the relationship between benevolent ageism and social desirability. Results are presented in Table 2.

The first model (demographics: age, gender, education, and relationship status) explained 2.7% of the total variance in DRA, $F(4, 284) = 1.97$, n.s. DRA was not predicted by participants' age, relationship status, or education, $ps > .05$, n.s. However, being female was associated with significantly higher DRA. The ADRD factors block explained an additional 4.9% of the variance (beyond the demographics block) in DRA, $F_{change}(2, 282) = 7.50$, $p < .01$. The second model (demographics and ADRD factors) accounted for 7.6% of the total variance in DRA, $F(6, 282) = 3.87$, $p < .01$. Specifically, being female and having higher ratings of self-perceived risk for dementia uniquely predicted greater levels of DRA. Lastly, the ageism block explained an additional 5.1% of the variance (beyond the ADRD factors block) in DRA, $F_{change}(3, 279) = 5.41$, $p < .01$. The third model (demographics, ADRD factors, and ageism) accounted for 12.7% of the total variance in DRA, $F(9, 279) = 4.50$, $p < .001$. The regression analysis revealed that being female, having higher self-perceived risk for dementia and benevolent ageism, and reporting lower social desirability significantly predicted greater levels of reported DRA.

Additionally, a one-way ANOVA was run to determine whether mean level of DRA differed as a result of ADRD exposure (0 = no dementia exposure, 1 = non-genetic exposure, and 2 = genetic exposure). Group differences as a result of ADRD exposure did not reach statistical significance, $F(2, 292) = 2.89$, $p = .06$. However, because the result was nearly significant, Fisher's least significant difference post hoc tests were conducted to test the hypothesis that DRA was significantly greater among those with genetic exposure compared to those with no dementia exposure. Participants without dementia exposure ($M = 1.35$, $SD = .41$) reported significantly lower level of DRA compared to those with genetic exposure ($M = 1.50$, $SD = .46$), $p < .05$. Participants with non-genetic exposure ($M = 1.48$, $SD = .47$) did not significantly differ from those without exposure ($p = .16$). Participants with genetic and non-genetic dementia exposure did not differ in reported DRA ($p = .85$).

Discussion

Overall, the results suggest that being female, having higher ratings of self-perceived risk and benevolent ageism, and lower social desirability explicated higher scores of DRA. Additionally, individuals with genetic exposure to dementia reported greater DRA compared to those with no dementia exposure. Participants' hostile ageism was unrelated to the level of DRA, suggesting there may be a unique relationship between young adults' DRA and benevolent ageism – positive ageism or patronizing ageism. However, it is noted that the majority of the sample was female (83.7%), and undergraduate students at a public university ($M_{age} = 21.16$), potentially limiting the generalizability of the results.

Study 2

The same study including a sample of online participants through Amazon's Mechanical Turk (MTurk) service was conducted to determine whether ageism and self-perceived ADRD risk were similarly associated with DRA in a sample of adults across the life span.

Method

Participants

A total of 375 participants of age 18 or older were recruited to participate in Study 2. Twenty-three participants were excluded for one of three reasons: stopping the study early and not answering all the questions ($n = 8$), missing more than one attention check ($n = 12$), or being an extreme outlier on the main dependent variable ($n = 3$). A total of 352 participants (93.9%) were included in data analysis. Participants were awarded one dollar for their time and effort.

Participants in the final sample were aged 18 to 81 ($M = 37.85$, $SD = 12.88$) and had an average of 14.83 years of education ($SD = 1.87$). Female participants made up more than half of the sample ($n = 201$, 57.1%), and there were relatively equal numbers of participants who were not in a relationship ($n = 168$, 47.7%) and in a relationship ($n = 182$, 51.7%). Most participants identified as non-Hispanic ($n = 307$, 87.2%), Caucasian ($n = 283$, 80.4%), and reported English as their first language ($n = 348$, 98.9%). Additional descriptive statistics on participants' responses on the AAS, exposure to dementia, and DWS measures are presented in Table 3.

Procedure

Procedures for Study 2 were identical to Study 1, with the exception that participants were recruited using MTurk instead of SONA. Thus, instead of being compensated with one psychology class credit at the end of the study, participants were awarded one dollar. On average, participants took approximately 15 to 20 minutes to complete the study.

Measures

As in Study 1, measures included AAS ($\alpha s = .80 - .87$), personal exposure to ADRD questionnaire, DWS ($\alpha = .95$), and the short version of the Marlowe-Crowne Social

Desirability Scale ($\alpha = .80$); all displayed good to excellent internal consistency. The same demographic information was collected and same attention checks were used.

