Younger and Older Adults' Mood and Expectations Regarding Aging During COVID-19

Mary C. Whatley, MA, Alexander L. M. Siegel, PhD, Shawn T. Schwartz, BS,

Katie M. Silaj, BA, & Alan D. Castel, PhD

Department of Psychology, University of California, Los Angeles

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Author Note

Mary C. Whatley ⓘ https://orcid.org/0000-0003-3609-5630

Alexander L. M. Siegel ⓘ https://orcid.org/0000-0001-5199-4461

Shawn T. Schwartz ⓘ https://orcid.org/0000-0001-6444-8451

Katie M. Silaj ⓘ https://orcid.org/0000-0002-5561-9017

Alan D. Castel ⓘ https://orcid.org/0000-0003-1965-8227

Please address all correspondence to Mary C. Whatley, Department of Psychology,

Psychology Building 1285, University of California, Los Angeles, 502 Portola Plaza, Los

Angeles, CA 90095, mcwhatley@ucla.edu.

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Abstract

The 2019 novel coronavirus disease (COVID-19) has broadly impacted our daily lives. Here, we used a longitudinal approach to investigate older adults' mood and expectations regarding aging before and during the global pandemic (Study 1). We also examined age differences in mood, expectations regarding aging, COVID-19 attitudes, and loneliness using a cross-sectional approach (Study 2). In Study 1, older adults completed a mood and expectations regarding aging survey up to two years prior to the pandemic and again in April, 2020 (during the pandemic). Participants also completed surveys regarding COVID-19 attitudes and loneliness. In Study 2, a United States sample of younger and older adults completed these surveys during the pandemic. Older adults' mood and expectations regarding aging remained fairly constant, and younger adults showed lower mood and expectations regarding aging than did older adults, despite older adults showing greater concern about COVID-19. Overall, we find that some older adults seem to be resilient with respect to their mood and expectations regarding aging. This study reveals important preliminary implications for how older adults may be impacted as a result of lifestyle changes necessary for their well-being and the well-being of society.

Keywords: COVID-19, Expectations Regarding Aging, Loneliness, Mood

Younger and Older Adults' Mood and Expectations Regarding Aging During COVID-19

When the World Health Organization declared the 2019 novel coronavirus disease (COVID-19) a pandemic in March 2020, people were urged to "social distance" by limiting their activity in public spaces, refraining from in-person visits with family and friends, and maintaining a distance of six feet from others when engaging in essential activities. As a consequence, many older adults who had active social lives likely experienced major changes in their routines, leading them to feel isolated, lonely, or have decreased mood. Further, almost one third of older adults live alone (Administration on Aging, 2018), many already experience loneliness (Gerst-Emerson & Jayawardhana, 2015), and increased loneliness may lead to a multitude of negative mental and physical health outcomes in both younger adults (Jaremka et al., 2014) and older adults (Ong et al., 2016). Some work has investigated older adults' worries about COVID-19 (Barber & Kim, 2020), but it is unclear whether COVID-19 has influenced older adults' overall mood.

COVID-19 can be dangerous for people of any age, but mortality rates are higher for those aged 65 and older (CDC, 2020; Hauser et al., 2020). At the onset of the pandemic, older adults (aged 65+) made up 43.4% of COVID-19-related hospitalizations, and the rate of hospitalization for this group was almost double that of those aged 50-64 years, which was three times higher than for 18-49 year-olds, demonstrating the striking increase in COVID-19-related health risks with increasing age (Garg, 2020). Widespread media focus on the impact of COVID-19 on older adults as a fragile population could also lead older adults to feel more vulnerable and affect attitudes about aging (Ayalon et al., 2020). Some work has shown that older adults' physical and mental health can be influenced by societal attitudes about aging (Chang et al., 2020). Swift et al. (2017) describe the Risks of Ageism Model (RAM), which posits that societal ageism (e.g., economic, social, and psychological factors) contributes to both negative self-

perceptions of age stereotypes and an increased likelihood of being a target of ageism in older adults. These experiences, in turn, serve as barriers to experiencing independence, autonomy, and higher quality of life. Thus, a widespread focus on the fragility of older populations during the pandemic could have negative effects on older adults' attitudes or expectations about aging. Unfortunately, negative attitudes about aging are related to a variety of health outcomes, including lower survival rates and physical and mental health issues (Breda & Watts, 2017; Han & Richardson, 2014). Anxiety about aging can even explain some of the relationship between one's environment and loneliness (Ayalon, 2018), suggesting that negative aging attitudes could exacerbate feelings of loneliness (see also Shiovitz-Ezra et al., 2018). On the other hand, positive attitudes about aging have been associated with more new friends in older adulthood (Menkin et al., 2017), which could prevent loneliness.

Given the increased risk of hospitalization or death due to COVID-19, older adults may take greater preventive measures and hold more serious attitudes toward COVID-19 than younger adults. It is unclear, however, how attitudes about COVID-19 relate to outcomes like mood or attitudes about aging, or whether this relationship is different between younger and older adults. Those with more serious attitudes about COVID-19 may experience greater loneliness or decreased mood if they are isolating to a greater extent, but people may also feel safer and thus more positive if they are taking the recommended precautions. In the current studies, we examined mood, expectations regarding aging, coronavirus attitudes, and loneliness in younger and older adults.

Study 1

In the first study, we examined mood and expectations regarding aging before and during the coronavirus pandemic. A sample of older adults who provided responses to surveys from

January 2018 to December 2019 completed follow-up surveys during the course of the

pandemic, and response differences were analyzed.

