

## Research Article

# Age Differences in Explicit and Implicit Age Attitudes Across the Life Span

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## Abstract

**Purpose of the Study:** Biased judgments about others can operate both within and outside of our conscious awareness. However, little attention has been paid to how implicit and explicit attitudes differ across the life span, particularly with respect to age bias. In the current study, we examined age differences in implicit and explicit attitudes towards older individuals.

**Design and Method:** Participants ( $N = 704,151$ ) ranging from age 15 to 94 completed the Implicit Association Test and explicit self-report measures of bias against older adults. The associations between age bias and several demographic characteristics (e.g., gender, education) were also examined.

**Results:** A preference for younger people was found among participants of all ages; however, implicit and explicit attitudes showed divergent associations with age. Implicit preference for younger people was highest among older adults; explicit preference for younger people was lowest among older adults.

**Implications:** Examining age differences in implicit and explicit attitudes sheds light into the development and complexities of aging perceptions in different age groups. The current study's findings are discussed in the context of applications to and implications of reducing prejudice toward older adults.

**Keywords:** Implicit association task, Explicit attitudes, Ageism, Project implicit, Age differences

Age bias against older adults is pervasive in society and is quite detrimental for individuals' health and well-being in late adulthood. Substantial research has focused on the effects of others' ageism on older adults, particularly with respect to the care they receive in the medical system and their interactions in the workplace (Adelman, Greene, & Ory, 2000; Greene, Adelman, Charon, & Hoffman, 1986; Higashi, Tillack, Steinman, Harper, & Johnston, 2012; North & Fiske, 2015a). There is also evidence that an individual's own attitudes toward aging can have important implications for health and well-being. Negative attitudes towards aging and negative stereotypes about old age are associated with memory impairments (Barber & Mather,

2013; Levy, Zonderman, Slade, & Ferrucci, 2012), markers of Alzheimer's disease (Levy et al., 2016), slower recovery from disability (Levy, Slade, Murphy, & Gill, 2012), poor health behavior and physical functioning (e.g., Levy & Myers, 2004), and worse cardiovascular health (Levy, Zonderman, Slade, & Ferrucci, 2009). Unlike other stigmatized identities and social categories (e.g., race, gender, sexual orientation), aging is dynamic process; individuals move from one category to another as they live—from young adulthood, to middle adulthood, to older adulthood. People of different ages likely encounter new information and experiences that revise their attitudes towards older adults and aging (Levy, 2009). Despite this, there

is little research documenting age differences in implicit and explicit attitudes toward older and younger adults. The current study seeks to address this gap by examining cross-sectional age differences in implicit and explicit attitudes towards older and younger adults in a sample of over 700,000 people ranging in age from 15 to 94.

Research on the association between implicit and explicit attitudes towards stigmatized groups is ubiquitous and has a long history, particularly in the field of social psychology (e.g., Greenwald, Poehlman, Uhlmann, & Banaji, 2009). The distinction between *explicit* and *implicit* attitudes is made to highlight the unique predictive validity of evaluative cognitions to which we have conscious access (explicit attitudes) and automatic evaluative associations we make that are outside of our conscious awareness (implicit attitudes). Explicit attitudes are often measured with self-report instruments; implicit attitudes are often measured with the Implicit Association Test (IAT), an instrument designed to assess the implicit association between two concepts using response latencies (Greenwald, McGhee, & Schwartz, 1998).

Why might implicit and explicit attitudes be different among younger versus older adults? The mechanisms that are hypothesized to give rise to differences in prejudice are all likely to unfold across the life span (Lai, Hoffman, & Nosek, 2013). For example, interacting more with outgroup members facilitates reduction in prejudice through exposure to counter-stereotypical examples which can potentially lead us to revise the automatic associations we hold about other people (e.g., Dasgupta & Rivera, 2008). From a very young age, negative stereotypes about older adults are communicated to us, becoming deeply ingrained and persistent (Bigler & Liben, 2007; Levy & Banaji, 2002). With more life experience, we encounter counter-stereotypical information that often violates these initial thoughts. Counter-stereotypical information might originate from the interactions we have with older family members and friends—which may contradict societal messages about what it means to be an older adult. This information might also originate within us. As people experience the aging process, they reflect on their place in society and their everyday behavior, and they revise their beliefs about themselves (Caspi & Roberts, 1999). Also, as people assume different social categories (e.g., becoming an older adult), they likely start to identify with this new social group and revise their attitudes to be more positive toward their ingroup, now that they have this new perspective on life (Galinsky & Moskowitz, 2000; Tajfel & Turner, 1986). As such, ageist attitudes may be more present among younger people and less present among older adults, who have many experiences interacting with older adults, both over the course of the lives and in their current everyday life (e.g., Allport, 1954).

