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Intervention Research

Reducing Ageism: Education About Aging and Extended Contact With Older Adults

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Abstract

Background and Objectives: Ageism is of increasing concern due to the growing older population worldwide and youth-centered focus of many societies.
Research Design and Methods: The current investigation tested the PEACE (Positive Education about Aging and Contact Experiences) model for the first time. Two online experimental studies examined 2 key factors for reducing ageism: education about aging (providing accurate information about aging) and extended contact (knowledge of positive intergenerational contact) as well as their potential combined effect (education plus extended contact).
Results and Discussion: In Study 1, 354 undergraduates in all 3 experimental conditions (vs. control participants) reported less negative attitudes toward older adults (delayed post-test) and greater aging knowledge (immediate and delayed post-tests), when controlling for pre-study attitudes. In Study 2, 505 national community participants (ages 18–59) in all experimental conditions (vs. control participants) reported less negative attitudes toward older adults (immediate post-test) and greater aging knowledge (immediate and delayed post-tests). In summary, across 2 online studies, education about aging and knowledge of intergenerational extended contact improved attitudes toward older adults and aging knowledge.
Implications: Thus, brief, online ageism-reduction strategies can be an effective way to combat ageism. These strategies hold promise to be tested in other settings, with other samples, and to be elaborated into more in-depth interventions that aim to reduce ageism in everyday culture.

Keywords: Experimental design, Intervention, Intergenerational relationships, Prejudice reduction

The worldwide older population is rapidly growing and will increase to 2 billion by 2050 (WHO, 2015). Unfortunately, ageism (stereotyping and prejudice toward older adults) persists in the United States (Levy & Macdonald, 2016; Palmore, 1990). Older adults are stereotyped as being cranky, depressed, lonely, poor, senile, sick, unable to learn, unattractive, and useless or unable to work effectively (Levy, Kasl, & Gil, 2004; Nelson, 2009). Older adults face discrimination in everyday settings including in health care and employment (Harris, Krygsman, Waschenko, & Rudman, 2017; Levy & Macdonald, 2016; Pillemer, Connolly, Breckman, Spreng, & Lachs, 2015). Moreover, older adults who are exposed to negative views of aging perform worse on cognitive tasks, have poorer health, and live shorter lives (Abrams, Eller, & Bryant, 2006; Levy, Slade, Kunkel, & Kasl, 2002). As such, there is an urgent need to reduce ageism.

Ageism reduction interventions are not common, have mixed or inconclusive results, and some lack a theoretical or guiding framework to reduce ageism (Levy, 2016). Levy (2016) proposed PEACE (Positive Education about Aging and Contact Experiences), a theoretical model for reducing ageism

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focusing on two promising factors: education about aging and positive contact experiences with older adults, which are reviewed next. The PEACE model has not been empirically tested, which is the main goal of the current studies.

Education About Aging

Negative, inaccurate depictions of older adults and aging can be found in the mass media and everyday culture (Marshall, 2015; Nelson, 2009; Palmore, 1990). Indeed, stereotypes of older adults have become more negative over the past 200 years (Ng, Allore, Trentalange, Monin, & Levy, 2015). Additionally, there is little formal schooling about aging, thus, one cause of ageism is thought to be lack of education about aging (Levy, 2016).

There is some evidence that education about aging is effective in reducing ageism (Boswell, 2012; McCleary, 2014; Ragan & Bowen, 2001). For example, Wurtele and Maruyama (2013) had undergraduates in a lifespan human development course write down five activities that came to mind when thinking of older adults (e.g., watching television). In the subsequent class, accurate information about older adults (e.g., 35% of 65- to 74-year olds volunteer) was provided. Ageism was significantly reduced in an immediate post-test following the presentation of accurate aging information and a discussion on ageism (Wurtele & Maruyama, 2013). Similarly, Angiullo, Whitbourne, and Powers (1996) found students' attitudes and knowledge about older adults improved after enrolling in a psychology of aging class compared to students in a personality psychology course. Moreover, McCleary (2014) found that nursing and social work students who watched a documentary on aging and interacted with healthy older adults reported an increase in aging knowledge and more positive attitudes toward aging.

