

Cross-Cultural Comparisons in Implicit and Explicit Age Bias

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Abstract

Most research documenting bias against older adults has been conducted in individualistic and industrialized cultures. In the current study, we examined cultural variation in attitudes toward older adults and subjective age in a large sample of 911,982 participants ($M_{\text{age}} = 27.42$, $SD = 12.23$; 67.6% women) from 68 different countries ($M_{\text{size}} = 12,077$; $Mdn_{\text{size}} = 425.5$). We hypothesized that age bias would be lower among those living in highly collectivistic countries. We found that living in collectivistic countries was associated with less implicit and explicit age bias, and greater feelings of warmth toward older adults compared with highly individualistic countries. Given the impact of age bias and prejudice on both the targets and perpetrators of bias, further research is needed to examine the causes of and interventions for bias against older adults.

Keywords

explicit bias, implicit bias, cultural differences, individualism/collectivism, age bias

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There is a documented pattern of bias and prejudice held against older adults in modern society. A great deal of past research has focused on the antecedents and consequences of holding this bias—for both individuals and society (e.g., North & Fiske, 2015a). However, work on age bias to date has been conducted primarily in Western, largely individualistic, and developed cultures. In the current study, we examined cultural variation in attitudes toward older adults and subjective age in a sample of more than 911,000 participants from an expanded set of 68 different countries.

Bias Against Older Adults

Various studies have found that age prejudice has a negative impact on older adults in a variety of domains, including in the medical care they receive, their experiences in the workplace, and their mental functioning (e.g., Avolio & Barrett, 1987; Barakat et al., 1999; Barber & Mather, 2013; Kagan & Melendez-Torres, 2015; Kaufmann et al., 2017; Rupp et al., 2006). Furthermore, those who hold biases against older adults are also affected negatively by their own biases—primarily as it relates to health and well-being (Levy et al., 2009, 2016; Levy & Myers, 2004; Levy, Slade, et al., 2012; Levy, Zonderman, et al., 2012).

This age bias can occur at multiple levels—both implicitly and explicitly. The relationship between implicit and explicit bias has been the subject of much empirical work in social psychology (Greenwald & Banaji, 1995). According to Greenwald and Banaji (1995), implicit biases are “the introspectively unidentified (or inaccurately identified)

traces of past experience that mediate attributions of qualities to members of a social category” (p. 15). That is, an implicit bias is a collection of attitudes that the holder is not consciously aware of having. Explicit bias is a collection of attitudes that the holder is aware of having and is able to express consciously. Explicit bias is typically assessed via a self-report measure such as a survey, whereas implicit bias is often studied via an implicit association test (IAT). The IAT measures implicit bias by recording response times in decisions in which people pair two concepts—response latency indicates implicit bias (Greenwald et al., 1998). Based on both explicit and implicit operationalizations of bias, people generally hold more negative biases toward older adults (Chopik & Giasson, 2017; Jelenec & Steffens, 2002; Levy & Banaji, 2002).

Another way of measuring people’s perception of older adults and older adulthood is through the age they report “feeling” (i.e., their subjective age). The literature on subjective age is quite large and has implicated individual’s health, well-being, and workplace behavior (Galambos et al., 2005; Hess et al., 2017; Kotter-Grühn et al., 2016; Mock & Eibach, 2011; Montepare, 2009; Nagy, Fasbender, & North, 2019; Nagy, Johnston, & Hirschi, 2019; Rioux & Mokoukolo, 2013; Wang & Shi, 2016; Weiss & Freund, 2012; Weiss &