Some research finds few or no age differences in implicit preferences for young adults compared to older adults (Axt, Ebersole, & Nosek, 2014; Nosek, Banaji, & Greenwald, 2002; Nosek et al., 2007). Likewise, younger and older adults process the emotions and phenotypic characteristics

of people of all ages equally well (Ebner, 2008). Other studies are more ambiguous, finding that older adults have the highest implicit preference for younger adults or no age differences, depending on how the data are analyzed (Hummert, Garstka, O'Brien, Greenwald, & Mellott, 2002). Unfortunately, previous work is limited in several aspects. First, previous investigations have tested only linear effects of age, which may mask more complicated curvilinear trends (Chopik, Kim, & Smith, 2015). Second, many look at a restricted age range, particularly among older adults (e.g., participants over the age of 60 are often excluded or collapsed into younger cohorts; Axt et al., 2014). Third, other studies make extreme age group comparisons and rely on small sample sizes (e.g., Hummert et al., 2002), which increase the likelihood of false positives while neglecting the differences that may be present across a wide variety of ages (Cohen, 1983; Freund & Isaacowitz, 2013; Simmons, Nelson, & Simonsohn, 2011). Conceptually, we expected implicit preferences for younger adults to be greatest in older adulthood given previous experimental and correlational research (Hummert et al., 2002; Weiss & Lang, 2012) and given that these internalized preferences may accumulate over years of exposure to ageist stereotypes (Levy, 2009).

Across many studies, younger adults show an explicit preference for younger adults and older adults show an explicit preference for older adults (Kornadt, Voss, & Rothermund, *in press*; Nosek et al., 2002; Nosek et al., 2007). The observation that people have explicit preferences for their own ingroup is at the heart of many classical theories of social identity (Abrams & Hogg, 1990; Tajfel & Turner, 1986). However, as a person ages, they realize that it is not socially acceptable to express an explicit preference against a stigmatized group, like older adults (Sritharan & Gawronski, 2010). Thus, we hypothesized that younger adults would have an explicit preference for younger adults and older adults would have an explicit preference for older adults or no preference. Drawing on the tenets of ingroup preference and social identity, we also hypothesized that older adults would report fewer spontaneous prejudiced thoughts toward older adults and a greater desire to be non-prejudiced toward older adults.

## The Current Study

The current study examined implicit and explicit attitudes towards older and younger adults in a large cross-sectional sample of adults age 15 through 94. We examined implicit attitudes via the IAT. We examined explicit attitudes with a series of items tapping into explicit preference for younger people compared to older people, whether participants report having spontaneous prejudiced thoughts about older adults, their desire to *appear non-prejudiced* toward older adults, and their desire to *be non-prejudiced* toward older adults. We predicted that older adults would have the highest implicit preferences for younger people; we also predicted that older adults would have the most positive explicit attitudes toward older adults. Because researchers who study explicit and

implicit age attitudes rarely examine nonlinear trends, we modeled these patterns for each outcome but had no specific hypotheses about which exact estimates would be significant, other than specifying the aforementioned pattern. Because men and higher socioeconomic groups often display higher rates of bias (Nosek et al., 2007), we expected men to be higher in both implicit and explicit bias; we also hypothesized that highly educated groups to report higher explicit bias. Finally, we hypothesized that highly educated groups would conversely have lower levels of implicit bias, which is also consistent with previous research (Nosek et al., 2007).

