Insecurity About Getting Old: Age-Contingent Self-Worth, Attentional Bias, and Well-Being

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Abstract

Objectives: Older adulthood has often been recognized as a time of increased well-being and positive cognitive biases. However, older adults can also experience many social and identity challenges. We sought to investigate which older adults might be most vulnerable to these difficulties. We propose that to the extent an older adult has *age-related contingent self-esteem* they will be at risk for lower well-being and negative attentional biases.

Methods: Across three studies, we measured older adults' self-reported aging self-worth contingencies, as well as various measures of well-being including subjective stress. We then had participants complete a cued-dot probe task, where each trial either began with an aging threat or not.

Results: In an initial pilot study, we found that older adults reporting specific cognitive decline contingencies held an attentional bias toward rejection, primarily when cued with the word *senile*. In Study 1, we found general aging contingencies to be associated with lower well-being and a rejection bias when cued with *old*. In Study 2, we found that a stronger rejection bias, particularly when cued with *old*, was associated with greater stress.

Conclusions: These findings demonstrate that older adults who are insecure about aging may have lower well-being and negatively biased social cognitive patterns. Negatively biased attentional patterns may play a key role in maintaining feelings of insecurity. Importantly, our research sheds light on those older adults who may not experience a positivity effect.

Keywords: attentional bias; older adults; rejection; self-worth contingency; well-being

Insecurity About Getting Old: Age-Contingent Self-Worth, Attentional Bias, and Well-Being

Older adults have been found to report, on average, generally high levels of well-being (e.g., Carstensen & DeLiema, 2018; Carstensen, Pasupathi, Mayr, & Nesselroade, 2000). This positive frame of mind is accompanied by supportive biases in social information processing: For instance, compared to their younger counterparts, older adults tend to show attentional biases toward positive rather than negative stimuli (Allard, Wadlinger, & Isaacowitz, 2010; Kennedy, Mather & Carstensen, 2004; Reed, Chan, & Mikels, 2014). Indeed, older adults' bias toward positive stimuli is so well-recognized that the term *positivity effect* has been coined to capture the phenomenon.

Such a positive outlook is notable given that aging can also introduce many challenges: Some older adults have been shown to be troubled by not only concerns about cognitive decline (Werner, 2002), reduced independence (Wagner, Hoppman, Ram, & Gerstorf, 2015) and financial strain (McMullin & Cairney, 2004), but also a host of particular social challenges including loneliness (Hawley & Kocherginsky, 2018; Oberhauser, Neubauer, & Kessler, 2017), stigmatization (Chasteen & Cary, 2015), and decreased community engagement (Robertson & Kenny, 2016).

Given these contradictory views on the experience of aging, it is crucial to identify and understand *which* older adults in particular might be vulnerable to having more negative psychological outcomes rather than experiencing the positivity effect exhibited by many of their peers. We hypothesize that one factor creating such a psychological vulnerability is insecurity about aging per se, such that a person associates growing old with a loss in self-perceived and socially-reflected value. Given the prevalence of ageist attitudes and widespread negative stereotypes of older people (Butler, 1969; Levy, 2009), it is perhaps not surprising that some

individuals develop a sense that old age is a time of social devaluation and rejection, leading to feelings of insecurity about getting older. Indeed, experiences of ageism are related to poorer mental health in older adulthood (Lyons et al., 2017). That said, older adults can vary in the extent to which they internalize negative views of this sort (Chasteen & Cary, 2015). We propose that to the extent that an older adult cognitively anticipates and internalizes social devaluing due to their advancing age, they will be at risk for lower well-being and negativity biases.