Results

As in Study 1, after descriptive statistics were calculated on the primary measures, a hierarchical multiple regression with three blocks (block 1: demographics – age, gender, education, and relationship status, block 2: ADRD factors – self-perceived risk and exposure to dementia, and block 3: ageism – benevolent and hostile ageism and social desirability) was computed to examine the relationships between the demographics variables, ADRD factors, ageism, and DRA. Results are presented in Table 4.

The first model (demographics: age, gender, education, and relationship status) explained 4.1% of the total variance in DRA, $F(4, 344) = 4.69, p < .01$. DRA was not predicted by participants' gender, education, or relationship status, $ps > .05$, n.s. However, younger age was significantly associated with higher DRA. The ADRD factors block explained an additional 11.5% of the variance (beyond the demographics block) in DRA, $F_{change}(2, 342) = 23.51, p < .001$. The second model (demographics and ADRD factors) accounted for 16.6% of the total variance in DRA, $F(6, 342) = 7.16, p < .001$. Specifically, younger age and higher self-perceived risk for dementia uniquely predicted greater levels of DRA. Lastly, the ageism block explained an additional 12.1% of the variance (beyond the ADRD factors block) in DRA, $F_{change}(3, 339) = 19.27, p < .001$. The third model (demographics, ADRD factors, and ageism) accounted for 28.8% of the total variance in DRA, $F(9, 339) = 15.22, p < .001$. The regression analysis revealed that women and those reporting greater self-perceived ADRD risk, benevolent ageism, and hostile ageism reported greater levels of DRA.

In addition, a one-way ANOVA was used to determine whether there is a main effect of type of ADRD exposure (0 = no dementia exposure, 1 = non-genetic exposure, and 2 = genetic exposure) on participants' mean level of DRA. The main effect of dementia exposure on DRA was not significant, $F(2, 349) = 1.87, p = .16$. The mean level of DRA reported by those with no exposure ($n = 83, M = 1.79, SD = .86$) was not significantly different than the mean amount of DRA reported by those with non-genetic ($n = 25, M = 1.83, SD = .68$) and genetic exposure ($n = 244, M = 1.99, SD = .87$).

Discussion

Similar to the results from Study 1, Study 2 regression analyses suggested that being female, having higher ratings of self-perceived risk and benevolent ageism uniquely explicated higher levels of DRA. Compared to Study 1, however, Study 2 demonstrated significant effects of both types of ageism, suggesting that any negative attitudes toward older adults can influence and yield higher worries for ADRD across all ages. Unlike Study 1, social desirability was not associated with greater DRA, though younger age was.

General Discussion

Findings demonstrate significant effects of gender, self-perceived dementia risk, and ageism on DRA. More specifically, in Study 1, being female and having lower social desirability and higher ratings of self-perceived risk and benevolent ageism predicted higher scores of DRA, whereas in Study 2, being female, younger, having higher ratings of self-perceived risk and both hostile and benevolent ageism uniquely explicated higher levels of DRA. No significant effects of education, relationship status, and ADRD exposure type were found within either sample. Hypotheses regarding significant relationships between self-perceived risk, ageism, and DRA were generally supported. The lack of significant difference in DRA between those with and without genetic ADRD exposure is inconsistent with previous literature showing that having a family member with AD (Cutler & Hodgson, 2001; Ostergren et al., 2017; Roberts & Connell, 2000) and caregiving for someone with AD (Cantegreil-Kallen & Pin, 2012; Suhr & Kinkela, 2007) are associated with greater levels of DRA. Although in Study 1, individuals with genetic ADRD exposure reported higher levels of DRA compared to individuals with no exposure, the hypothesis that those with genetic exposure would report greater DRA compared to individuals with non-genetic and no exposure was not supported in Study 2. It is not clear why our findings do not align with previous studies but is notable that participants in the present studies reported generally a low level of DRA ($M_{study1} = 1.50$ and $M_{study2} = 1.96$); perhaps lower overall concerns about developing ADRD in the future contributed to the lack of group differences.