A systematic review of 58 studies found pedagogical interventions designed to increase aging knowledge resulted in improved attitudes toward older adults and greater aging knowledge (Chonody, 2015). Thirty-five of these studies utilized a pre-/post-test design but only a few used a control group (typically comparing students enrolled in an aging specific course to those enrolled in other courses). Thus, the current investigation importantly uses control groups with random assignment. Also, it is important to note that despite general support that education improves attitudes, some research suggests educational approaches do not affect behavioral outcomes such as increased intent to work with older adults (Chonody, 2015; Gordon, Nelson-Becker, Chapin, & Landry, 2007).

Extended Contact

Misinformation and widespread stereotypes about aging may be perpetuated by insufficient positive intergenerational contact. An extensive body of research deriving from intergroup contact theory suggests that negative intergroup attitudes stem in part from lack of positive contact between group members (Allport, 1954; Brown & Hewstone, 2005; Pettigrew & Tropp, 2006). Indeed, studies show that positive contact with older adults is predominately associated with less ageism (Abrams et al., 2006; Bousfield & Hutchison, 2010; Kalisch, Coughlin, Ballard, & Lamson, 2013; McCleary, 2014).

Since in-person contact is only one kind of contact and is not always possible, researchers have expanded the original conception of intergroup contact theory to include additional types of contact. Moreover, researchers have sought to address the consistent findings that the positive effects of contact are strongest for close relationships (e.g., friendships) and when the identities of the individuals are made salient. The Extended Contact Theory (Wright, Aron, McLaughlin-Volpe, & Rupp, 1997) focuses on contact that is not in-person but includes the aforementioned friendship and identity components. Specifically, this theory proposes that knowledge that one's friends from the same group (e.g., other young adults) have friends from another group (e.g., older adults) provides many of the same benefits of having in-person intergenerational friendships, such as more positive attitudes toward older adults. A sizeable literature supports the efficacy of extended contact in reducing prejudice (Aronson et al., 2016; Cameron, Rutland, Hossain, & Petley, 2011; Eller, Abrams, & Gomez, 2012; Turner, Hewstone, Voci, & Vonofakou, 2008). Specific to ageism, Drury, Hutchison, and Abrams (2016) found that undergraduate students who indicated more extended contact (i.e., friends who had positive relations with older adults) reported more positive attitudes toward older adults.

These findings suggest that extended contact is a promising approach to reducing ageism. Extended contact sidesteps concerns about infrequent intergenerational contact and negative in-person interactions experienced in everyday settings such as the workplace and health care (Drury et al., 2016; Levy & Macdonald, 2016; North & Fiske, 2012).

Overview of Studies

Drawing on the literature and PEACE model (Levy, 2016), the current studies examine whether education about aging and positive extended contact reduce ageism. As noted, studies examining education about aging have yielded some mixed findings and tend to be conducted with students who chose to enroll in aging courses and control groups who also self-selected into courses without aging content. Thus, one goal of the current studies is to examine the effectiveness of educational approaches by building on the strengths of past research while also addressing some methodological weaknesses (lack of random assignment, control groups, restricted samples). Although there are a few correlational studies examining extended contact and ageism (Drury et al., 2016), to our knowledge, there are no experimental studies of extended contact and ageism, thus a second goal was to experimentally test extended contact as an ageism

reduction strategy. The PEACE model suggests that education about aging and positive intergenerational contact may work together to reduce ageism because education provides overarching knowledge about aging whereas intergenerational contact involves concrete and accessible examples of older adults that challenge pervasive stereotypes (Levy, 2016); thus, another novel and exploratory goal was to test the combined effects of these two factors.

Study 1

Study 1 involved a pre-test (Time 1), immediate post-test (Time 2), and a delayed post-test (Time 3). We hypothesize that all three ageism reduction strategies (education about aging, extended intergenerational contact, combined condition) will result in less negative attitudes towards older adults and greater aging knowledge compared to the control condition. Further, we examined exploratory hypotheses regarding the possible superiority of the combined condition compared to either education or extended contact.

Methods

Participants

There were 354 (257 female) undergraduate participants with a mean age of 19.69 (*SD* = 1.90). Participants included 46.0% European American, 26.3% Asian, 8.2% African American or Black Caribbean, 6.8% Latino/Latina, and 12.7% Other or Mixed. Participants were removed for not providing meaningful information (*n* = 39; e.g., 12345, n/a) in at least two of the four attention checks, being 30 years or older (*n* = 2), for indicating English was not their first language (*n* = 12), and participating more than once (*n* = 40).