We conceptualized insecurity about aging as a *contingency of self-worth* (Crocker & Wolfe, 2001), meaning that feelings of self-esteem are based on seeing oneself as young versus old. Crocker and colleagues originally developed and validated a measurement scale to assess self-worth contingency domains relevant among college students (Crocker, Luhtanen, Bouvrette, & Cooper, 2003), and showed that when students with high contingencies in a given domain (e.g., academic competence) experienced a setback (e.g., a rejection letter from a graduate school program) they were more negatively affected than other students with no such contingencies (Crocker, Sommers, & Luhtanen, 2002). Subsequent research has expanded on this approach to assess other specific contingency domains, for example body weight (Clabaugh, Karpinski, & Griffin, 2008) and relationship success (Knee, Canevello, Bush, & Cook, 2008). However, in the context of older adulthood, although some prior work has looked at broadly conditional self-esteem (Meier, Orth, Denissen, & Kühnel, 2011), none has examined individuals' contingencies specifically about aging. The domain of aging seems an obvious source of self-esteem insecurity due to prevailing social attitudes about old age: That is, theories of social self-esteem posit that esteem can be undermined by a threat to a personally important domain precisely because the threat signals an increased likelihood of social rejection (Baldwin & Sinclair, 1996; Leary & Downs, 1995). Thus, some older adults may come to feel badly about themselves for getting

older because they implicitly expect that they will no longer be valued or respected members of society.

There are good reasons to suspect that insecurity about aging should be associated with lower personal well-being in older adulthood. For older adults with aging contingencies of self-worth, any passing reminder of their age could represent a threat to self-esteem. Indeed, some research has found that overall self-esteem tends to decline in old age for many individuals (Orth, Erol, & Luciano, 2018; Orth, Maes, & Schmitt, 2015; Robins, Trzesniewski, Tracy, Gosling, & Potter, 2002). Moreover, greater perceptions of age discrimination are associated with lower self-esteem (Marquet, Chasteen, Plaks, & Balasubramaniam, 2018). We therefore examined links between aging-related insecurity and global self-esteem. We particularly focused on self-reported stress, as experiences of and worries about social rejection are seen as highly powerful stressors (Dickerson & Kemeny, 2004) and those with low self-esteem are more vulnerable to stressful events (DeLongis, Folkman, & Lazarus, 1988). As well, we examined a range of concerns associated with old age (e.g., cognitive decline worries, decline in physical health) which can contribute to stress.

We also investigated social cognitive patterns to shed light on psychological mechanisms associated with insecurity about aging. As noted, research suggests that older adults often display an attentional bias toward positive stimuli (e.g., Reed et al., 2014). We sought to examine whether individuals who are insecure about getting older might instead show a bias toward negative social information. We focused on attentional biases toward social rejection using a recent adaptation of the widely-used dot probe task (MacLeod, Mathews, & Tata, 1986). In the standard task the participant is briefly shown two images of faces, of which one is typically frowning. Participants are required to then identify a probe stimulus which then replaces one of the face images. The participant's degree of automatic attentional bias is calculated from the

relative speed to identify probes replacing the frowning versus neutral (or smiling) face, as this is taken as revealing their initial attentional response (MacLeod et al., 1986). Previous studies have demonstrated that individuals with anxiety (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van IJzendoorn, 2007) and low self-esteem (Dandeneau, Baldwin, Baccus, Sakellaropoulo, & Pruessner, 2007) have attentional biases toward rejecting faces. This attentional priority for critical and rejecting social cues can create the perception of a threatening social world, which can then reinforce feelings of insecurity. Indeed, negative attentional biases have been implicated in the maintenance of a range of psychological vulnerabilities (Mathews & MacLeod, 2005).

In a recent adaptation of the task, Ravary and Baldwin (2018) examined whether attentional patterns might be particularly negative when a person feels threatened. They found that when participants were shown a word related to a potential personal insecurity (e.g., *obese*), people who held relevant self-worth contingencies (e.g., about being thin) tended to show a greater attentional bias toward rejection. We adapted this approach to the question of aging insecurities, and administered to older adults a dot probe where each trial of the task began with a cue word (Fig. 1) either reflecting an aging concern or not. We hypothesized that older individuals with age-related insecurities would show attentional biases toward rejection, both generally and also particularly when confronted with an age-related threat.

[Insert Figure 1 near here]

Our overall aim was to determine whether older adults who are insecure about aging have lower levels of well-being, including greater stress, and show attentional biases toward rejection, primarily when reminded of an age-related threat. We first tested this hypothesis in a pilot study, where we examined the link between cognitive decline contingencies, well-being, and rejection under conditions of decline-related threat cues. In Studies 1 and 2, we broadened the contingency

domain to reflect aging insecurities in general and focused on refining our dot probe measure of attentional bias. Across all studies, we also investigated whether attentional biases, particularly in a condition where age-related threats were cued, were associated with self-reported stress among older adults.