The current study is the largest to date to examine age differences in implicit and explicit attitudes. Because of the wide age range (ages 15–94), we are able to quantify the magnitude of age differences from adolescence to late life for the first time. Previous research has been limited by small sample sizes, extreme group comparison, and a limited conceptualization of attitudes toward older adults. We address these gaps in the current study.

## Method

### Participants and Procedure

Participants were drawn from a large sample of participants ( $N = 817,942$ ) from the Project Implicit Demo Site (<https://osf.io/y9hiq/>), a website that hosts studies on the IAT. Data were collected from December 2002 to December 2015. From this larger sample, 113,791 were excluded from the present analyses because these participants were younger than 15, 95 years and older, or had missing data on age ( $N = 99,450$ ; 12.2% of the original sample), had an error rate greater than 30% across all trials ( $N = 2,115$ ; 0.3%), or had an error rate above 40% on any individual block and a latency of 440 ms or more on fewer than 10% of IAT trials ( $N = 12,225$ ; 1.5%), which are consistent with previous exclusionary criteria using the IAT (Greenwald, Nosek, & Banaji, 2003; Nosek et al., 2007; Westgate, Riskind, & Nosek, 2015). No other exclusions were made. A number of users (37.4%) reported having previously taken at least one IAT. Number of IATs taken was associated with lower implicit preference for younger adults,  $\beta = -.18$ ,  $p < .001$ , but was largely unrelated to other measures of bias and demographic variables ( $r_s < |.03|$ ). The inclusion of number of IATs taken as a covariate in the analyses reported below did not substantively change the results or magnitude of effects.

The final analytic sample comprised of 704,151 individuals (67.4% Female). The overall sample ranged in age from 15 to 94 ( $M = 27.76$  years,  $SD = 2.27$  years); the median level of education was some college. Self-reported race/ethnicity was 71.3% Caucasian, 8.4% Hispanic, 6.9% Asian, 6.8% African American, and 6.6% Mixed/Other ethnicities. Despite the sample being relatively young, each decade of life was well represented (e.g., 15–19 years: 205,769; 20–29 years: 280,634; 30–39 years: 92,335; 40–49 years: 63,681; 50–59 years: 45,317; 60–69 years: 13,853; 70+ years: 2,562). The majority of respondents were from the

United States (77.3%); the survey and IAT stimuli were presented entirely in English. Other language information from the participants was unavailable. Studies evaluating the accuracy and replicability of basic psychological paradigms administered online suggest that online data collection is a useful and valid tool for collecting psychological and demographic data (Gosling, Vazire, Srivastava, & John, 2004). The validity of using IAT data collected online to examine questions of prejudice has been widely shown and is discussed elsewhere (Nosek et al., 2002; Nosek et al., 2007).

### Implicit Preferences for Young People Compared to Old People

The IAT is a reaction time task used to measure the strength of associations between two pairs of concepts and has been used extensively in past research to quantify implicit prejudice (Greenwald et al., 1998; Greenwald et al., 2003). Participants respond to pairings of face stimuli (i.e., young and old faces) with positively or negatively valenced words (e.g., “Fantastic” and “Nasty”). The underlying assumption is that the more closely related a concept (e.g., a young face) with an evaluation (e.g., “happy”), the faster and easier participants are to associate that concept and evaluation. Participants were instructed to pair both young stimuli with positive items (and old stimuli with negative items) in one session and old stimuli with positive items (and young stimuli with negative items) in another session. Specifically, the average response latencies in categorizing stimuli are compared between two conditions: *Young faces* and *Good* items are categorized with one response key and *Old faces* and *Bad* items are categorized with another (Condition 1); or *Young faces* and *Bad* items are categorized with one response key and *Old faces* and *Good* items are categorized with another (Condition 2). Participants who categorize items faster in Condition 1 compared to how fast they categorize items in Condition 2 are considered to have an implicit preference for young people compared to old people (Greenwald et al., 2003; Westgate et al., 2015).

The IAT followed the standardized 7-block format; order of the two category pairings were randomized as was the response key (“e” or “i” on a keyboard) for representing good and bad items. Target stimuli of young and old people were close-up images of younger and older adults. We computed implicit preference scores using the *D* algorithm, which has been shown to be the most reliable estimate of implicit preferences, more so than alternative transformations (Greenwald et al., 2003).