Method

   Participants. Eighty-six older adults who completed the Expectations Regarding Aging

(ERA) and Brief Mood Introspection Scale (BMIS) between January 2018 and December 2019

(Time 1) were contacted to participate. Forty-nine participants (M_{age} = 73.90 years, SD_{age} = 7.50

years) provided responses between April 7 and May 2, 2020 (Time 2). Two participants did not

respond to the BMIS at Time 1 but did respond to all surveys at Time 2. All participants reported

residing in the United States at the time of data collection, and all other demographic information

is presented in Table 1. Of those who did not respond at Time 2, 17 never responded to outreach,

12 were contacted and interested but did not participate before the deadline, 3 were unreachable,

and 5 were reached but were not interested. To examine whether those who responded were

demographically different from those who did not, we conducted Chi-Square tests for

independence and found that older adults who participated at Time 2 and those who did not

showed no significantly different makeup of gender, χ^2 (1, N = 86) = 0.16, p = .69, ethnicity, χ^2

(2, N = 86) = 1.17, p = .34, race, χ^2 (4, N = 86) = 4.93, p = .29, nor education, χ^2 (3, N = 86) =

4.41, p = .22. There was also no difference in age, t(84) = 1.08, p = .29, nor in self-reported

health, t(84) = 0.24, p = .81, between participants who responded at Time 2 and those who did

not.

   Materials and Procedures. This study used a longitudinal approach to examine

differences in outcomes across two time points. Participants were contacted by email, but given

the option of completing the surveys over the phone if they were uncomfortable with computers

or if it was easier for them. Most (n = 41) chose to complete the surveys online. All procedures

were approved by the University of California, Los Angeles Institutional Review Board, and

informed consent was obtained. After self-reporting health on a 1 (*poor*) to 10 (*excellent*) scale,

participants completed the BMIS (Mayer & Gaschke, 1988), which contains 16 adjectives rated

on a 1 (*definitely do not feel*) to 7 (*definitely feel*) Likert scale, as well as an overall mood item

rated from -10 (*very unpleasant*) to 10 (*very pleasant*). The BMIS assesses four constructs

related to participants' mood. First, the pleasant-unpleasant scale, which includes responses from

all items, indicates a participant's overall mood valence, with higher scores indicating more

pleasant mood. The arousal-calm subscale provides a measure of how aroused (i.e., jittery,

excited, nervous) participants are, independent of the valence of those emotions, with lower

scores indicating less aroused or more calm mood. The positive-tired subscale assesses positive

mood, with lower scores indicating less positive or more tired mood, and the negative-relaxed

subscale measures negative mood, with lower scores indicating less negative or more calm

mood.

Participants also completed the 12-item ERA scale (Sarkisian et al., 2005), which

measures attitudes about aging. Participants rated statements about older age that apply both

personally (e.g., "I expect that as I get older, I will become more forgetful.") and more broadly

(e.g., "Having more aches and pains is an accepted part of aging."). The ERA is composed of

three subscales: Cognitive Function, Physical Health, and Mental Health, all rated from 1

(*definitely true*) to 4 (*definitely false*), and then converted to a 0-100 scale. Lower scores indicate

expectations of decline in older age, while higher scores represent higher expectations, including

expecting achievement and high functioning in older age.

Participants then completed the Attitudes and Prevention subscales of a new COVID-19

Pandemic scale (Priniski, preregistration), which measures participants' attitudes and opinions

about the impact of COVID-19. The scale was created using a scale measuring vaccine

skepticism and beliefs about diseases like measles and mumps (Powell et al., 2018). After

reading a brief definition of COVID-19, participants provided responses on a Likert scale from 1

(*strongly disagree*) to 7 (*strongly agree*) to a series of statements such as "COVID-19,

commonly referred to as coronavirus, is no more severe than the flu." Lower scores indicate

more serious attitudes and prevention intentions. After responding to a few open-ended questions

about their behavior during the pandemic, participants then completed a 3-item version of the

UCLA Loneliness Scale (Hughs et al., 2004). The items (e.g., "How often do you feel that you

lack companionship?") were rated on a scale of 1 (*hardly ever*) to 3 (*often*), with higher scores

indicating greater feelings of loneliness.

Results

      Expectations Regarding Aging. We conducted dependent-samples *t*-tests on each of the

ERA subscales and on the total ERA score. All means and standard deviations are reported in

Table 2. There were no significant differences between Time 1 and Time 2 scores on the

Physical Health, $t(48) = 0.65$, $p = .52$, $d = 0.09$, Mental Health, $t(48) = 1.42$, $p = .16$, $d = 0.20$, or

Cognitive Function subscales, $t(48) = 0.16$, $p = .87$, $d = 0.02$. There was also no change in total

ERA score from Time 1 to Time 2, $t(48) = 0.11$, $p = .91$, $d = 0.02$.

      To determine the validity of the null effects between time points, we calculated a Bayes

Factor for each test, which gives a measure of the strength of the evidence for the null or

alternative hypotheses based on *a priori* hypotheses and the data (see Kruschke, 2013;

Wagenmakers et al., 2017 for discussions of the benefits of using Bayes factors). As interpreted

by guidelines in Lee and Wagenmakers (2013), the Bayesian paired-samples *t*-tests using default

Cauchy priors indicated "moderate" evidence in favor of the null hypothesis (i.e., no difference

between Time 1 and 2) on the Physical Health ($BF_{01} = 5.26$), Cognitive Function ($BF_{01} = 6.36$),

and total ERA ($BF_{01} = 6.40$) scores, but only "anecdotal" evidence on the Mental Health score

($BF_{01} = 2.53$). These values indicate that the data for the Physical Health measure were 5.26

times more likely to occur under the null relative to the alternative model, the data for Cognitive

Health were 6.36 more likely under the null model, and so on. Thus, the results provide moderate

evidence of consistent ERA physical, cognitive, and total scores between Time 1 and 2, with

inconclusive evidence on mental health scores. In subsequent analyses, we report Bayes Factors

for null effects.