Pilot Study

Older adulthood may bring specific concerns about cognitive decline (Werner, 2002), which has been referred to as the "illness of exclusion" (Gubrium, 1986), and has been associated with negative reactions from others (Langdon, Eagle, & Warner, 2007) and increased stress (Cutler & Hodgson, 2013). The aims of this initial study were to begin to examine the self-worth contingency approach in the context of old age, and to create our dot probe measurement tool for assessing the attentional biases of older people with *cognitive decline self-worth contingencies*. Below we describe the details relevant for our subsequent studies and include all other details in the Supplemental Materials.

Methods

Participants

We recruited 36 North American participants above the age of 60 through the online crowdsourcing site, CrowdFlower. Participants with an error rate greater than 15% on the dot probe task or who failed the attentional check question were excluded (13.89%). Two participants with a mean *total rejection bias* and mean RT on valid and invalid rejection trials above two standard deviations (SDs) from the sample means were also removed. This resulted in a final sample size of N=29 (M_{age}=64.72, SD=4.79; 37.9% male, 62.1% female).

Questionnaires

Demographics. Participants first answered demographic questions, including age, gender, occupation, and education.

Self-esteem. Participants completed Rosenberg's Self-Esteem Scale (RSES; Rosenberg, 1965). The 10-item scale assesses both positive and negative feelings and judgments about the self (e.g., *"*On the whole, I am satisfied with myself*"*). Responses were measured on a 4-point Likert scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). Positive items were reverse coded such that higher scores indicated higher levels of self-esteem.

Cognitive decline contingency items. To assess the specific contingency domain of age-related cognitive decline, participants completed items that we adapted from the original Contingencies of Self-Worth Scale (Crocker et al., 2003; e.g., "If I think that I am experiencing cognitive decline, I feel bad about myself.") Responses were measured on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Higher scores indicated greater cognitive decline self-worth contingencies.

Stress. Participants completed the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). The 10-item self-report scale assesses feelings and thoughts related to stress throughout the last month (e.g., "In the last month, how often have you felt confident about your ability to handle your personal problems?"). Responses were measured on a 5-point Likert scale, ranging from 0 (*never*) to 4 (*very often*). Negative items were reverse coded. Higher scores indicated higher stress levels in the last month.

Attentional check item. As is standard in online studies, one attentional check item was included ("Leave this question unmarked to indicate that you have read the question"). If a participant failed to leave the item blank, they were excluded from all further data analyses.

Dot probe task

After the questionnaires, participants performed a dot probe task (see Fig. 1) with 80 trials. The dot probe task was programmed in Javascript and was run in the user's browser.

Participants were asked to sit approximately 60 cm ("or 24 inches") away from their computer screen.

Each trial began with a cue word in the middle of the screen for 500 ms. Cues representing cognitive decline were *senile* and *dementia*; those representing a lack of cognitive impairment were *alert* and *aware*. Next, a pair of older adult faces – either rejecting-neutral, accepting-neutral, or neutral-neutral – was presented for 500 ms. Each face image, selected from the FACES image database (Ebner, Riediger, & Lindenberger, 2010), measured 4.5 cm x 7 cm on the screen. The images were 11.5 cm apart from their centers. They were presented in color against a dark grey background. Following the offset of the faces an arrow appeared on either the left or right; reaction times (RTs) to identify the probe were recorded. The various parameters (e.g., position of faces) were counterbalanced across each cue word. Inter-trial intervals were variable and randomly set at 500 or 1250 ms.

Results and discussion

Data preparation

Trials with errors, RTs less than 200 ms, and RTs more than two standard deviations (SDs) above the participant's mean were discarded (7.71%) (consistent with previous research; see, e.g., Dandeneau et al., 2007, Heeren, Philippot, & Koster, 2015 and Sluis & Bochen, 2014). A *total rejection bias* was calculated by subtracting the mean RT on valid rejection trials (probe replaces frowning face) from the mean RT on invalid rejection trials (probe replaces neutral face). A specific *decline-cued rejection bias* was calculated from the subset of trials with decline cues (*senile* or *dementia);* the *alert-cued rejection bias* was calculated from trials with alertness cues (*alert* or *aware*). Acceptance biases were calculated in a parallel fashion.