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Kornadt, 2018; Zacher & Rudolph, 2019). An individual's subjective age likely arises from many sources, including how they physically feel, what they think about themselves, and what they think about older adulthood (Montepare, 2009; Montepare & Lachman, 1989). Although reporting feeling younger than one's chronological age is associated with a number of positive outcomes (e.g., living longer, job crafting, and work meaningfulness), there is a growing recognition that the antecedents of a younger subjective age might be rooted in people's perceptions of what it means to be an older adult. For example, people prefer to dissociate themselves from groups that are stigmatized, which is provided as one of the explanations for why people reliably report a younger subjective age than their chronological age (Chopik et al., 2018; Kleinspehn-Ammerlahn et al., 2008; Kotter-Grühn et al., 2009; Weiss & Kornadt, 2018; Weiss & Lang, 2012). Even older adults distance themselves from their own age group when presented with negative stereotypes about older adults (Kotter-Grühn & Hess, 2012; Weiss & Kornadt, 2018). This is especially true among individuals living in particularly hostile environments for older adults—older adults living in particularly ageist environments tend to report younger subjective ages on average compared with older adults living in age-friendly environments (Giasson & Chopik, 2020).

Subjective age can also be conceptualized as a marker of attitudes toward older adults, as it directly implicates the distancing processes that bring about age group identification, despite its ostensibly positive consequences (Giasson & Chopik, 2020; Weiss et al., 2013; Weiss & Freund, 2012; Weiss & Kornadt, 2018; Weiss & Lang, 2012). People tend to report feeling up to 20% younger than they actually are, and this percentage grows as people approach older adulthood themselves (Kleinspehn-Ammerlahn et al., 2008; Rubin & Berntsen, 2006). In this way, older adults in particular tend to “put off” old age by identifying as a younger person. As they get older, adults not only report feeling younger but also report a desire to live to older age and see the transition from middle age to old age as farther off in the future (Chopik et al., 2018). Again, having a subjective age closer to one's chronological age is thought to at least partially reflect this dissociative process and in turn enhance positive self-views (Hess et al., 2017). In other words, a subjective age that is closer to one's chronological age could thus be considered as a behavioral marker of more positive attitudes toward older adults, as these adults do not feel the need to “distance” from the stigma of aging and older adulthood.

Cultural Variation in Age Bias

Much of the aforementioned research on age biases and subjective age has been conducted in individualistic and industrialized cultures. Nevertheless, bias against older adults is likely present to some degree in every culture, but may also

vary across cultures. Indeed, Löckenhoff et al. (2009) found a cultural consensus that people have negative views toward aging and older adults. Consistent age stereotypes have been found cross-culturally, such that people see the elderly as more warm or benevolent than they are competent (Cuddy et al., 2009; Harwood et al., 1996). Similarly, past research has found consistency in subjective age estimates between collectivistic and individualistic cultures, albeit few cultures are typically studied (Hess et al., 2017). It is important to acknowledge, though, that past research examining cross-cultural variation in aging attitudes and the self-perceptions of older adults has found quite a deal of variation based on the developmental and economic characteristics of countries. For example, in more modernized cultures (i.e., countries with higher standing in physical health, economics, education, and urbanization), older adults are held in higher esteem and report higher life satisfaction (Huang, 2013; Swift et al., 2014; Vauclair et al., 2014). Local conditions of a country also exacerbate the negative effects of old age identification—identifying more with older adults (often associated with worse outcomes) is associated with worse subjective health in countries where older adults have low social status (Marques et al., 2015). These studies show that even broad cultural indicators (e.g., the modernization and the social status of older adults) have important implications for older adults' health and well-being.

Individualism and Collectivism

Cultures differ in many ways, including in how people from a given culture interact with others. For example, there are well-known differences in values between collectivistic and individualistic cultures (Markus & Kitayama, 1991; Triandis et al., 1988). Collectivistic cultures view the self as embedded in the collective group, placing emphasis on harmony within that group and interdependence among the group's members. Collectivist cultures ultimately aim to achieve group goals. Notably, respecting the elderly, as seen in the concept of filial piety and other forms of elder respect, is widespread in Eastern Asia and other collectivistic regions (Sung, 2001). In contrast, individualist cultures tend to emphasize the independence and autonomy of individual group members and see individual goals as more important than group goals. Individualism can be seen in norms such as respect for differences between individuals, as opposed to a particular respect for elders. Furthermore, in individualistic societies, others are still seen as important, but not because of mutual need or respect. Rather, others serve as a tool by which to appraise and affirm oneself (Markus & Kitayama, 1991).