Procedure

Potential participants logged onto the psychology subject pool to register for Time 1 (pre-test survey), which was described as a stand-alone online Qualtrics survey concerning their "attitudes and beliefs about groups" which included the main ageism-related measures described in the measures section as well as filler items (shortened versions of egalitarianism, social dominance orientation, Protestant work ethic, and modern sexism) to fit with the cover story. Time 1 participants received a debriefing afterwards.

Eligible participants were invited to participate in an online study (Time 2) 1 week after completing Time 1 (consistent with timing from Malinen & Johnston, 2013); however, participants were not told that Time 2 was connected to Time 1. Participants were randomly assigned to the education, extended contact, combined (education plus extended contact), or control conditions. Participants were told the study objective was to "examine people's ability to read and comprehend material online," which involved

answering true/false questions. Participants in the experimental conditions answered the same 10 true/false aging questions (e.g., "depression is more frequent among older adults than among younger people"; Palmore, 1998) whereas control participants answered 10 true/false questions about a neutral topic: wallpaper ("Wallpaper is generally difficult to clean and maintain"). After participants answered each question, the correct response was provided (true or false) along with a few sentences of elaboration.

Education condition participants received factual information ("False – actually, major depression (or what is known as clinical depression) is less prevalent among older adults than among younger persons..."). Answers were adapted from Breytspraak and Badura (2015) and Heimstra (2011). In response to the same question, extended contact condition participants received a description of an intergenerational relationship ("False - Max (age 22 years) …admires Charles' positive take on life and hopes to be more like him…"). Combined condition participants received both explanations. Control condition participants received greater detail about wallpaper questions ("False – wallpaper is far easier to clean up or maintain when compared to paint…").

After participants answered the 10 true/false questions associated with their condition and received elaborations of the 10 correct answers, participants completed a supposedly separate study regarding their "attitudes and beliefs toward various social groups." The measures are described subsequently in the order in which participants received them. Participants completed the same filler measures from Time 1 to fit with the cover story. The last page included a debriefing.

One week after completing Time 2, participants were invited to complete Time 3 (delayed post-test), which included the same measures from Time 2 (minus the filler items). Participants received a full debriefing following Time 3. The university's institutional review board approved this research.

Measures (Measures Marked With an Asterisk Were Included in Times 1, 2, and 3)

Attention and Mood Checks

To assess whether participants were paying attention to the material they were reading, they were asked to list three things they remembered every few questions (resulting in three check-ins) and provided an overall summary after the "reading comprehension" portion (fourth check-in). To test whether the material they read influenced their mood, participants were asked "how do you feel right now" on a scale of –6 (*very negative/very sad*) to +6 (*very positive/very happy*)? A one-way ANOVA revealed no difference in mood across conditions.

Ageism Measure*

Participants rated 22 items concerning their attitudes toward older adults (Fraboni, Saltstone, & Hughes, 1990) on a 1 (*strongly disagree*) to 6 (*strongly agree*) scale (Time

1 α = .88, Time 2 α = .90, Time 3 α = .93; "many old people are stingy and hoard their money and possessions").

Positive Age Stereotypes and Negative Age Stereotypes*
Participants rated nine positive age stereotypes (PAS; "active"; Time 1 α = .82, Time 2 α = .87, Time 3 α = .90) and nine negative age stereotypes (NAS) of older adults ("walks slowly"; Time 1 α = .88, Time 2 α = .90, Time 3 α = .92) on a 0 (*not at all characteristic*) to 6 (*very characteristic*) scale (Levy et al., 2004).

Feeling Thermometer*
Participants rated two items concerning their feelings toward 65–70 (as well as filler items regarding younger ages) year olds (Turner & Crisp, 2010) on a 0 (*cold/negative*) to 100 (*warm/positive*) scale (Time 1 r = .64, Time 2 r = .83, Time 3 r = .83).

Aging Anxiety
Participants rated four items (Bousfield & Hutchison, 2010) on a 1 (*strongly disagree*) to 6 (*strongly agree*) scale (Time 2 α = .72, Time 3 α = .78; "I am concerned that my abilities will suffer when I am old").