Decline contingency

The decline self-worth contingency correlated with the other well-being self-report measures in the expected direction in the .10 to .30 range (Table 1), although correlations were nonsignificant with the small sample size.

[Insert Table 1 near here]

Rejection bias

Self-worth contingencies were associated with attentional bias. First, we found that participants with a greater *total rejection bias* tended to report more cognitive decline self-worth contingencies, β=.54, $t(23)$=3.16, p=.004, $r_{partial}$=.55 (controlling for demographics). Next, we examined the link between the specific cued biases and decline self-worth contingencies (controlling for demographics): The *decline-cued rejection bias* was a significant predictor, β=.45, $t(22)$=2.47, p=.022, $r_{partial}$=.47, whereas the *alert-cued rejection bias* was only marginally significant, β=.31, $t(22)$=1.81, p=.084, $r_{partial}$=.36. When examining stress, none of the analyses (either with total or cued biases) showed any effect of attentional bias on stress.

Summary

Our pilot study provided some initial support for our hypothesis that aging-related insecurity is associated with lower well-being and attentional biases toward rejection, particularly when reminded of a cognitive decline threat. Unexpectedly, the *alert-cued rejection bias* was also marginally associated with the decline contingency, suggesting that the link between decline contingency and attentional bias may be a general one rather than only occurring in the context of decline threats. Moreover, we did not find support for the hypothesis that attentional biases would be associated with greater stress: This may simply be a result of our limited sample size, or it may be that the issue of cognitive decline is not sufficiently broad to tap into people's aging concerns.

Study 1

In Study 1, we sought to conduct a more rigorous test of our aging-insecurity hypothesis and to address several limitations of our previous study. First, cognitive decline is likely just one aspect of aging related to self-esteem and social stress; here we sought to assess a broader contingency domain, reflective of a more general insecurity about getting older. Second, we recruited a larger sample, given that our previously small sample may have limited our ability to detect findings with the self-reported measures of well-being. Third, as a result of the lack of significant findings with the acceptance biases (see Supplemental Materials), we modified the dot probe procedure by removing acceptance trials and instead pitting frowns vs. smiles within each trial. Plus we included uncued trials for a more pure index of a general rejection bias. Finally, we included both old and young faces in the dot probe task to explore which rejecting targets participants' would be most likely to orient their attention toward.

Methods

Participants

We recruited 229 older adults through the online crowdsourcing site, Amazon's Mechanical Turk. Applying the same exclusion criteria as our pilot study resulted in a final sample of N=198 (M_{age}=65.45, SD=5.64; 36.4% male, 63.6% female).

Questionnaires

Upon completing demographic questions, the following questionnaires from Study 1 were administered: decline contingency, RSES (Rosenberg, 1965), PSS (Cohen et al., 1983), and an attentional check item. The additional questionnaires below were also included.

Aging contingency items. To assess the broader contingency domain of aging in general, participants completed a new set of items that we adapted from the CSWS (Crocker et al., 2003). The 4-item scale was designed to measure how much one's self-worth was felt to be dependent on one's age and how much one's self-esteem would suffer when feeling old. Responses were

measured on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The following items were used: (1) "I can't respect myself if I feel like I am old", (2) "When I feel young, my sense of self-worth increases", (3) "My sense of self-worth is not influenced by how old I feel" (reverse scored), and (4) "When I feel like I am young, I feel good about myself". Higher scores indicated higher contingencies of self-esteem based on age. The internal consistency (Cronbach's alpha) was .750 for these 4 items.

Ageism. The 23-item Fraboni Scale of Ageism (FSA; Fraboni, Saltstone, & Hughes, 1990) was used to assess stereotypical attitudes towards old people. In the case of an elderly population, this scale assesses self-stereotypical attitudes relating to old age. Items were scored on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Negative items were reverse coded, such that higher scores indicated self-stereotypical ageist attitudes.