Such differences in culture might make it reasonable to suspect that there would be differences in age bias across culture as well. Collectivistic values such as filial piety may partially reduce the strong age bias seen in widely individualistic societies. Indeed, there is evidence to support this

idea. Research suggests that collectivistic cultures tend to have more positive attitudes in certain domains toward the elderly and tend to be less biased toward older adults (Boduroglu et al., 2006; Vaclair et al., 2017; Xiao et al., 2013). In fact, the negative impacts of stereotype threat found in older adults in individualistic cultures are mitigated in collectivistic cultures, especially when cultural values are primed (Levy & Langer, 1994; Tan & Barber, 2020). Even so, there is also evidence to suggest that cultures may exert little influence in modulating the effects of age bias. For example, although Vaclair et al. (2017) found the elderly to be deemed more competent and admired in collectivistic cultures, these cultures also saw the elderly as higher in warmth than competence, which is consistent with findings from individualistic cultures (Cuddy & Fiske, 2002). Similarly, Boduroglu et al. (2006) found that while Chinese people were more positive toward the elderly in relation to social and emotional domains, they held negative views about the elderly in cognitive and physical domains.

In contrast, some research has found that collectivistic cultures are *more* negatively biased against old age than individualistic cultures (Huang, 2013; Luo et al., 2013; North & Fiske, 2015b). North and Fiske (2015b) set out to resolve these diverging findings by examining attitudes toward aging in a meta-analytic review of 37 papers. They found that Eastern cultures held *more negative attitudes* toward older adults. Given that much of the research addressing age bias, including North and Fiske's aforementioned work, comprised data from primarily industrialized nations, there is an opportunity to expand these findings by examining a broader array of countries and participants. In the current study, we draw on a larger sampling of countries—both developed and less developed—and individuals from different age groups to examine cultural differences in attitudes toward older adults.

The Current Study

In the current study, we examined cultural variation in implicit and explicit age bias across a diversity of cultures. Furthermore, we likened variation in bias to a host of other cultural factors—gross domestic product (GDP), income inequality, and cultural values (e.g., Hofstede's cultural dimensions of individualism/collectivism, power distance, masculinity/femininity, uncertainty avoidance, long-term orientation, and indulgence/restraint; Hofstede et al., 2010). We chose this set of characteristics based on the large amount of research implicating them in the shaping of people's attitudes and dispositions, particularly toward older adults (Bochner & Hesketh, 1994; de Mooij & Hofstede, 2011; Franke & Nadler, 2008; Litvin et al., 2004; Marques et al., 2015; McCrae & Terracciano, 2005; Swift et al., 2014; Vaclair et al., 2014). We expected individualistic and collectivistic cultures to differ in age bias, with collectivistic cultures showing less bias against old age, both explicitly

and implicitly, than individualistic cultures. Regarding the other cultural values and characteristics, because of the lack of data on these factors, we took a largely exploratory approach in predicting variation in age attitudes.

We employed a wide variety of measures of age bias, including one implicit measure and three explicit measures (a single-item explicit evaluation and two feeling thermometers). Finally, we also used subjective age as an index of age attitudes. Although often considered to be an independent variable (Kleinspehn-Ammerlahn et al., 2008; Kotter-Grühn et al., 2016; Rioux & Mokoukolo, 2013), subjective age can also be used as an indirect measure of age-group dissociation in which people psychologically distance from stigmatized group (i.e., older adults) by affiliating with another group (i.e., younger adults). This is one explanation for why older adults report increasingly younger subjective ages as they chronologically age—they are seeking out a way to distance from the stigma of older adulthood (Chopik et al., 2018; Montepare, 2009; Montepare & Lachman, 1989; Weiss & Freund, 2012; Weiss & Kornadt, 2018; Weiss & Lang, 2012). To our knowledge, ours is the first study to examine cultural variation in subjective age. Altogether, we expected collectivistic cultures to also report a younger subjective age compared with individualistic cultures, although in closer proximity to their chronological age.