Previous studies have revealed that many people hold strong negative attitudes toward older adults, especially in regards to their memory ability (Cuddy et al., 2005; Nosek et al., 2002; Whitbourne & Seed, 2002), and there is stigma associated with dementia diagnoses (Moniz-Cook & Manthorpe, 2009; Prince, Bryce, & Ferri, 2011). Ageism has been found across cultures (Cuddy & Fiske, 2002; Vaclair, Hanke, Huang, & Abrams, 2017), suggesting that strong ageist values are prevalent among different groups of people. It is possible that strong ageist attitudes stigmatize older adults as those who are cognitively impaired and this may in turn contribute to DRA, as having a diagnosis associated with older people is likely to be particularly anxiety-provoking for individuals with ageist beliefs. DRA appears to be at least partially fueled by ageist beliefs. The line between ageism and dementia-related stigma (or fear) may become less clear as people age, raising the question of whether general fear of aging or more specific fear of dementia are distinct age-related challenges.

The difference in the outcomes regarding the relationships between ageism and DRA in Study 1 and Study 2 is difficult to understand at this point. For young adults ($M_{age} = 21.16$) currently enrolled as undergraduate students at a public university ($M_{education} = 14.01$ years), hostile or outright ageism did not play a significant role in predicting their level of DRA. Instead, benevolent, or patronizing, ageism was an important factor in explaining undergraduates' DRA. This result aligns with literature revealing young adults' tendency to describe older adults as high in warmth but low in competence (Cuddy & Fiske, 2002; Cuddy et al., 2009; Cuddy et al., 2005; Fiske et al., 1999) and supports the mixed nature of age-related stereotypes, in which older adults are often pitied for their lack of competence (i.e., physical ability, memory, independence, etc.), yet valued for their perceived warmth (Cuddy et al., 2005; Fiske et al., 2002). Multiple studies have also found that people are

more likely to admit positive ageism compared to negative ageism, which may explain the association between social desirability and self-reported ageism questionnaires (Allen, Cherry, & Palmore, 2009; Cherry et al., 2015; Papadaki, Plotnikof, & Papadaki, 2011). In fact, Cherry and colleagues (2015) found a small but significant correlation between social desirability and self-reported ageism. Similarly, the results from the current studies demonstrated small but significant negative correlations between social desirability and hostile ageism, suggesting that those who reported tendency toward socially desirable responses also reported less hostile ageism, perhaps in an effort to be socially compatible and normative. On a broader note, in Study 2, the results showed that both types of ageism – positive and negative – were significantly related to DRA. Perhaps for the general public (rather than university undergraduates), any biased attitudes toward older adults yield higher worries for ADRD.

The present studies are not without limitations. One possible limitation is the disproportionate number of participants identifying as Caucasian and Non-Hispanic in the study (more than 80% of participants in both studies). Additionally, for Study 1, 83.7% of the sample identified as female, potentially limiting the generalizability of the results. More efforts should be placed in the future in recruiting greater numbers of participants from different demographic groups to have more representative samples and generalizable findings. For instance, in a cross-cultural study with Chinese, deaf American, and hearing American participants, Levy and Langer (1994) found that Chinese and deaf Americans reported more positive views about aging compared to hearing Americans and that they performed significantly better in the memory test, demonstrating the potential cultural effects on the perception of older adults and their memory performance. Conversely, as mentioned previously, there is evidence to suggest that ageism exists cross-culturally (i.e., Cuddy & Fiske, 2002; Vauclair et al., 2017). Inclusion of diverse samples would allow for confirmation (or repudiation) of similar patterns across groups. Another limitation is the inability to determine causality from the data due to correlational design. These correlational studies investigated relationships between variables at a single point in time. Therefore, the results cannot address causality between factors of interest to DRA. We cannot be sure if higher levels of ageism lead to greater levels of DRA or vice versa. Future studies could use longitudinal and experimental methods to test how ageism can cause an individual's level of DRA to increase or decrease.

Despite these limitations, the studies offer preliminary findings regarding different types of ageism, particularly how benevolent ageism might be related to DRA. Though “positive” ageism may initially seem harmless, awareness of one's own beliefs about older adults, even if they may seem “positive” (Cuddy & Fiske, 2002; Cuddy et al., 2009; Cuddy et al., 2005; Fiske et al., 1999; Fiske et al., 2002), is arguably important in understanding attitudes and expectations for one's personal aging process. Any type of ageism, regardless of whether it is “positive” or “negative” can have detrimental effects on older adults through stereotyping, especially when the older adult does not “fit” certain characteristics that are imposed, such as being a “warm and caring” grandmother (Chen, 2015; Cherry & Palmore, 2008). Not only are ageist beliefs related to higher levels of DRA, but ageist, paternalistic behaviors can negatively affect older adults' well-being. In an early example, Kemper and colleagues (1995) found that using elderspeak, or making simpler speech adjustments for older adults,

can generate feelings of incompetence and lowered self-esteem among older adults. Reducing ageist behaviors and beliefs could have positive outcomes of diverse kinds, perhaps one of which would be lower levels of DRA.