Mood. We scored the BMIS according to Mayer (2018) to obtain subscale scores on the

following dimensions: pleasant-unpleasant (ranging from 16-112), arousal-calm (ranging from

12-84), positive-tired (ranging from 7-49), and negative-relaxed (ranging from 6-42). There were

no differences between overall mood ratings at Time 1 and Time 2, $t(46) = 0.23$, $p = .82$, $d = 0.03$, $BF_{01} = 6.16$, nor overall pleasant-unpleasant ratings, $t(46) = 1.77$, $p = .08$, $d = 0.26$, $BF_{01} = 1.50$. In addition, there were no significant differences in the positive-tired subscale at Time 1

and Time 2, $t(46) = 0.71$, $p = .48$, $d = 0.10$, $BF_{01} = 4.97$. However, scores on the arousal-calm

subscale were significantly higher at Time 2 than Time 1, $t(46) = 3.06$, $p = .004$, $d = 0.45$, as

were scores on the negative-relaxed subscale, $t(46) = 3.35$, $p = .002$, $d = 0.49$. The Bayes Factors

for the null effects here support moderate evidence for the lack of change in positive mood, but

only anecdotal evidence for the lack of change in pleasant mood. Thus, while mood did not

become less positive, participants were more aroused and had more negative (less calm) mood at

Time 2 than at Time 1.

Correlations Between Expectations, Mood, and COVID-19. The means for the

COVID-19 and loneliness scales are displayed in Table 2. Relevant Pearson's correlations are

discussed here, and all correlations between measures at Time 2 are shown in Figure 1. In all

analyses, correlation matrices were computed in R (Version 4.0.1, R Core Team, 2020) using the

stats (Version 4.0.1, R Core Team, 2020) package, and *p*-values were computed using the

"cor_pmat" function in the *ggcorrplot* (Version 0.1.3, Kassambara, 2019) package; correlation

matrix figures were generated using the *corrplot* (Version 0.84, Wei & Simko, 2017) package

with *RColorBrewer* (Version 1.1-2, Neuwirth, 2014). The correlations revealed that those with

higher expectations about aging had more pleasant mood, $r(47) = 0.50$, $p < .001$. In addition,

higher loneliness scores were associated with significantly lower ERA scores, $r(47) = -.33$, $p =$

.02, and BMIS scores, $r(47) = -.43$, $p = .003$. Higher health ratings were associated with higher

ERA scores, $r(47) = .37$, $p = .01$, and BMIS scores, $r(47) = .36$, $p = .01$. Lastly, COVID-19

scores were not associated with health, $r(47) = .02$, $p = .89$, ERA scores, $r(47) = .08$, $p = .58$, or

BMIS scores, $r(47) = .18$, $p = .24$, but were associated with loneliness scores, $r(47) = -.30$, $p =$

.04, such that taking COVID-19 more seriously was associated with greater loneliness.

Discussion

In Study 1, we found that overall, our sample of older adults was maintaining positive

mood and expectations about aging during the COVID-19 pandemic, but that they reported more

negative arousal. In addition, loneliness was negatively related to both attitudes about aging and

mood pleasantness. Thus, while older adults do not seem to be entirely unaffected by the

COVID-19 pandemic, this sample of older adults seemed to maintain positive mood and attitudes

about aging overall.

Study 2

In Study 2, we attempted to replicate findings from Study 1 regarding loneliness,

COVID-19 attitudes, mood, and expectations regarding aging in a larger sample of older adults.

We also examined age-related differences in mood, expectations about aging, loneliness, and

attitudes toward COVID-19 in a national sample of older and younger adults.

Method

   Participants. The participants in Study 2 were younger and older adults recruited using

Prime Panels on CloudResearch (formerly known as TurkPrime; www.cloudresearch.com).

Similar to other online data collection platforms like Amazon Mechanical Turk (MTurk),

CloudResearch's Prime Panels allows for researchers to target and collect large, diverse samples

of participants. Prime Panels participants have been shown to produce similar rates of passing

attention checks and similar effect sizes as other online and in-lab samples, while being more

representative of the U.S. population (Chandler et al., 2019). Prime Panels also has a larger

proportion of older adults, with over 23% of participants over the age of 60 relative to 3.3% of

MTurk participants meeting the same criterion (Chandler et al., 2019; Huff & Tingley, 2015). As

such, despite obvious limitations inherent to online data collection, Prime Panels is a useful tool

to efficiently obtain quality older adult data.

   Participants were restricted to be ages 18-30 or 60+ and to reside in the United States.

The older adult age range was restricted so as to match that of Study 1, and the younger adult

range is consistent with recent similar research (e.g., Barber & Kim, 2020). To ensure

participants were paying attention, we used a measure of participants' focus (i.e., the proportion

of time in which a participant's computer mouse was present on the browser page), and

participants were excluded from the experiment if they had less than 0.75 (out of 1.00) focus for

the duration of the survey. Participants were also excluded if they selected the incorrect response

on an attention check question. The survey was completed in median time of 9.59 minutes (*IQR*

= 6.46–13.25 minutes). The final sample consisted of 115 younger adults (M_{age} = 25.15 years,

SD_{age} = 3.63 years) and 115 older adults (M_{age} = 69.70 years, SD_{age} = 6.16 years) who were compensated $2.00 for their participation which lasted on average 15 min. Other relevant demographic information is presented in Table 1.