Self-reported worries about aging. We created a brief measure based on the literature suggesting that old age is associated with various concerns and worries. The scale assesses the extent to which a participant feels they are worried about a particular issue they may experience with their older age, including loss of financial self-sufficiency, reduced mobility, declining physical health, loss of supportive relationships, being alone, memory loss, and declining cognitive abilities. Items were scored on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). An average score across all concerns was created, with higher scores indicating greater concerns and worries.

Dot probe task

The procedure for the dot probe task followed that from our pilot study with minor modifications. First, there were three types of cues: Cues were *old* and *young*, and + in the uncued condition which was intended to more directly assess a general bias. Second, due to the lack of findings with the acceptance-neutral trials in the pilot study, we paired the rejecting faces

with accepting faces in each trial (i.e., no neutral faces). This yielded 32 trials per cue condition (96 trials overall). Finally, we included both older and younger adult face pairings (half of the trials in each condition were with older faces and the other half of trials with young faces; i.e., 16 trials per cue condition for each face type).

Results and discussion

Aging contingency

The aging self-worth contingency was found to be significantly and moderately correlated with all the self-reported measures of well-being in older adulthood (see Table 2). Moreover, we found that the decline contingency was not only associated with self-reported measures of well-being, but also significantly correlated with the broader aging contingency, suggesting that older adults who base their self-worth on youthfulness also tend to base their self-worth on being cognitively aware. Given this finding and our results in the pilot study, we control for the decline contingency in subsequent analyses to ensure that our current results are indeed attributable to the broader aging contingency.

[Insert Table 2 near here]

Total rejection bias

Contrary to our findings in the pilot study, we did not find support for an association between the aging contingency and participants' overall rejection bias across all trials, $r(196)=.01$, $p=.911$. This finding was unchanged when controlling for the decline contingency, $\beta=.04$, $t(195)=.62$, $p=.540$, $r_{partial}=.04$. To control for the previously documented influence of demographic factors on self-esteem-related variables (McMullin & Cairney, 2004), we ran a regression also controlling for age, gender, and education: The findings remained unchanged, $\beta=.04$, $t(192)=.57$, $p=.570$, $r_{partial}=.04$. Moreover, self-esteem was uncorrelated with the *total rejection bias,* $r(196)=.02$, $p=.769$, and controlling for self-esteem did not change the non-

significant relationship between the *total rejection bias* and the aging contingency. In this study with multiple stimulus configurations, then, calculating an overall bias score by collapsing across cue words and face stimuli did not reveal a general cognitive bias that was associated with contingent self-esteem.

Cued rejection biases

Next, we ran a regression analysis predicting the aging contingency from the 6 specific cued biases (i.e., separated based on old vs. young face, and uncued vs. old vs. young cues). Results showed that the *old-cued rejection bias* was a significant predictor of the aging contingency, when calculated from trials with old faces, β=.19, $t(191)$=2.60, p=.010, $r_{partial}$=.19 (whereas the *old-cued rejection bias* on young face trials was not significant, β=.01, $t(191)$=.13, p=.895, $r_{partial}$=.01). None of the other cued biases emerged as significant predictors of the aging contingency (all p's>.100). Importantly, when controlling for the decline contingency and demographic factors, the *old-cued old-face rejection bias* remained the only significant predictor of the aging contingency, β=.16, $t(187)$=2.27, p=.024, $r_{partial}$=.16. Controlling for self-esteem also left these findings unaltered. This suggests that older adults show an attentional bias toward rejection specifically when cued with *old* in the context of old faces.

Stress

Importantly, Table 2 demonstrates that stress was significantly associated with other explicit measures of well-being in older adulthood; so we conducted exploratory analyses into whether automatic attentional biases were predictors of stress above and beyond these explicit factors. Contrary to our predictions, neither the *total rejection bias* nor the specific cued biases were significant predictors of stress.