Anxiety about Interacting with Older Adults
Participants rated three items (Hutchison, Fox, Laas, Matharu, & Urzi, 2010) on a 1 (*strongly disagree*) to 6 (*strongly agree*) scale (Time 2 α = .84, Time 3 α = .87; "I would feel awkward when interacting with an elderly person").

Behavioral Intentions
Participants rated five items (Bousfield & Hutchison, 2010) on a 1 (*strongly disagree*) to 6 (*strongly agree*) scale (Time 2 α = .63, Time 3 α = .71; "I would not give money to someone collecting for an organization which helps older adults").

Anti-age Discrimination Petition
Participants had the option to sign their initials (1 = signed, 0 = not signed) to an anti-age discrimination petition, a measure of intended (positive) behavior toward older adults.

Aging Knowledge
Palmore's (1998) Facts on Aging quiz was slightly updated and reduced to 10 true/false questions.

Demographics*
Participants reported their age, gender, race/ethnicity, income, education level, whether English was their first language, and whether they currently lived in the U.S. Participants completed a two-item quantity of contact ("In the past, I have rarely interacted with elderly people") and three-item quality of contact measure ("Over the course of my life I have had many elderly people as friends";

Hutchison et al., 2010) on a 1 (*strongly disagree*) to 6 (*strongly agree*) scale (α = .86).

Results
Multivariate analyses of covariance (MANCOVAS) were used to examine potential differences among conditions. When warranted, follow-up analyses included three planned contrasts, testing (a) our main hypothesis that all three experimental conditions differed from the control condition and exploratory hypotheses about (b) whether the combined condition was superior to the education condition or (c) whether the combined condition was superior to the extended contact condition. Table 1 includes means, standard deviations, and significant effects for each measure by condition.

Consistent with past research (Fraboni et al., 1990), men (M = 2.69, SD = 0.58) reported significantly more negative attitudes toward older adults than women (M = 2.40, SD = 0.58), t (349) = 4.11, p < .01. Thus, gender was controlled for as was quality/quantity of contact.

Immediate Post-test (Time 2)
A MANCOVA (controlling for Time 1) revealed a significant effect of condition on attitudes toward older adults, F (27, 1014) = 6.27, p < .01, eta squared (η^2) = .14. Separate ANCOVAs revealed a significant effect for PAS, F (3, 344) = 6.94, p < .01, η^2 = .06, NAS, F (3, 344) = 3.82, p < .05, η^2 = .03, aging anxiety, F (3, 344) = 3.95, p < .01, η^2 = .03, and aging knowledge, F (3, 344) = 64.78, p < .001, η^2 = .36. There were no significant effects for the ageism measure (F [3, 344] = 2.06, p = .11, η^2 = .02), feeling thermometer (F [3, 344] = 1.20, p = .31, η^2 = .01), behavioral intentions (F [3, 344] = 1.45, p = .23, η^2 = .01), anxiety about interacting with older adults (F < 1), or the anti-age discrimination petition (F < 1).

For PAS, the first contrast revealed that experimental condition participants reported significantly more PAS than control condition participants, t (352) = 3.68, p < .01, d = 0.45. The second and third contrasts revealed no significant differences between the combined and education conditions, t (178) = 0.23, p = .82 or combined and extended contact conditions, t (178) = –0.55, p = .58.

For NAS, experimental condition participants reported significantly less NAS than control condition participants, t (352) = –2.75, p < .01, d = –0.34. There were no significant differences between the combined and education conditions, t (178) = 0.90, p = .37 or combined and extended contact conditions, t (178) = 0.72, p = .47.

However, for aging anxiety, experimental condition and control condition participants did not significantly differ, t (352) = 0.44, p = .66. Interestingly, education condition participants reported significantly more aging anxiety than combined condition participants, t (178) = 3.35, p < .01, d = 0.49. There was no significant difference between the combined and extended contact conditions, t (178) = 1.35, p = .18.