Method

Participants and Procedure

Participants were drawn from a large sample of participants from the Project Implicit Demo Site, a website that hosts studies on the IAT. Data were collected from December 2002 to December 2018. From the larger sample ($N = 2,341,594$), all but 911,982 participants were excluded because they were younger than 15 years, older than 95 years, had missing data on all country-level variables, were from countries with fewer than 100 participants, had an error rate greater than 30% across all trials, or had an error rate above 40% on any individual block and a latency of 400 ms or more on fewer than 10% of IAT trials, which are consistent with previous exclusionary criteria using the IAT (Greenwald et al., 2003; Nosek et al., 2007; Westgate et al., 2015). No other exclusions were made.

The final analytic sample comprised 911,982 individuals (67.6% female) from 68 different countries. The overall sample ranged in age from 15 to 89 ($M = 27.42$, $SD = 12.23$) years; the median level of education was some college. The majority of respondents were from the United States (86.2%). The sample size for individual countries ranged widely, from 104 to 712,607 ($M_{\text{size}} = 12,077$; $Mdn_{\text{size}} = 425.5$). Including countries with fewer than 100 participants did not substantively change the results below. See Table 1 for descriptives and sample sizes for each country. The survey and IAT stimuli were presented entirely in English. Other language

Table 1. Descriptive Statistics for Each Country.