Summary

In this larger sample of older adults, we found that broader aging contingencies were significantly linked with lower well-being, including greater self-reported stress. In terms of self-reported experience, then, aging contingencies showed the predicted association with negative outcomes. At the social cognitive level, although we failed to find evidence for a correlation with general rejection bias, we did find that older adults with aging contingencies held an attentional bias toward rejection when reminded of being old, particularly in the context of older target stimuli. Indeed, social rejection from in-group members compared to out-group members – in this case, from other older adults rather than their younger counterparts – has been found to be particularly distressing (Krill & Platek, 2009). Apart from the shared social category, friends in older adulthood, who tend to be of similar age (Field & Minkler, 1988), represent an important source of social support (Nocon & Pearson, 2000). As such, rejection from one's peers in older adulthood may be especially relevant and, thus, important to focus attention toward. Similar to the pilot study, we did not find an association between negative attentional biases and stress. However, we speculate that the limited number of trials with old faces may have limited our ability to detect findings with the *total rejection bias* and stress. In other words, it remains possible that the inclusion of young faces, along with three different cueing conditions, in a limited number of total trials may have undermined our ability to observe associations between attentional bias scores and stress.

Study 2

Given that attentional biases were evident only in the context of older targets, in our final study we modified the procedure of the dot probe task to include only older adult targets to attempt to replicate our findings with the *old-cued rejection bias*. Moreover, we predicted that using only old faces in the current study would allow us to better assess our hypothesized effects with general rejection bias and stress.

Methods

Participants

We recruited 97 participants over 60 years of age through CrowdFlower. The same criteria for excluding participants as the previous two studies was used resulting in a final sample of N=78 (M_{age}=63.65, SD=4.09; 51.3% male, 48.7% female).

Questionnaires

The same demographic and self-report questionnaires from Study 1 were administered in the present study.

Dot probe task

The procedure for the dot probe task followed that from Study 1 (i.e., three within-subject conditions with trials cued by *old*, *young,* or +) except that only old faces were used (i.e., no young faces) in all 96 trials.

Results and discussion

Data preparation

The same criteria as in the two previous studies for excluding dot probe trials (9.50%) were used.

Aging contingency

Consistent with the previous study, the aging contingency of self-worth and the decline contingency were significantly and moderately correlated with self-report measures of well-being, including stress (Table 3).

[Insert Table 3 near here]

Total rejection bias

A greater *total rejection bias* was significantly correlated with having higher aging contingency, $r(76)=.23$, $p=.047$. To ensure that this relationship was independent of the decline

contingency, a regression controlling for this latter measure revealed that the *total rejection bias* remained a significant predictor, β=.24, t(75)=.2.49, p=.015, $r_{partial}$=.28. When adding demographics as controls, the *total rejection bias* remained a predictor of the aging contingency, β=.22, t(71)=2.25, p=.027, $r_{partial}$=.26. Moreover, self-esteem was not associated with the *total rejection bias,* r(76)=-.08, p=.504, and these findings held when also controlling for self-esteem. This suggest that people with aging insecurities hold a general rejection bias, and that this effect is not simply due to a person's general level of self-esteem.

Cued rejection biases

Next, we ran a regression predicting the aging contingency from the three bias conditions, that is, trials cued by *old*, trials cued by *young*, and uncued trials (controlling for demographics and the decline contingency). The *old-cued rejection bias* was marginally significant, β=.20, t(69)=1.82, p=.074, $r_{partial}$=.21, the *young-cued rejection bias* was not significant, β=.07, t(69)=.67, p=.506, $r_{partial}$=.08, however the *uncued rejection bias* was significant, β=.20, t(69)=2.01, p=.048, $r_{partial}$=.24. When controlling for self-esteem, findings remained the same except that the *uncued rejection bias* became only marginally significant.

Stress

As in study 1 we conducted exploratory analyses to examine whether attentional biases could predict self-reported stress over and above explicit measures of age-related concerns. First, we ran a regression analysis predicting stress from the *total rejection bias*, self-esteem, ageism, and our measure of concerns and worries (controlling for demographics). Self-esteem, β=-.40, t(69)=-3.90, p<.001, $r_{partial}$=-.43, and concerns and worries, β=.24, t(69)=2.42, p=.018, $r_{partial}$=.28, were significant predictors of stress; Ageism, β=.14, t(69)=1.31, p=.193, $r_{partial}$=.16, was not found to be a predictor of stress. More importantly, the *total rejection bias* was a

significant predictor of stress over and above the self-reported measures, β=.20, t(69)=2.09, p=.040, $r_{partial}$=.24.