Table 1. Study 1: Means, Standard Deviations, and Significant Effects for all Measures by Conditions

	Education (*n* = 86)	Ext Contact (*n* = 86)	Combined (*n* = 94)	Control (*n* = 88)
Fraboni ageism measure				
Time 1	2.46 (0.64)	2.50 (0.58)	2.49 (0.57)	2.46 (0.58)
Time 2	2.28 (0.64)	2.27 (0.61)	2.25 (0.62)	2.38 (0.65)
Time 3	2.42 (0.63)[a]	2.36 (0.68)[a]	2.39 (0.64)[a]	2.55 (0.63)
Positive age stereotypes				
Time 1	4.85 (0.66)	4.78 (0.71)	4.78 (0.62)	4.74 (0.70)
Time 2	5.06 (0.75)[a]	4.98 (0.73)[a]	5.04 (0.73)[a]	4.70 (0.68)
Time 3	4.90 (0.80)	4.93 (0.89)	4.98 (0.77)	4.74 (0.72)
Negative age stereotypes				
Time 1	3.54 (0.92)	3.49 (1.07)	3.36 (0.85)	3.49 (0.99)
Time 2	3.34 (0.90)[a]	3.32 (0.94)[a]	3.22 (0.96)[a]	3.61 (0.99)
Time 3	3.32 (0.99)	3.36 (1.03)	3.23 (1.07)	3.51 (0.99)
Feeling thermometer				
Time 1	8.09 (1.75)	8.27 (1.51)	8.04 (1.75)	8.04 (1.56)
Time 2	8.11 (1.79)	8.15 (1.55)	8.27 (1.78)	7.90 (1.60)
Time 3	8.14 (1.69)	8.16 (1.63)	8.33 (1.64)	7.85 (1.65)
Aging anxiety				
Time 2	4.10 (1.02)	3.79 (0.94)	3.60 (0.99)[b]	3.77 (1.02)
Time 3	3.97 (1.12)	3.74 (1.03)	3.64 (0.98)	3.82 (0.95)
Aging knowledge				
Time 2	9.64 (0.75)[a]	9.20 (0.91)[a]	9.41 (0.72)[a,b]	7.80 (1.33)
Time 3	9.34 (0.97)[a]	8.88 (1.26)[a]	9.23 (1.04)[a,c]	7.85 (1.47)
Anxiety interacting				
Time 2	2.58 (0.88)	2.52 (0.91)	2.53 (0.95)	2.61 (0.89)
Time 3	2.56 (0.97)	2.50 (0.99)	2.53 (0.95)	2.61 (0.99)
Behavioral intentions				
Time 2	4.53 (0.75)	4.60 (0.66)	4.60 (0.62)	4.45 (0.65)
Time 3	4.58 (0.72)	4.69 (0.74)	4.53 (0.69)	4.51 (0.62)
Petition				
Time 2	0.85 (0.36)	0.88 (0.32)	0.83 (0.38)	0.81 (0.40)
Time 3	0.87 (0.34)	0.91 (0.29)	0.85 (0.36)	0.82 (0.39)

[a]Refers to contrast 1 (all three experimental conditions being significantly different than the control condition). [b]Refers to contrast 2 (combined condition being significantly different than the education condition). [c]Refers to contrast 3 (combined condition being significantly different than the extended contact condition).

For aging knowledge, experimental condition participants reported significantly more aging knowledge than control condition participants, t (352) = 13.64, $p < .001$, $d = 1.68$. Education condition participants reported significantly more aging knowledge than combined condition participants, t (178) = 2.04, $p < .05$, $d = 0.30$. There was no significant difference between the combined and extended contact conditions, t (178) = −1.78, $p = .076$.

Delayed Post-test (Time 3)

A MANCOVA (controlling for Time 1) revealed a significant effect of condition on attitudes toward older adults, F (27, 1014) = 3.59, $p < .01$, $\eta^2 = .09$. Separate ANCOVAs revealed a significant effect for the ageism measure, F (3, 344) = 3.70, $p < .05$, $\eta^2 = .03$ and aging knowledge, F (3, 344) = 28.17, $p < .001$, $\eta^2 = .20$. There were no significant effects for PAS (F [3, 344] = 2.00, $p = .11$, $\eta^2 = .02$), NAS (F [3, 344] = 1.31, $p = .27$, $\eta^2 = .01$), the feeling thermometer (F [3, 344] = 2.16, $p = .09$, $\eta^2 = .02$), behavioral intentions (F [3, 344] = 1.60, $p = .19$, $\eta^2 = .01$), anxiety about interacting with older adults ($F < 1$), or the anti-age discrimination petition ($F < 1$).