Materials and Procedure. The same materials used in Study 1 were also used in Study 2. Participants completed a demographics form and the ERA, BMIS, COVID-19 Pandemic, and loneliness surveys. This study used a cross-sectional design to examine age differences in outcomes.

Results

Expectations Regarding Aging. We conducted independent samples t-tests on each of the ERA subscales and the total ERA score[1]. Means for all measures are shown in Table 2. Older adults had higher scores on the Physical Health, $t(228) = 3.29$, $p = .001$, $d = .43$, Mental Health, $t(219.2) = 7.31$, $p < .001$, $d = .96$, and Cognitive Function, $t(228) = 4.73$, $p < .001$, $d = .62$ subscales than did younger adults. Additionally, older adults provided higher total ERA ratings than did younger adults, $t(221.6) = 6.15$, $p < .001$, $d = .81$.

Mood. On average, there was no difference between older and younger adults' overall mood, $t(228) = 1.25$, $p = .21$, $d = .17$, $BF_{01} = 3.40$. However, older adults scored significantly higher than younger adults on the pleasant-unpleasant scale, $t(228) = 6.05$, $p < .001$, $d = .80$, and on the positive-tired subscale, $t(228) = 4.72$, $p < .001$, $d = 0.62$. Conversely, younger adults scored significantly higher than older adults on the arousal-calm subscale, $t(228) = 2.76$, $p = .01$, $d = .36$, and on the negative-relaxed subscale, $t(222.3) = 6.14$, $p < .001$, $d = .81$. Younger adults were also significantly lonelier than older adults, $t(228) = 3.37$, $p < .001$, $d = .44$. Overall,

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[1] In these and all following similar analyses, when equal variance assumptions were violated, Welch's unequal variances t-tests were used.

younger adults had less positive and more negative mood and reported experiencing greater

arousal than older adults.

COVID-19 Pandemic Behaviors, Attitudes, and Opinions. We calculated attitude and

prevention subscale scores for the COVID-19 survey. Older adults had more positive attitudes

about the COVID-19 pandemic than younger adults, $t(210) = 7.88$, $p < .001$, $d = 1.04$. Older

adults also reported more concern about COVID-19 prevention than younger adults, $t(195) =$

6.58, $p < .001$, $d = 0.87$. Overall scores on the COVID-19 scale were higher in younger adults

than in older adults, $t(202) = 8.06$, $p < .001$, $d = 1.06$. Thus, older adults reported taking the

COVID-19 pandemic more seriously and engaging in preventative behaviors to a greater extent

than younger adults.

Correlations Between Expectations, Mood, and COVID-19. Pearson's correlations

were conducted within each age group to examine associations between overall ERA score,

BMIS pleasant-unpleasant mood, COVID-19 score, loneliness rating, and relevant demographic

factors like age, gender, education, income, and overall health. Significant correlations of interest

are discussed here (with additional correlations presented in Figure 1). For older adults, higher

ERA scores were associated with more pleasant mood, $r(113) = .40$, $p < .001$, lower loneliness

ratings, $r(113) = -.25$, $p = .006$, higher health ratings, $r(113) = .34$, $p < .001$, and gender, $r(113) =$

.22, $p = .02$. In addition, greater loneliness was associated with more unpleasant mood, $r(113) = -$

.48, $p < .001$, lower health ratings, $r(113) = -.20$, $p = .03$, lower income, $r(113) = -.21$, $p = .03$,

and being female, $r(113) = .29$, $p = .002$. More pleasant mood was also associated with better

health, $r(113) = .37$, $p < .001$, and higher income, $r(113) = .25$, $p = .01$. Lastly, COVID-19 scores

were not significantly correlated with ERA, $r(113) = -.02$, $p = .87$, BMIS, $r(113) = .03$, $p = .78$,

loneliness, $r(113) = -.17$, $p = .07$, nor health, $r(113) = .06$, $p = .50$, but were correlated with

gender, $r(113) = -.34$, $p < .001$, such that females expressed more serious attitudes and prevention toward COVID-19 than males.

In younger adults, lower expectations regarding aging were associated with more unpleasant mood, $r(113) = .27$, $p = .004$, higher loneliness, $r(113) = -.20$, $p = .03$, higher age, $r(113) = -.25$, $p = .01$, higher income, $r(113) = -.19$, $p = .04$, higher education, $r(113) = -.30$, $p = .001$, and being male, $r(113) = .28$, $p = .002$. More unpleasant mood was associated with less COVID-19 concern and prevention intent, $r(113) = -.21$, $p = .02$, higher loneliness, $r(113) = -.43$, $p < .001$, and lower health ratings, $r(113) = .26$, $p = .01$. Similar to older adults, female younger adults reported higher COVID-19 concern, $r(113) = -.31$, $p < .001$.

Discussion

In Study 2, we found that older adults reported more positive mood and higher expectations about aging than younger adults did, supporting the finding that older adults, in general, were maintaining positivity following the onset of the COVID-19 pandemic. We also replicated in both younger and older adults the finding that more frequent feelings of loneliness were related to lower expectations regarding aging and more unpleasant mood. In addition, females were taking COVID-19 more seriously, reported higher expectations regarding aging, and were in better health, but female older adults were lonelier than males. Lastly, older adults expressed greater concern for COVID-19 than younger adults did, suggesting that they are taking it more seriously.