Next, we ran the same regression but separating the rejection bias according to the three within-subject cue conditions. Here we found support for our hypothesis regarding the influence of cued attentional bias on stress: The *old-cued rejection bias* was a significant predictor of stress, β=.23, t(67)=2.08, p=.041, $r_{partial}$=.25. However, the *young-cued rejection bias*, β=.18, t(67)=1.55, p=.125, $r_{partial}$=.19, and the *uncued rejection bias*, β=.06, t(67)=.62, p=.540, $r_{partial}$=.08, were not significant independent predictors of stress.

Summary

Consistent with the previous studies, we found support for the hypothesis that age-related contingencies were associated with lower self-reported well-being measures. With our measure of cued attentional bias, we also found that older adults with aging contingencies had a general attentional bias toward rejection and observed some evidence that aging contingencies were associated with a specific cued bias when reminded of being old, although this finding was only marginally significant. Finally, we showed that this negative attentional bias, primarily when cued with the word *old*, was significantly linked to greater self-perceived stress in old age.

General Discussion

Our findings documented that having age-related contingencies of self-worth was associated with a number of negative well-being outcomes, including lower self-esteem, more concerns and worries, and higher self-reported perceived stress. In addition, although the results were not identical across studies, we found support for the hypothesis that older adults with aging contingencies of self-worth would hold a negativity, rather than positivity, bias in social information processing. First, we showed that a general attentional bias toward rejection was related to insecurity about aging. Second, we found some evidence of a specific negative

attentional bias under conditions of age-related threats, such that older adults with aging or cognitive decline contingencies were likely to orient toward rejection particularly when reminded of their aging insecurity. Moreover, this selective attention pattern was present exclusively in the context of older target faces, suggesting that older adults are more attentive to rejection from their peers than their younger counterparts. Finally, in Study 2, we found that the measure of attentional bias – particularly when cued by a reminder of aging – was associated with greater stress. Collectively our findings show that it is possible to identify a subset of older adults, that is, those who have internalized negative societal views on aging, who will have lower personal well-being and a heightened tendency to focus attention on rejection, especially when confronted with their aging concerns.

It is important to contextualize these findings within a sizeable literature examining well-being and implicit social cognition that has actually provided evidence for a *positivity effect* in older adults, such that information processing biases have been found toward a range of positive stimuli (Allard, Wadlinger, Isaacowitz, 2010; Carstensen et al., 2000; Kennedy, Mather & Carstensen, 2004). Initial evidence for this phenomenon was a between-subjects effect, in that older adults, compared to younger adults, showed a greater bias toward positivity (Mather & Carstensen, 2005). However, a subsequent meta-analysis also demonstrated a significant positivity bias within-person, albeit small in effect size, suggesting that older adults in general do preferentially process positive, in contrast to negative, information (Reed et al., 2014). The current findings do not contradict this body of work: Our findings should not be taken as implying that all older adults will have lower well-being and hold negative attentional biases. Rather, our research indicates that those older adults who are insecure about aging are likely to be at risk for experiencing stress and negative social information processing biases.

Older adulthood can raise various concerns about, for example, independence, health, and finances, as well as concerns about social rejection, isolation, and stigma about aging. Although many individuals may be resilient and carefree in old age, others may come to internalize the idea that they will be rejected by others on the basis of their age. Not only can this insecurity foster lower well-being, but may also involve a negative attentional bias that can play a role in perpetuating the insecurity. Indeed, insecurity about some aspect of oneself can involve a self-sustaining pattern of social information processing, as one becomes preoccupied with insecurity-relevant information (Williams, Mathews, & MacLeod, 1996) and the impact it may have on social relations. By examining the precise conditions under which an age-contingent person orients towards social rejection – in particular, when cued with their insecurity concerns – we might better understand the social cognitive processes maintaining insecurity.

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Tables

Table 1

Bivariate correlations between the cognitive decline contingency and self-report measures in the pilot study.