For the ageism measure, experimental condition participants reported significantly less negative attitudes toward older adults than control condition participants, t (352) = −1.99, $p < .05$, $d = −0.25$. There were no significant differences between the combined and the education conditions, t (178) = 0.32, $p = .75$ or between the combined and extended contact conditions, t (178) = −0.23, $p = .82$.

For aging knowledge, experimental condition participants reported significantly more aging knowledge than control condition participants, t (352) = 8.98, $p < .001$, $d = 1.10$. There was no significant difference between the combined and education conditions, t (178) = 0.69, $p = .49$. Combined condition participants reported significantly more aging knowledge than extended contact participants, t (178) = −2.04, $p < .05$, $d = 0.30$.

Discussion

Overall, compared to the control condition, participants in all three experimental conditions reported significantly less negative attitudes toward older adults in the delayed post-test and greater aging knowledge of older adults in both the immediate and delayed post-tests. Participants in the experimental conditions (vs. control condition) also reported less endorsement of negative age stereotypes and greater endorsement of positive age stereotypes in the immediate post-test. Unexpectedly, education condition participants reported significantly greater aging anxiety compared to combined condition participants in the immediate post-test. It may be that providing information on aging increased aging anxiety as participants thought about the aging process.

Study 2

Study 2 aimed to replicate Study 1 findings among a national community sample of adults ages 18–59 to address the generalizability of the findings. Consistent with Study 1, Study 2 included the same cover story, key measures, and filler items. Further, a pre-test was not included in Study 2 to address concerns that a pre-test may help participants determine the true study goals and creates a demand for them to give responses consistent with the study goals. As in Study 1, Study 2 included an immediate and a delayed post-test (approximately 1 week later) to assess short- and long-term effects.

Methods

Participants

There were 505 community participants (321 females) ages 18–59 with a mean age of 38.10 ($SD = 10.76$). Participants included 76.7% European American, 7.9% African American or Black Caribbean, 5.7% Latino/Latina, 5.2% Asian, and 4.3% Other or Mixed. Participants were removed for not providing meaningful information ($n = 13$, e.g., 12345, n/a) in at least two of the four attention checks, being 60 years or older ($n = 4$), and for indicating English was not their first language ($n = 1$). Community participants were recruited using Amazon's Mechanical Turk (MTURK; a crowdsourcing marketplace for participants), which has been shown to provide quality community data (Mason & Suri, 2012).

Measures

As in Study 1, measures included the Fraboni ageism measure (Time 1 $\alpha = .92$, Time 2 $\alpha = .93$), PAS (Time 1 $\alpha = .83$, Time 2 $\alpha = .88$), NAS (Time 1 $\alpha = .91$, Time 2 $\alpha = .89$), aging anxiety (Time 1 $\alpha = .82$, Time 2 $\alpha = .80$), anxiety about interacting with older adults (Time 1 $\alpha = .88$, Time 2 $\alpha = .89$), behavioral intentions (Time 1 $\alpha = .83$, Time 2 $\alpha = .86$), and aging knowledge (modified to a multiple-choice format). The anti-age discrimination petition was not included because of the lack of variability with this measure in Study 1. The same demographics and attention checks were used.

Results and Discussion

Consistent with the Study 1, MANCOVAs examined potential differences between conditions and quality/quantity of contact and gender was controlled for. Furthermore, the same three planned contrasts were examined. Table 2 includes means, standard deviations, and significant effects for all measures by conditions.

Immediate Post-test

A MANCOVA revealed a significant effect of condition on attitudes toward older adults, $F (21, 1452) = 8.82$, $p < .01$, eta squared (η^2) = .11 when controlling for gender and quality/quantity of contact with older adults. Separate ANCOVAs revealed a significant effect for the ageism measure, $F (3, 488) = 4.80$, $p < .001$, $\eta^2 = .03$, PAS, $F (3, 488) = 4.38$, $p < .001$, $\eta^2 = .026$, and aging knowledge, $F (3, 488) = 66.09$, $p < .001$, $\eta^2 = .29$. There were no significant effects for aging anxiety ($F [3, 488] = 1.35$, $p = .26$, $\eta^2 = .008$), NAS, ($F < 1$), behavioral intentions ($F < 1$), and anxiety about interacting with older adults ($F < 1$).