### Explicit Preferences for Young People Compared to Old People

From 2002 until September 2006, explicit attitudes were measured with a single item on 5-point scale ranging from 1 (*I strongly prefer Old People to Young people*) to 5 (*I strongly prefer Young People to Old People*). This item (and

similar versions of it) has been used to measure explicit attitudes towards stigmatized groups (Nosek et al., 2002). A midpoint (3) was also provided (*I like Young People and Old People equally*). After September 2006, the scale changed to a 7-point scale with the same anchors and midpoint. To consolidate the scales, the 7-point scale was recoded into a 5-point scale (scale choices 2 and 3 were combined; scale choices 5 and 6 were combined). An alternative approach of using *z*-scores yielded identical results to those reported below. The mean of the consolidated explicit attitudes measure was above the midpoint, suggesting an explicit preference for young people compared to old people.

### Attitudes About Prejudice Toward Older Adults

A series of items assessing acknowledgment that people have prejudiced feelings, social consciousness about ageist attitudes, and valuing equality between young and old people were provided to a subset of participants ( $N = 212,855$ ). Participants responded to each of the questions below on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

#### Acknowledgment

Two items assessed an acknowledgment that people sometimes have prejudiced feelings that are uncontrollable: "Although I don't necessarily agree with them, I sometimes have prejudiced feelings (like gut reactions or spontaneous thoughts) that I don't feel I can prevent," and "NO spontaneous prejudiced thoughts come to my mind when I encounter an unfamiliar old person." Responses were coded such that higher values indicated greater acknowledgment; the two items were averaged together (Cronbach's  $\alpha = .57$ ).

#### Social Consciousness

Two items assessed the degree to which participants tried to appear non-prejudiced toward older adults to avoid disapproval from others: "Because of today's standards I try to appear non-prejudiced toward old people," and "I attempt to appear non-prejudiced towards old people in order to avoid disapproval from others." Responses were coded such that higher values indicated greater social consciousness about ageism; the two items were averaged together (Cronbach's  $\alpha = .57$ ).

#### Valuing Equality

Two items assessed participants' desire to be non-prejudiced towards older adults and that using stereotypes is wrong: "I am personally motivated by my beliefs to be non-prejudiced towards old people," and "Because of my personal values, I believe that using stereotypes about old people is wrong." Responses were coded such that higher values indicated greater valuing of equality; the two items were averaged together (Cronbach's  $\alpha = .59$ ).

### Analytic Approach

Because of our large sample, there was a concern that many effects would likely be statistically significant despite being practically meaningless. To address this, we employed an effect size-based approach to interpret our effects (Chopik & Edelstein, 2014; Srivastava, John, Gosling, & Potter, 2003). As in this previous research, we limited our discussion to individual effects that exceeded a certain threshold that was deemed meaningful when using large samples ( $\Delta R^2 > .001$  and  $F_{\text{change}} > 25$ ). Further, prior research suggested that the most complex age trends that can be meaningfully interpreted involve cubic patterns (Terracciano, McCrae, Brant, & Costa, 2005). Thus, we tested the linear (age), quadratic (age<sup>2</sup>), and cubic (age<sup>3</sup>) effects of age; we did not test for more complex models. Age was centered prior to computing these higher order terms in order to reduce multi-collinearity and to yield an interpretable intercept estimate in each model. We initially tested incremental models (i.e., predicting attitudes from an individual age term, before adding a more complex pattern) before realizing that in nearly every case, the inclusion of age<sup>2</sup> and age<sup>3</sup> surpassed our effect size threshold. We report the full models for simplicity with individual  $F_{\text{changes}}$  for each estimate, but the information for the sequential model testing analysis can be requested from the first author.

For analyses involving implicit measures, we controlled for procedural variables of the IAT, specifically the order of stimuli, whether good items were categorized on the right or left side of the screen, and whether younger or older faces were categorized on the right or left side of the screen.