In conclusion, these data highlight the importance of continuing to examine correlates of DRA across all ages, as this phenomenon is a rising issue both clinically and socially due to the growing numbers of older adults (U.S. Census Bureau, 2017) and people directly and indirectly affected by dementia (Alzheimer's Association, 2018; United Nations, Department of Economic and Social Affairs, Population Division, 2015). Particularly, the studies demonstrate that ageism is significantly related to DRA, as people may not adequately distinguish between older adults and those with ADRD. Future studies and efforts can focus on identifying modifiable characteristics associated with ageist attitudes and DRA, with the goal of informing future intervention-based research.

Acknowledgments

Funding

This work was partially supported by the National Institute on Aging under Grant #1R21AG052820-01A1 and the College of Letters, Arts & Sciences under the Student-Faculty Research/Creative Works Award.

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Table 1

Study 1 Participant Characteristics and Correlations Between Primary Measures

Primary Variables	Possible Range	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. DWS	1–5	1.46	0.45	1.00	.21**	.13*	.15*	.11	–.16**
2. Self-Perceived Risk	1–5	2.17	0.95	--	1.00	.28**	–.14*	–.06	–.12*
3. Exposure to Dementia	0–2	1.38	0.86	--	--	1.00	.01	–.04	–.05
4. Benevolent Ageism	1–7	2.76	0.94	--	--	--	1.00	.50**	–.05
5. Hostile Ageism	1–7	2.61	1.07	--	--	--	--	1.00	–.17**
6. Social Desirability	1–13	6.12	2.61	--	--	--	--	--	1.00

*
 $p < .05$.**
 $p < .01$.***
 $p < .001$.*Note.* DWS = Dementia Worry Scale

Table 2

Study 1 Hierarchical Regression Model Predicting Dementia-related Anxiety

Block	Predictor	Model 1		Model 2		Model 3	
		B	β	B	β	B	β
Demographics	Age	−0.00	−.03	−0.01	−.07	−0.00	−.03
	Gender	0.19	.15 *	0.16	.13 *	0.18	.15 *
	Education	0.00	.02	0.00	.02	0.01	.04
	Relationship Status	0.04	.04	0.02	.02	0.02	.02
ADRD Factors	Self-Perceived Risk			0.10	.21 **	0.10	.22 ***
	Exposure to Dementia			0.03	.05	0.02	.04
Ageism	Benevolent Ageism					0.08	.17 *
	Hostile Ageism					0.02	.04
	Social Desirability					−0.02	−.12 *
R ²			.03		.08		.13
Adjusted R ²			.01		.06		.10
R ² change			.03		.05 **		.05 **

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

Table 3

Study 2 Participant Characteristics and Correlations Between Primary Variables

Primary Variables	Possible Range	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. DWS	1–5	1.93	0.86	1.00	.33**	.10	.36*	.35*	-.14*
2. Self-Perceived Risk	1–5	2.60	0.90	--	1.00	.28**	-.02	-.02	-.10
3. Exposure to Dementia	0–2	1.46	0.85	--	--	1.00	-.03	-.03	.00
4. Benevolent Ageism	1–7	2.84	1.17	--	--	--	1.00	.67**	-.03
5. Hostile Ageism	1–7	2.53	1.23	--	--	--	--	1.00	-.15**
6. Social Desirability	1–13	6.15	3.38	--	--	--	--	--	1.00

*
 $p < .05$.**
 $p < .01$.***
 $p < .001$.*Note.* DWS = Dementia Worry Scale

Table 4

Study 2 Hierarchical Regression Model Predicting Dementia-related Anxiety

Block	Predictor	Model 1		Model 2		Model 3	
		B	β	B	β	B	β
Demographics	Age	−0.01	.20***	−0.01	−.21***	−0.00	−.02
	Gender	0.11	.06	0.06	.03	0.17	.21*
	Education	−0.03	−.06	−0.02	−.04	−0.01	−.08
	Relationship Status	0.08	.05	0.00	.00	0.01	.24
ADRD Factors	Self-Perceived Risk			0.32	.34***	0.32	.33***
	Exposure to Dementia			0.03	.03	0.01	.01
Ageism	Benevolent Ageism					0.17	.23**
	Hostile Ageism					0.13	.18**
	Social Desirability					−0.02	−.07
R ²			.05		.17		.29
Adjusted R ²			.04		.15		.27
R ² change			.05**		.12***		.12***

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