General Discussion

The current findings suggest older adults are, in general, maintaining their expectations about aging and mood amidst a global pandemic, showing similar ratings of pleasant mood, positive mood, and expectations regarding aging before and during the pandemic and rating

mood and expectations about aging more positively than younger adults, despite being more concerned with the virus and its prevention. In general, older adults tend to have more positive attitudes toward aging than younger adults (Chopik & Giasson, 2017; Kornadt et al., 2017), and these findings suggest that this is also true during a global pandemic even when there is increased societal focus on older adults' vulnerability. Some recent work suggests that positive attitudes about aging can act as a protective factor against stress (Bellingtier & Neupert, 2018; Levy et al., 2016), which could potentially explain why these older adults are maintaining positive attitudes. In addition, our sample of older adults initially rated their mood as fairly positive and pleasant, but their positivity in mood was not reduced by the pandemic.

Both younger and older adults with higher expectations regarding aging tended to have higher mood, better health, and experience less loneliness, suggesting that maintaining high expectations regarding aging is related to positive outcomes like health and mood, consistent with prior work (e.g., Pietrzak et al., 2014). Although we cannot make claims about the direction of these constructs in the current study, the stereotype embodiment theory (Levy, 2009) posits that older adults may internalize attitudes about aging, leading to influences on their health and everyday behaviors. In addition, positive attitudes have been shown to protect against cognitive decline and stress (Levy et al., 2016; Levy et al., 2018), which may affect health status and mood. However, older adults did report more negative mood and greater arousal during the pandemic than before, despite maintaining positive mood, suggesting that the pandemic may have some influence on older adults' mood, but that overall older adults are demonstrating resilience.

Additionally, COVID-19 attitudes and behaviors did not seem to be related to mood or expectations in older adults (and were related to loneliness in Study 1 only), but were related to

mood in younger adults, such that those who took COVID-19 less seriously reported more

unpleasant mood. This finding suggests that older adults' mood may be less affected by their

opinions about the pandemic than younger adults' and further suggests that older adults are

resilient during this global pandemic, despite being more at-risk for serious complications.

Although these findings suggest some older adults are resilient during a global pandemic,

it is important to interpret the results in light of sample demographics. In general, our samples

were overwhelmingly White and educated. In addition, older adults in Study 1 were mostly high-

income, though participants in Study 2 did have greater variation in income. This limitation in

Study 1 was inherently present due to the nature of our local older adult subject pool and

collecting these follow-up data during the COVID-19 pandemic was not an event we anticipated.

This motivated the collection of a more diverse, nationally-representative sample of participants

through the CloudResearch platform in Study 2, and this sample is similar in demographics to

recent studies on COVID-19 and aging (e.g., Barber & Kim, 2020).

These findings have implications for both future research and practice. We find that some

older adults are resilient and maintaining positive attitudes, and future research may seek to

determine what factors contribute to this resilience, such as positive attitudes about aging (e.g.,

Bellingtier & Neupert, 2018; Levy et al., 2016), an increase in focus on close friends and family

during challenging times, consistent with socioemotional selectivity theory (e.g., Fung &

Carstensen, 2006), and/or demographic factors. In addition, younger adults do not seem to be as

resilient (although we do not have data from these measures prior to the onset of the pandemic).

Thus, future work can examine why younger adults are less resilient, and clinical practice may

focus on improving mood and resiliency in younger adults. Finally, males reported less serious

attitudes and prevention intent toward COVID-19 than females, consistent with other recent

work (e.g., Capraro & Barcelo, 2020; Galasso et al., 2020), and this was true for both older and younger adults. However, males make up a larger portion of hospitalizations and deaths (Jin et al., 2020), so it is important to target this demographic to prevent the spread of COVID-19 and increase preventive behaviors.

 In sum, despite imposed social distancing measures that may have reduced typical levels of social interaction and financial stability, older adults in the current studies maintained their overall mood and expectations regarding aging compared to before the onset of the pandemic, while younger adults reported lower expectations about aging and mood compared to older adults, suggesting some older adults may be steadfast in the face of a global pandemic.

References

Administration on Aging. (2018). 2017 profile of older Americans. Retrieved from

https://www.acl.gov/sites/default/files/

Aging%20and%20Disability%20in%20America/2017Older AmericansProfile.pdf

Ayalon, L. (2018). Loneliness and anxiety about aging in adult day care centers and continuing

care retirement communities. *Innovation in Aging, 2*(2), igy021.

https://doi.org/10.1093/geroni/igy021

Ayalon, L., Chasteen, A., Diehl, M., Levy, B. R., Neupert, S. D., Rothermund, K., Tesch-Romer,

C., & Wahl, H.-W. (2020). Aging in times of the COVID-19 Pandemic: Avoiding ageism

and fostering intergenerational solidarity. *The Journals of Gerontology: Series B.*

Barber, S. J., & Kim, H. (2020). COVID-19 worries and behavior changes in older and younger

men and women. *Journals of Gerontology: Psychological Sciences*.

Bellingtier, J. A., & Neupert, S. D. (2018). Negative aging attitudes predict greater reactivity to

daily stressors in older adults. *The Journals of Gerontology: Series B, 73*(7), 1155–1159.

https://doi.org/10.1093/geronb/gbw086

Breda, A. I., & Watts, A. S. (2017). Expectations regarding aging, physical activity, and physical

function in older adults. *Gerontology and Geriatric Medicine*, *3*, 1–8.