Because the current study is cross-sectional, we cannot make any definitive statements as to whether our results originate from developmental changes in attitudes or reflect generational or cohort shifts in attitudes. Thus, in the sections below, we are agnostic to the cause of these differences and report only group differences. This is a limitation of the current work and is further explored in the Discussion.

## Results

### Preliminary Results

Correlations and study descriptives are presented in Table 1. Implicit and explicit preferences were weakly (positively) correlated, and the magnitude of this correlation was relatively constant across the life span,  $\beta = .007$ ,  $p < .001$ ,  $\Delta R^2 = .00005$ . Implicit preferences for younger adults (compared to older adults) were weakly correlated with explicit measures of acknowledging prejudiced thoughts, a desire to be seen as non-prejudiced (i.e., social consciousness), and valuing equality between younger and older adults, so weakly that they could be considered largely unrelated. Explicit preferences for younger adults were correlated with other explicit measures in the same directions as implicit attitudes but at slightly higher magnitudes, albeit still weakly. Acknowledging prejudiced

thoughts demonstrated a small positive correlation with social consciousness and a small negative correlation with valuing equality. Finally, social consciousness was negatively associated with valuing equality.

### Regression Analyses

We hypothesized that implicit preferences for younger adults would be highest among older adults compared to younger adults. The regression results predicting implicit preferences for younger adults (compared to older adults) are presented in the top panel of Table 2. The linear, quadratic, and cubic effects of age were each significant. As seen in Figure 1a, older adults reported the highest preference for younger adults compared to older adults; younger adults reported lower implicit preference for younger adults compared to older adults, consistent with our hypothesis. There were few differences among middle-aged adults. Women and participants with more education had lower implicit preference for younger adults, also confirming our hypotheses.

We also hypothesized that explicit preferences for younger adults would be higher among younger adults

relative to older adults. The regression results predicting explicit preferences for younger adults (compared to older adults) are presented in the bottom panel of Table 2. The linear, quadratic, and cubic effects of age were each significant. As seen in Figure 1b, younger adults had the highest explicit preference for younger adults; older adults had the lowest explicit preference for younger adults. The largest age differences were between young adults and middle-aged adults. Women had lower explicit preference for younger adults; participants with more education had higher explicit preference for younger adults, also confirming our hypotheses.

Regression results predicting attitudes about prejudice toward older adults are presented in Table 3 (upper panel: acknowledgment of prejudiced feelings; middle panel: social consciousness; lower panel: valuing equality). As seen in Figure 2a, the acknowledgment of prejudiced thoughts about older adults was lowest among older adults and highest among younger adults, consistent with our hypothesis. Women were less likely to acknowledge that they have prejudiced thoughts. For social consciousness, the linear, quadratic, and cubic effects of age were

**Table 1.** Correlations Between Main Study Variables

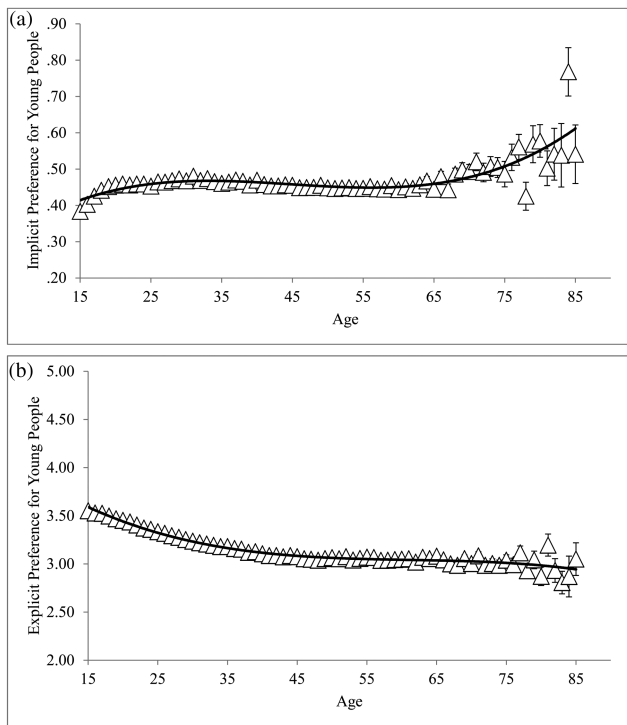
	1	2	3	4	M	SD
1) Implicit attitudes					.45	.39
2) Explicit attitudes	.13				3.34	.78
3) Acknowledgment	.08	.23			4.39	1.50
4) Social consciousness	.07	.20	.19		4.07	1.56
5) Value equality	-.04	-.18	-.16	.14	5.75	1.23

Note: Ns range from 203,346 to 657,984. All correlations significant at  $p < .001$ .