Country	Implicit bias			Explicit bias			Subjective age			Feelings toward older adults			Feelings toward younger adults		
	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N
Albania	0.385	0.430	216	3.335	0.866	248	1.828	10.432	93	6.763	2.173	253	7.008	2.064	253
Algeria	0.460	0.404	122	3.319	0.936	135	3.933	9.570	60	6.884	2.005	147	6.980	2.120	148
Argentina	0.505	0.369	805	3.432	0.761	901	0.761	11.423	213	6.240	1.842	919	6.857	1.783	919
Australia	0.448	0.387	10,669	3.370	0.765	11,203	2.002	8.787	4,861	6.610	1.850	11,611	6.930	1.826	11,614
Bahrain	0.454	0.371	104	3.400	0.883	120	-0.511	24.074	45	6.432	2.186	125	6.608	2.271	125
Bangladesh	0.417	0.364	104	3.504	0.858	125	-1.595	12.638	42	6.434	2.284	129	7.008	2.108	129
Brazil	0.460	0.398	1,364	3.382	0.841	1,542	-0.011	9.341	562	6.453	1.905	1,566	6.824	1.958	1,566
Bulgaria	0.504	0.404	186	3.542	0.724	212	-1.782	14.312	87	6.534	1.810	221	7.249	1.904	221
Canada	0.436	0.389	25,975	3.353	0.776	27,192	1.036	8.494	10,535	6.766	1.894	28,074	7.011	1.874	28,076
Chile	0.480	0.386	233	3.450	0.758	258	1.293	5.194	92	6.284	1.768	264	6.747	1.790	265
China	0.440	0.379	2,230	3.407	0.786	2,422	0.172	7.072	1,108	6.674	1.874	2,497	6.487	1.790	2,497
Colombia	0.458	0.386	423	3.408	0.784	451	0.337	5.090	205	6.575	1.914	466	7.090	1.892	467
Croatia	0.496	0.363	420	3.570	0.707	442	0.820	9.263	161	6.223	1.805	457	7.280	1.845	457
Cyprus	0.570	0.384	401	3.479	0.700	409	1.646	8.440	178	6.958	1.936	426	7.738	1.805	427
Czech Republic	0.530	0.378	304	3.550	0.735	329	0.782	4.615	147	6.033	1.811	334	6.979	1.778	334
Dominican Republic	0.523	0.364	104	3.451	0.768	113	0.696	6.014	46	6.930	1.968	114	7.535	2.083	114
Ecuador	0.408	0.388	128	3.414	0.857	140	2.145	10.159	62	6.715	2.131	144	7.208	1.921	144
Egypt	0.460	0.369	288	3.366	0.810	303	-0.043	8.667	140	6.670	2.005	315	6.864	1.839	316
Estonia	0.447	0.397	140	3.396	0.855	144	0.855	3.937	55	6.179	1.670	151	6.649	1.916	151
Finland	0.426	0.397	1,332	3.415	0.734	1,433	1.162	5.855	568	6.428	1.731	1,466	6.759	1.737	1,466
France	0.525	0.383	1,641	3.422	0.759	1,799	2.011	7.652	747	6.080	1.702	1,836	6.676	1.710	1,836
Georgia	0.472	0.385	278	3.256	0.836	277	1.667	6.354	144	7.210	2.059	295	7.241	2.148	295
Germany	0.525	0.371	5,224	3.452	0.709	5,683	1.450	8.045	1,477	6.065	1.669	5,816	6.735	1.732	5,816
Ghana	0.586	0.391	120	3.380	0.929	129	2.453	3.800	64	6.964	1.942	138	7.391	1.965	138
Guatemala	0.357	0.378	127	3.244	0.868	135	2.857	6.380	56	7.203	1.930	138	7.152	2.032	138
Hong Kong	0.473	0.382	1,116	3.437	0.770	1,217	0.945	8.184	453	6.467	1.777	1,249	6.560	1.727	1,248
Hungary	0.519	0.363	428	3.554	0.679	460	1.006	8.075	157	5.972	1.834	469	6.917	1.744	470
India	0.391	0.386	3,455	3.433	0.775	3,828	2.483	6.780	1,524	6.771	1.914	3,907	6.901	1.817	3,909
Indonesia	0.423	0.363	409	3.389	0.801	452	-0.563	8.579	215	6.410	1.838	468	6.560	1.851	468
Israel	0.492	0.397	747	3.465	0.786	792	1.809	10.203	256	6.551	1.863	818	6.808	1.786	818
Italy	0.546	0.363	1,112	3.438	0.761	1,221	0.207	10.471	357	6.298	1.700	1,241	6.912	1.824	1,241
Japan	0.466	0.395	1,133	3.326	0.814	1,213	1.202	7.379	396	6.491	1.882	1,245	6.320	1.831	1,246
Kuwait	0.398	0.421	132	3.197	0.836	142	0.887	9.124	71	6.966	1.995	146	6.651	1.910	146
Latvia	0.508	0.371	153	3.549	0.705	162	0.622	4.023	74	6.041	1.869	169	7.379	1.749	169
Lithuania	0.520	0.362	259	3.518	0.773	284	0.686	7.908	102	6.154	1.909	292	7.366	1.876	292
Malaysia	0.460	0.373	958	3.343	0.785	1,072	0.571	7.700	445	6.504	1.799	1,101	6.559	1.814	1,101
Mexico	0.457	0.383	1,285	3.416	0.780	1,352	0.257	10.050	541	6.657	2.008	1,389	7.146	1.983	1,392
Netherlands	0.518	0.372	3,200	3.481	0.752	3,359	1.661	6.947	1,179	6.336	1.550	3,502	7.029	1.510	3,502
New Zealand	0.406	0.386	2,502	3.319	0.770	2,653	2.521	7.904	1,045	6.721	1.823	2,733	6.877	1.813	2,734
Nigeria	0.454	0.425	121	3.444	0.733	126	1.900	6.135	50	6.737	2.037	137	7.336	1.840	137
Norway	0.455	0.367	1,835	3.470	0.735	2,003	0.545	8.973	365	6.303	1.843	2,051	6.914	1.802	2,052
Pakistan	0.400	0.404	208	3.367	0.839	256	0.469	5.738	81	6.735	1.898	264	7.136	1.965	264
Peru	0.533	0.339	232	3.524	0.749	252	0.260	7.430	123	6.487	1.742	261	7.015	1.960	264
Philippines	0.406	0.390	932	3.308	0.848	1,008	1.199	7.211	391	6.751	1.888	1,046	6.883	1.849	1,046
Poland	0.478	0.393	717	3.493	0.768	767	-0.236	7.375	297	6.064	1.827	798	6.692	1.748	798
Puerto Rico	0.448	0.379	463	3.281	0.793	494	1.242	9.827	182	7.024	1.982	506	7.109	2.064	506
Qatar	0.414	0.350	125	3.211	0.800	128	1.357	5.147	56	6.992	1.743	131	6.824	1.871	131
Romania	0.523	0.384	492	3.632	0.798	546	0.773	6.902	220	6.175	1.896	561	7.148	1.888	561
Russia	0.512	0.371	400	3.484	0.748	434	1.548	6.369	186	6.076	1.871	447	6.803	1.685	447
Saudi Arabia	0.389	0.392	254	3.195	0.869	272	-0.965	8.326	141	6.591	2.092	296	6.153	2.010	295