As in Study 1, for PAS, experimental condition participants reported significantly more PAS than control condition participants (first planned contrast), $t (505) = 3.15$, $p < .01$, $d = 0.31$. There were no significant differences between the combined and education conditions (second contrast), $t (249) = 0.43$, $p = .67$ or between the combined and extended contact conditions (third contrast), $t (253) = 1.21$, $p = .23$.

For the ageism measure, experimental condition participants reported significantly less negative attitudes toward older adults compared to control condition participants, $t (505) = -3.63$, $p < .001$, $d = 0.36$. There were no significant differences between the combined and education conditions, $t (249) = -0.72$, $p = .47$ or combined and extended contact conditions, $t (253) = 1.19$, $p = .24$.

As in Study 1, for aging knowledge, experimental condition participants reported significantly greater aging knowledge compared to control condition participants, $t (498) = 14.06$, $p < .001$, $d = 1.27$. There were no significant differences between the combined and education conditions, $t (244) = -0.21$, $p = .84$ or combined and extended contact conditions, $t (250) = 0.99$, $p = .58$.

Delayed Post-test

Similar to Study 1, a MANCOVA revealed a significant effect of condition on attitudes toward older adults, $F (21, 1467) = 5.03$, $p < .01$, $\eta^2 = .07$ when controlling

Table 2. Study 2: Means, Standard Deviations, and Significant Effects for all Measures by Conditions

	Education (n = 122)	Ext contact (n = 125)	Combined (n = 128)	Control (n = 132)
Fraboni ageism measure				
Time 1	2.28 (0.71)[a]	2.23 (0.70)[a]	2.34 (0.77)[a]	2.57 (0.77)
Time 2	2.31 (0.77)	2.33 (0.77)	2.42 (0.79)	2.50 (0.77)
Positive age stereotypes				
Time 1	5.26 (0.83)[a]	5.18 (0.79)[a]	5.31 (0.87)[a]	4.98 (0.83)
Time 2	5.21 (0.88)	5.22 (0.77)	5.23 (0.88)	5.05 (0.79)
Negative age stereotypes				
Time 1	3.06 (1.07)	3.08 (1.01)	3.02 (0.98)	3.21 (1.14)
Time 2	3.21 (1.08)	3.18 (1.05)	3.24 (1.05)	3.22 (1.05)
Aging knowledge				
Time 1	9.33 (1.18)[a]	9.23 (1.16)[a]	9.23 (1.34)[a]	7.14 (2.02)
Time 2	9.02 (1.62)[a]	8.81 (1.58)[a]	8.98 (1.50)[a]	7.31 (2.14)
Aging anxiety				
Time 1	3.51 (1.21)	3.63 (1.15)	3.63 (1.25)	3.84 (1.13)
Time 2	3.69 (1.15)	3.68 (1.09)	3.69 (1.12)	3.90 (1.11)
Anxiety interacting				
Time 1	2.13 (0.99)	2.17 (1.05)	2.27 (1.11)	2.32 (1.07)
Time 2	2.16 (1.05)	2.13 (0.97)	2.32 (1.15)	2.30 (1.07)
Behavioral intentions				
Time 1	4.79 (0.88)	4.81 (0.87)	4.79 (0.81)	4.65 (0.82)
Time 2	4.80 (0.88)	4.76 (0.85)	4.74 (0.88)	4.72 (0.89)

[a]Refers to contrast 1 (all three experimental conditions being significantly different than the control condition).

for gender and quality/quantity of contact with older adults. Separate ANCOVAs revealed a significant effect for aging knowledge, $F(3, 493) = 28.20$, $p < .001$, $\eta^2 = .15$. There were no significant effects for the ageism measure ($F[3, 493] = 1.29$, $p = .28$, $\eta^2 = .008$), PAS ($F[3, 493] = 1.28$, $p = .28$, $\eta^2 = .008$), NAS ($F < 1$), aging anxiety, ($F < 1$), behavioral intentions ($F < 1$), and anxiety about interacting with older adults ($F < 1$).