**Table 2.** Regression Analyses Predicting Implicit and Explicit Preferences for Younger People Compared to Older People

Regression term	<i>b</i>	<i>SE</i>	$\beta$	<i>t</i>	<i>p</i>	<i>F</i> <sub>change</sub>	$\Delta R^2$
<b>Implicit attitudes</b>							
Constant	.41	.003					
Age	.002	.0001	.06	26.09	<.001	680.44	.001
Age <sup>2</sup>	-.0002	.00001	-.16	-32.88	<.001	1081.13	.002
Age <sup>3</sup>	.000004	.0000002	.12	27.27	<.001	743.62	.001
Gender	-.04	.001	-.11	-87.55	<.001	7664.15	.01
Education	-.005	.0003	-.03	-19.60	<.001	384.34	.001
Order	.05	.001	.07	51.98	<.001	2701.88	.004
Side (young/old)	-.01	.001	-.02	-12.68	<.001	160.66	.0002
Side (good/bad)	.04	.001	.05	39.55	<.001	1564.50	.002
<b>Explicit attitudes</b>							
Constant	3.14	.004					
Age	-.02	.0001	-.35	-153.49	<.001	23560.07	.03
Age <sup>2</sup>	.001	.00001	.24	52.02	<.001	2706.21	.004
Age <sup>3</sup>	-.00001	.0000003	-.11	-24.70	<.001	610.28	.001
Gender	-.10	.001	-.12	-98.28	<.001	9659.25	.01
Education	.02	.001	.07	46.60	<.001	2171.60	.003

Note: Equation for implicit attitudes:  $F(8, 670,644) = 1,636.09, p < .001, R = .14$ . Equation for explicit attitudes:  $F(5, 656,253) = 8,749.75, p < .001, R = .25$ .



**Figure 1.** (a) Age differences in implicit and (b) explicit preferences for younger adults compared to older adults. Ages over 85 were collapsed due to low sample sizes at each advanced age ( $N < 20$ ). Analyses reported in text were run on all data. The Y-axis represents mean values on the dependent variable of interest and triangles represent the mean at each age; line of best fit is plotted (Table 2). Error bars represent  $\pm 1$  SE around the mean for each age.

significant and surpassed our effect size criteria. As seen in Figure 2b, younger adults were the most socially conscious about trying not to appear prejudiced toward older adults. Middle-aged adults were lower in social consciousness than both younger and older adults. For valuing equality, only the linear effect of age surpassed our effect size criteria and was retained for the final model. Older adults were highest in valuing equality between younger and older adults. Middle-aged and younger adults were lower in valuing equality than their older counterparts.