Capraro, V., & Barcelo, H. (2020). The effect of messaging and gender on intentions to wear a

face covering to slow down COVID-19 transmission. *ArXiv preprint arXiv:2005.05467.*

Retrieved from: https://arxiv.org/ftp/arxiv/papers/2005/2005.05467.pdf

CDC. (2020). *Severe outcomes among patients with Coronavirus Disease 2019 (COVID-19)*

(No. 69; Morbidity and Mortality Weekly Report, pp. 343–346). US Department of

Health and Human Services, CDC.

https://www.cdc.gov/mmwr/volumes/69/wr/mm6912e2.htm#contribAff

Chandler, J., Rosenzweig, C., Moss, A. J., Robinson, J., & Litman, L. (2019). Online panels in

social science research: Expanding sampling methods beyond Mechanical Turk. *Behavior

Research Methods*, 51(5), 2022–2038. https://doi.org/10.3758/s13428-019-01273-7

Chang, E., Kannoth, S., Levy, S., Wang, S., Lee, J. E., & Levy, B. R. (2020). Global reach of

ageism on older persons' health: A systematic review. *PLoS one, 15*(1), e0220857.

https://doi.org/10.1371/journal.pone.0220857

Chopik, W. J., & Giasson, H. L. (2017). Age differences in explicit and implicit age attitudes

across the lifespan. *The Gerontologist, 57*(2), S169–S177.

https://doi.org/10.1093/geront/gnx058

Fung, H. H., & Carstensen, L. L. (2006). Goals change when life's fragility is primed: Lessons

learned from older adults, the September 11 attacks and SARS. *Social Cognition, 24*(3),

248-278. https://psycnet.apa.org/doi/10.1521/soco.2006.24.3.248

Galasso, V., Pons, V., Profeta, P., Becher, M., Brouard, S., & Foucault, M. (2020). Gender

differences in COVID-19 related attitudes and behavior: Evidence from a panel survey in

eight OECD countries (NBER Working Paper 27359). Cambridge, MA: National Bureau

of Economic Research. Retrieved from: https://www.nber.org/papers/w27359.pdf

Garg, S. (2020). Hospitalization Rates and Characteristics of Patients Hospitalized with

Laboratory-Confirmed Coronavirus Disease 2019—COVID-NET, 14 States, March 1–

30, 2020. *MMWR. Morbidity and Mortality Weekly Report*, *69*(15), 458–464.

https://doi.org/10.15585/mmwr.mm6915e3

Gerst-Emerson, K., & Jayawardhana, J. (2015). Loneliness as a public health issue: the impact of loneliness on health care utilization among older adults. *American Journal of Public Health*, 105(5), 1013–1019.

Han, J., & Richardson, V. E. (2014). The relationships among perceived discrimination, self-perceptions of aging, and depressive symptoms: A longitudinal examination of age discrimination. *Aging & Mental Health, 19*(8), 747–755. https://doi.org/10.1080/13607863.2014.962007

Hauser, A., Counotte, M. J., Margossian, C. C., Konstantinoudis, G., Low, N., Althaus, C. L., & Riou, J. (2020). Estimation of SARS-CoV-2 mortality during the early stages of an epidemic: A modelling study in Hubei, China and Northern Italy. *MedRxiv*.

Huff, C., & Tingley, D. (2015). "Who are these people?" Evaluating the demographic characteristics and political preferences of MTurk survey respondents. *Research & Politics*, *2*(3), 1–12. https://doi.org/10.1177%2F2053168015604648

Hughs, M., Waite, L., Hawkley, L., & Cacioppo, J. (2004). A short scale for measuring loneliness in large surveys. *Research on Aging*, *26*, 655–72.

Jaremka, L. M., Andridge, R. R., Fagundes, C. P., Alfano, C. M., Povoski, S. P., Lipari, A. M., Agnese, D. M., Arnold, M. W., Farrar, W. B., Yee, L. D., Carson, W. E. III, Bekaii-Saab, T., Martin, E. W., Jr., Schmidt, C. R., & Kiecolt-Glaser, J. K. (2014). Pain, depression, and fatigue: Loneliness as a longitudinal risk factor. *Health Psychology*, 33(9), 948–957. https://doi.org/10.1037/a0034012

Jin, J.-M., Bai, P., He, W., Wu, F., Liu, X.-F., Han, D.-M., Liu, S., & Yang, J.-K. (2020). Gender differences in patients with COVID-19: Focus on severity and mortality. *Frontiers in Public Health, 8,* 152. https://doi.org/10.3389/fpubh.2020.00152

Kassambara, A. (2019). ggcorrplot: Visualization of a Correlation Matrix using 'ggplot2'. R

    package version 0.1.3. https://CRAN.R-project.org/package=ggcorrplot

Kornadt, A. E., Voss, P., & Rothermund, K. (2017). Age stereotypes and self-views revisited:

    Patterns of internalization and projection processes across the lifespan. *The Journals of*

    Gerontology: Series B, 72(4), 582–592. https://doi.org/10.1093/geronb/gbv099

Kruschke, J. K. (2013). Bayesian estimation supersedes the t test. *Journal of Experimental*

    Psychology: General, *142*, 573–603.

Lee, M. D., & Wagenmakers, E. J. (2013). *Bayesian cognitive modeling: A practical course.*

    Cambridge University Press.