As in Study 1, for aging knowledge, experimental condition participants reported significantly greater aging knowledge compared to control condition participants, $t(505) = 9.08$, $p < .001$, $d = 0.85$. There were no significant differences comparing the combined and education conditions, $t(249) = 0.23$, $p = .88$ or the combined and extended contact conditions, $t(252) = 1.32$, $p = .45$.

General Discussion

Ageism is pervasive in the United States, making it an urgent social issue. The present investigation tested the PEACE model (Levy, 2016) for the first time. Two experimental studies examined two key factors for reducing ageism: education about aging and positive contact experiences with older adults, as well as a third combined approach. In both studies, all three experimental conditions (compared to a control condition) reported less negative attitudes toward older adults and greater aging knowledge. These findings are important given that our studies used a brief, online presentation to combat the prevalence of ageism in everyday culture. Additionally, the current studies included important methodological features (random assignment, control groups, and the inclusion of both students and a community sample) not uniformly present in past research.

Some of the effects of the experimental conditions (compared to control) were apparent only in the immediate post-test such as increased endorsement of positive age stereotypes (Studies 1 and 2), decreased endorsement of negative age stereotypes (Study 1), and less negative attitudes (Study 2). Thus, our findings likely underscore the difficulty of challenging ageism in a youth-centered culture (Nelson, 2009; Ng et al., 2015). Additionally, across studies, there were no behavioral effects (variability was low) although this nonsignificant finding has precedence in the literature (Ramsey, Mendoza, & Weil, 2014). Future research is needed to understand whether the lack of significant differences on the behavioral and affective measures were due to the specific behaviors (e.g., giving money, helping older adults) and emotions (e.g., feeling thermometer) measured and/or the aspects of the ageism-reduction strategies included in this investigation (e.g., length, online nature, content).

Implications

Given the theoretical foundation of our studies (PEACE model and past relevant empirical research), our findings

have implications for future ageism reduction interventions. First, all three experimental conditions converge on the same key mechanism—challenging inaccurate information about older adults—as a way to reduce ageism. Reducing negative attitudes and increasing aging knowledge during a brief online study provides promise that lengthier versions of our conditions could bring about greater and longer-lasting attitudinal change as well as behavioral and affective changes. Future in-depth tests of the PEACE model could vary whether multiple in-person and/or online sessions are used and could challenge inaccurate information about older adults through coursework or seminars, videos, and/or intergenerational contact.

Second, these findings contribute to the literature showing that providing aging education lowers ageism (McCleary, 2014; Wurtele & Maruyama, 2013). The current findings help address past mixed results which included some studies with methodological weaknesses (lack of random assignment, control groups, restricted samples). Third, these experiments demonstrate, for the first time, that depictions of positive intergenerational extended contact reduce ageism, which aligns with findings from the broader experimental extended contact literature (Cameron et al., 2011). Extended contact can be a first step in improving attitudes toward older adults, especially when few in-person contact opportunities exist, and can set the stage for positive in-person contact (Drury et al., 2016). Drury et al. (2016) noted that "direct contact with older adults may not be necessary to reduce ageism in young people: simply knowing that other young people have positive relationships with older individuals may be sufficient to achieve this aim" (p. 529).

Fourth, the inclusion of a combined condition is a unique extension of prior research. Although an exploratory hypothesis, the combined condition was not more effective than either education or extended contact conditions. To provide similar experiences for all participants, each condition were similar lengths such that the combined condition was an abridged version of both education and extended contact conditions. Future research should examine whether a full-length combined condition has a more powerful impact on ageism.

Fifth, the online nature of this research, as advocated by experts (Chonody, 2015), allows for easier access to large samples of individuals with internet access, which seems especially important given the lack of aging education in U.S. schools and concerns about limited positive intergenerational contact. Although our samples were not homogenous with respect to race/ethnicity, we did not have enough statistical power to explore possible differences among these groups, which is an important future direction given little research on this topic (Levy & Macdonald, 2016).

To conclude, across two online studies involving undergraduates and age-diverse community adults, education about aging and knowledge of intergenerational extended contact improved attitudes toward older adults and aging knowledge. Online ageism-reduction strategies could be implemented on a wide scale to reduce ageism that is harmful toward older adults and society as a whole.

Conflict of Interest

None reported.

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