### Discussion

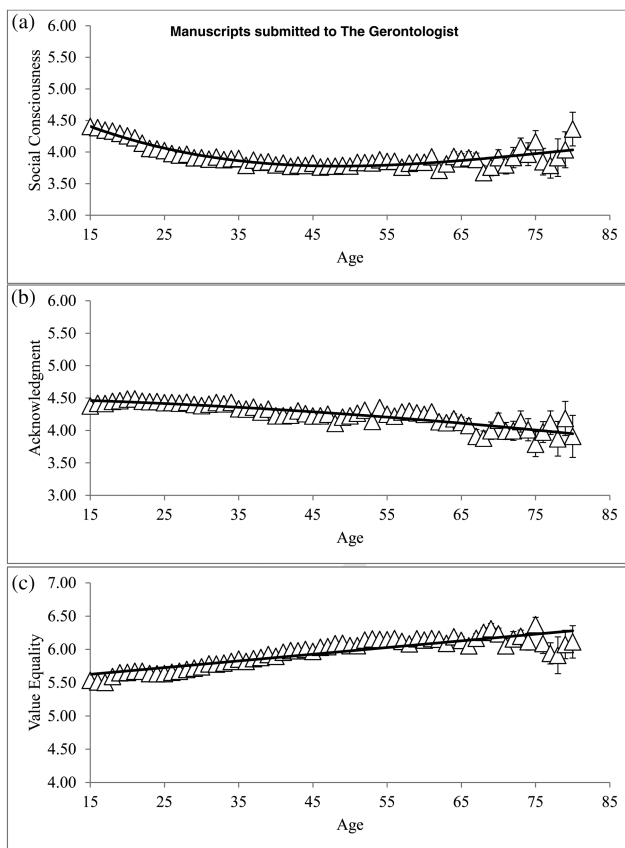
The explicit positive attitudes towards older adults among middle aged and older adults are consistent with existing research on social identity and how social contact can reduce prejudice toward stigmatized groups (Galinsky & Moskowitz, 2000; Lai et al., 2013; Nosek et al., 2007; Tajfel & Turner, 1986). As individuals interact more with older adults, they meet counter-stereotypical exemplars that lead them to challenge the negative associations they have about older adults. Likewise, as individuals age and become older adults themselves, they may revise their explicit attitudes toward older and younger adults as they become members of different social groups across the life span.

The fact that implicit preferences for young people were highest among the oldest participants can be predicted from multiple theoretical perspectives. When stigmatized outgroups are made salient, people engage in

**Table 3.** Regression Analyses Predicting Attitudes About Prejudice Toward Older Adults

Regression term	<i>b</i>	SE	$\beta$	<i>t</i>	<i>p</i>	<i>F</i> <sub>change</sub>	$\Delta R^2$
<b>Acknowledgment</b>							
Constant	3.95	.01					
Age	-.02	.0005	-.14	-33.94	<.001	1151.78	.005
Age <sup>2</sup>	.001	.00005	.10	11.08	<.001	112.83	.001
Age <sup>3</sup>	-.00001	.000001	-.06	-7.41	<.001	54.87	.0003
Gender	-.09	.003	-.06	-25.52	<.001	651.32	.003
Education	.07	.002	.11	38.69	<.001	1472.10	.007
<b>Social consciousness</b>							
Constant	3.86	.01					
Age	-.03	.001	-.21	-51.26	<.001	2627.37	.01
Age <sup>2</sup>	.001	.00005	.19	22.47	<.001	505.07	.002
Age <sup>3</sup>	-.00001	.000001	-.08	-10.41	<.001	108.26	.001
Gender	.03	.004	.02	7.26	<.001	52.68	.0003
Education	.02	.002	.02	8.08	<.001	65.36	.0003
<b>Value equality</b>							
Constant	5.65	.01					
Age	.02	.0002	.15	61.07	<.001	3729.55	.02
Gender	.22	.003	.17	80.56	<.001	6489.74	.03
Education	.003	.001	.01	2.35	.02	5.53	.00003

Note: Equation for acknowledgment:  $F(5, 206, 606) = 585.21, p < .001, R = .12$ . Equation for social conscience:  $F(5, 206, 820) = 767.53, p < .001, R = .14$ . Equation for value equality:  $F(3, 206, 795) = 3689.15, p < .001, R = .23$ . The cubic and quadratic effects of age on valuing equality did not surpass our effect size threshold ( $F_{\text{changes}} < 5.70$ ) so they are not included in the model.