Levy, B. R. (2009). Stereotype embodiment: A psychosocial approach to aging. *Current*

    Directions in Psychological Science, *18*(6), 332–336. https://doi.org/10.1111/j.1467-

    8721.2009.01662.x

Levy, B. R., Moffat, S., Resnick, S. M., Slade, M. D., & Ferrucci, L. (2016). Buffer against

    cumulative stress: Positive age self-stereotypes predict lower cortisol across 30 years.

    GeroPsych, 29, 141–146. https://doi.org/10.1024/1662-9647/a000149

Levy, B. R., Slade, M. D., Pietrzak, R. H., & Ferrucci, L. (2018). Positive age beliefs protect

    against dementia even among elders with high-risk gene. *PLoS one, 13*(2), e0191004.

    https://doi.org/10.1371/journal.pone.0191004

Mayer, J. D. (2018). Brief Mood Introspection Scale (BMIS): Technical and scoring manual (2nd

    edition). Retrieved from https://mypages.unh.edu/sites/default/files/jdmayer/files/bmis-

    technical_supplement_for_scoring.pdf

Mayer, J. D., & Gaschke, Y. N. (1988). The experience and meta-experience of mood. *Journal of*

    Personality and Social Psychology, *55*, 102–111.

Menkin, J. A., Robles, T. F., Gruenewald, T. L., Tanner, E. K., & Seeman, T. E. (2017). Positive

    expectations regarding aging linked to more new friends in later life. *Journals of*

    Gerontology: Series B, *72*(5), 771-781. https://doi.org/10.1093/geronb/gbv118

Neuwirth, E. (2014). RColorBrewer: ColorBrewer Palettes. R package version 1.1-2.

    https://CRAN.R-project.org/package=RColorBrewer

Ong, A. D., Uchino, B. N., & Wethington, E. (2016). Loneliness and health in older adults: A

    mini-review and synthesis. *Gerontology, 62*, 443–449. https://doi.org/10.1159/000441651

Pietrzak, R. H., Tsai, J., Kirwin, P. D., & Southwick, S. M. (2014). Successful aging among

    older veterans in the United States. *The American Journal of Geriatric Psychiatry*, *22*(6),

    551-563. https://doi.org/10.1016/j.jagp.2012.11.018

Powell, D., Weisman, K., & Markman, E. M. (2018). Articulating lay theories through graphical

    models: A study of beliefs surrounding vaccination decisions. *Proceedings of the 40th*

    Annual Conference of the Cognitive Science Society, 906–911.

Priniski, J. H. (preregistration). Shifting and politically diverging attitudes towards COVID-19.

    Retrieved from https://jpriniski.github.io/docs/PREREGISTRATION.pdf

R Core Team. (2020). R: A language and environment for statistical computing. R Foundation

    for Statistical Computing, Vienna, Austria. URL http://www.R-project.org/.

Sarkisian, C. A., Steers, W. N., Hays, R. D., & Mangione, C. M. (2005). Development of the 12-

    item Expectations Regarding Aging survey. *The Gerontologist*, *45*(2), 240–248.

Shiovitz-Ezra S., Shemesh J., & McDonnell/Naughton M. (2018). Pathways from ageism to

    loneliness. In: L. Ayalon, C. Tesch-Römer (Eds.), *Contemporary perspectives on ageism*,

    (pp. 131–147). Springer, Cham. https://doi.org/10.1007/978-3-319-73820-8_9

Swift, H. J., Abrams, D., Lamont, R. A., & Drury, L. (2017). The Risks of Ageism Model: How

 ageism and negative attitudes toward age can be a barrier to active aging. *Social Issues

 and Policy Review, 11*(1), 195–231. https://doi.org/10.1111/sipr.12031

Wagenmakers, E. J., Verhagen, J., Ly, A., Matzke, D., Steingroever, H., Rouder, J. N., & Morey,

 R. D. (2017). The need for Bayesian hypothesis testing in psychological science. In S. O.

 Lilienfeld & I. Waldman (Eds.), *Psychological science under scrutiny: Recent challenges

 and proposed solutions* (pp. 123-138). Wiley.

Wei, T., & Simko, V. (2017). R package "corrplot": Visualization of a Correlation Matrix

 (Version 0.84). Available from https://github.com/taiyun/corrplot

Table 1

Demographic Information for Participants in Studies 1 and 2

	Study 1	Study 2	
Age Group	Older Adults	Younger Adults	Older Adults
Total N (n females)	49 (23)	115 (54)	115 (51)
Age			
Mean (SD)	73.90 (7.50)	25.15 (3.63)	69.70 (6.16)
Range	61-91	18-30	60-90
Race/Ethnicity			
American Indian	2%	2%	1%
Asian/Pacific Islander	4%	13%	3%
Black	0%	9%	2%
Hispanic/Latino	0%	0%	0%
Other	0%	7%	2%
Unknown or not reporting	0%	2%	1%
White	94%	67%	91%
Education			
Some high school	0%	3%	1%
High school degree	2%	21%	12%
Associate degree	0%	4%	9%
Some college	0%	21%	19%
Bachelor's degree	51%	33%	36%
Graduate degree	47%	17%	23%
Other	0%	1%	0%
Income			
$0-$24,999	–	21%	12%
$25,000-$49,999	–	17%	27%
$50,000-$74,999	–	21%	29%
$75,000-$99,999	–	12%	10%
$100,000-$124,000	–	15%	7%
$125,000-$149,999	–	9%	10%
$150,000+	–	5%	5%
Self-reported health			
Mean (SD)	8.10 (1.56)	7.86 (1.97)	6.47 (2.29)

Note: Study 1 participants' data from Time 2. Self-reported health was provided on a scale from 1 (poor) to 10 (excellent).