	Decline Contingency	Self-Esteem	Anxiety	Stress
Decline Contingency	-	-	-	-
Self-Esteem	-.29	-	-	-
Anxiety	.29	-.65**	-	-
Stress	.10	-.49**	.77**	-

Note: ** $p < .01$

Table 2

Bivariate correlations between the aging contingency and self-report measures in Study 1.

	Aging Contingency	Decline Contingency	Self-Esteem	Concerns	Ageism	Stress
Aging Contingency	-	-	-	-	-	-
Decline Contingency	.34***	-	-	-	-	-
Self-Esteem	-.25***	-.20**	-	-	-	-
Concerns	.24**	.45***	-.29***	-	-	-
Ageism	.34***	.05	-.13†	.03	-	-
Stress	.29***	.28***	-.46***	.61***	.09	-

Note: † $p<.100$, * $p<.05$, ** $p<.01$, *** $p<.001$

Table 3

Bivariate correlations between the aging contingency and self-report measures in Study 2.

	Aging Contingency	Decline Contingency	Self-Esteem	Concerns	Ageism	Stress
Aging Contingency	-	-	-	-	-	-
Decline Contingency	.51**	-	-	-	-	-
Self-Esteem	-.30**	-.29**	-	-	-	-
Concerns	.44**	.36**	-.25*	-	-	-
Ageism	.38**	.19†	-.31**	.18	-	-
Stress	.31**	.24*	-.52**	.35**	.31**	-

Note: † $p<.100$, * $p<.05$, ** $p<.01$,

Figures

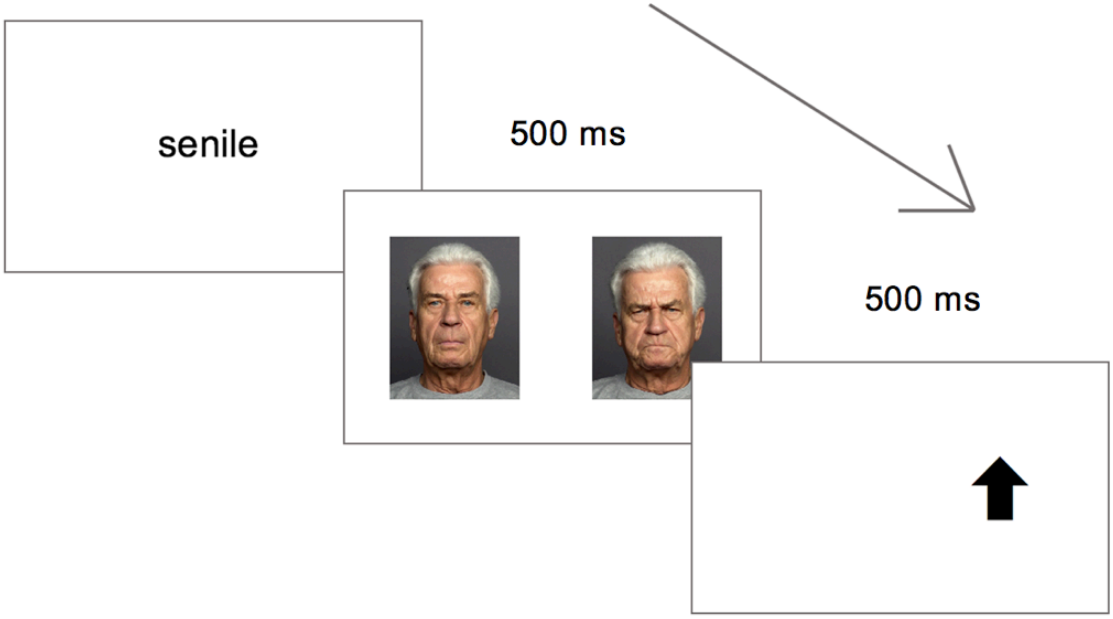

Fig. 1. Example of the dot probe task with cue words used in the pilot study. A faster reaction time on this particular type of trial (i.e., when the probe replaces the rejecting face on a trial cued with *senile*), would reflect a greater *decline-cued rejection bias*. Photos courtesy of Ebner, Riediger, and Lindenberger (2010).