**Figure 2.** Age differences in acknowledgment of (a) prejudicial thoughts, (b) social consciousness, and (c) valuing equality between older and younger adults. Ages over 85 were collapsed due to low sample sizes at each advanced age ( $N < 20$ ). Analyses reported in text were run on all data. The Y-axis represents mean values on the dependent variable of interest and triangles represent the mean at each age; line of best fit is plotted (Table 3). Error bars represent  $\pm 1 SE$  around the mean for each age.

avoidance-oriented behavior which is often initiated through implicit and automatic responses (Paladino & Castelli, 2008). As a result, individuals are motivated to create psychological and physical distance between themselves and outgroup members (e.g., Cesario, Plaks, Hagiwara, Navarrete, & Higgins, 2010). When people become older adults, they could view themselves as becoming part of a group to which they have held negative implicit attitudes towards their whole life. In an effort to distance themselves from this negative outgroup, their implicit attitudes towards older adults might become more negative. The increased preference for younger adults over older adults is one of the reasons why older adults often oppose funding programs that would immediately benefit themselves (e.g., Social Security, Meals on Wheels, Medicare; Levy & Schlesinger, 2005). These policy preferences were most evident among older adults who subscribed to negative stereotypes about aging. Perhaps the strongest evidence comes from the phenomenon of age-group dissociation among older adults (Weiss & Lang, 2012). In their study, Weiss and Lang found that when negative age stereotypes were made salient, older adults often dissociated themselves

from their own age group by being less likely to endorse questions like “I identify with people my age” and “I am glad to belong to people my age.” Thus, the higher preference for younger adults among the oldest old might stem from this distancing process.

## Applications and Opportunities for Interventions

Given these observed age differences and the large literature on the negative effects of age bias on older adults (e.g., Levy, 2009; Levy, Slade, et al., 2012), a natural question is, what can be done to reduce prejudice toward older adults? One potential difficulty in addressing this question is that implicit bias is particularly insidious because it is deeply ingrained early in life and may be more resistant to change than explicit bias (Bigler & Liben, 2007; Levy & Banaji, 2002). Nevertheless, efforts to reduce implicit bias have received considerable attention over the past few years (Forscher et al., 2016; Lai et al., 2014; Lai et al., 2016). The preponderance of evidence from these efforts suggest that interventions on the individual level are only effective in the immediate aftermath and may not always lead to persistent change in explicit actions. Surprisingly, much evidence for reducing negative age stereotypes and bias comes from broader, more comprehensive programs. Many of these include making positive older exemplars more accessible and visible (Levy & Banaji, 2002) and monitoring language to avoid infantilizing older adults (Hummert, Garstka, Ryan, & Bonnsen, 2004). Another promising avenue is to increase intergroup contact between younger and older adults through involvement in broader community programs at local and state levels (Braithwaite, 2002; Christian, Turner, Holt, Larkin, & Cotler, 2014). The initiation of many of these programs—intergenerational daycare, education, volunteer, and recreation—are relatively easy to create and monitor and likely serve unmet needs for many communities. These programs also provide opportunities for different forms of intergenerational contact—both direct and indirect—that are hypothesized to reduce prejudice toward older adults (see Christian et al., 2014, for a review).

## Limitations

Because of our cross-sectional design, we cannot discern whether the age differences observed in the current study reflect developmental changes across the life span or cohort differences in attitudes among older adults, which might be changing over historical time (Westgate et al., 2015). One strong consideration for future work is to examine changes in attitudes over larger stretches of time and develop more intensive interventions to improve attitudes towards older adults and aging.

The current study utilized the largest sample to date to examine age differences in implicit and explicit attitudes. However, large sample sizes may yield findings that are statistically significant but of little practical significance (Cohen, 1990). Further, these cross-sectional findings

underscore the importance of looking at intra-individual changes in attitudes across the life span, which can actually be quite large. Linking both the antecedents and outcomes of individual differences in attitudes change is an important future direction.

Finally, the data from the current study were drawn from an online website in which people voluntarily elected to complete measures of implicit and explicit bias. Thus, our sample is a nonrepresentative one and may differ from the general population in several ways, particularly our sample of older adults. Future studies should examine these questions in nationally representative surveys and experiments to allow for greater generalizability of our findings.

## Conclusion

Our study is one of the first to examine age differences in implicit and explicit attitudes towards older adults on such a large scale. We found that it is worthwhile to distinguish between implicit and explicit attitudes—they show different associations with age. Given the implications of ageist attitudes, for both the societies and individuals that hold them, examining ways in which ageist attitudes can be reduced has the potential to create a more inclusive society for individuals of all ages (North & Fiske, 2015b).

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