Table 2

Means (and Standard Deviations) of All Measures in Study 1 and Study 2

| Measure (and Score Range)	Study 1		Study 2	
	Time 1	Time 2	Younger	Older
Expectations Regarding Aging				
ERA Total Score (0–100)	53.29 (19.03)	53.06 (16.33)	36.23 (18.69)	50.24 (15.73)
Physical Health (0–100)	43.03 (24.08)	45.24 (20.13)	32.46 (19.60)	40.94 (19.48)
Mental Health (0–100)	71.94 (22.68)	68.54 (20.50)	43.77 (24.70)	65.51 (20.17)
Cognitive Function (0–100)	44.90 (22.43)	45.41 (22.38)	32.46 (19.26)	44.28 (18.58)
Brief Mood Introspection Scale				
Pleasant-Unpleasant (16–112)	90.75 (13.42)	87.87 (13.31)	70.28 (15.71)	82.85 (15.79)
Arousal-Calm (12–84)	43.89 (6.89)	46.98 (5.85)	46.38 (9.67)	43.26 (7.30)
Positive-Tired (7–49)	36.77 (7.95)	37.45 (6.01)	29.37 (6.87)	33.88 (7.59)
Negative-Relaxed (6–42)	12.13 (5.59)	14.92 (6.87)	21.41 (8.60)	14.95 (7.32)
Overall Mood (-10–10)	7.17 (2.44)	7.06 (3.16)	5.01 (4.48)	5.68 (3.57)
COVID-19 Scale				
Total (13–91)	–	22.71 (7.31)	36.33 (13.32)	24.21 (9.11)
Attitudes (7–49)	–	13.33 (4.32)	21.38 (7.79)	14.26 (5.76)
Prevention (6–42)	–	9.39 (4.96)	19.95 (6.85)	9.95 (4.42)
Loneliness Scale				
Total (3–9)	–	4.49 (1.79)	5.39 (1.84)	4.59 (1.76)
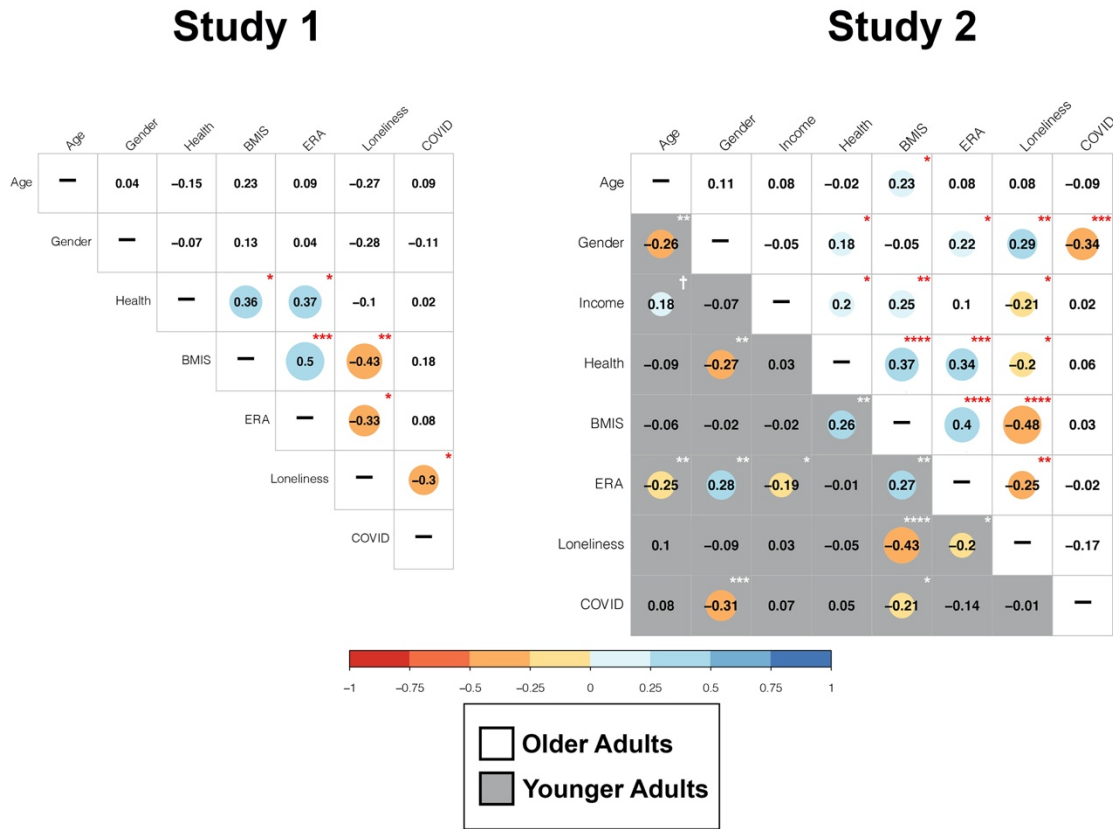
Figure 1. Pearson's correlations between measures from older adults in Study 1 (left) and younger and older adults in Study 2 (right). Each cell shows the correlation coefficients, with significant correlations containing a circle (*p*-values are presented in the top-right corner). The size and color of each circle is proportional to the magnitude of the correlation, with cooler colors indicating positive correlations and warmer colors indicating negative correlations.

Note: †*p* = .05, *p < .05, **p < .01, ***p < .001, ****p < .0001