(continued)

Table 1. (continued)

Country	Implicit bias			Explicit bias			Subjective age			Feelings toward older adults			Feelings toward younger adults		
	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N
Serbia	0.481	0.387	138	3.500	0.745	146	2.038	5.579	80	6.230	1.807	148	7.020	1.875	148
Singapore	0.467	0.394	2,581	3.391	0.811	2,749	0.401	7.624	1,213	6.562	1.666	2,831	6.658	1.698	2,832
Slovakia	0.561	0.356	117	3.504	0.697	121	1.625	7.121	56	6.254	1.992	126	7.142	1.947	127
Slovenia	0.504	0.398	288	3.431	0.662	313	1.460	4.682	139	6.602	1.913	314	7.131	1.891	314
South Africa	0.466	0.394	716	3.340	0.857	727	2.855	7.386	330	6.653	1.849	787	7.018	1.885	789
South Korea	0.421	0.384	1,053	3.462	0.800	1,144	0.601	5.614	486	6.422	1.902	1,167	6.358	1.824	1,169
Spain	0.491	0.373	1,204	3.470	0.757	1,320	0.872	8.237	384	6.206	1.712	1,336	6.864	1.766	1,336
Sweden	0.486	0.386	2,276	3.384	0.758	2,398	1.794	7.214	796	6.388	1.840	2,469	6.713	1.838	2,469
Switzerland	0.503	0.381	1,570	3.378	0.686	1,700	3.210	7.525	595	6.352	1.722	1,729	6.800	1.728	1,729
Taiwan	0.414	0.381	627	3.409	0.810	692	-0.335	7.782	248	6.492	1.808	711	6.156	1.807	711
Thailand	0.421	0.380	489	3.335	0.863	538	1.412	7.161	238	6.794	1.867	558	6.161	1.839	559
Trinidad and Tobago	0.547	0.350	140	3.184	0.876	147	3.290	5.764	62	6.987	1.810	153	6.915	1.781	153
Turkey	0.465	0.389	605	3.467	0.814	688	0.224	8.199	290	6.404	1.910	711	7.052	1.843	711
Ukraine	0.480	0.330	122	3.575	0.718	120	0.339	8.487	59	6.230	1.948	126	6.690	1.848	126
United Kingdom	0.458	0.392	20,650	3.293	0.742	21,915	3.493	8.340	8,904	6.559	1.768	22,688	6.739	1.789	22,684
United States	0.442	0.385	712,607	3.316	0.790	734,422	0.635	8.441	299,394	6.955	1.957	759,461	7.103	1.952	759,726
Venezuela	0.439	0.363	155	3.435	0.809	168	1.213	5.447	61	6.427	1.779	171	6.883	1.994	171
Vietnam	0.412	0.387	271	3.433	0.919	305	-0.536	10.166	151	6.844	1.817	307	6.498	1.871	307

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 et al., 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, 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, 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 with how fast they categorize items in Condition 2 are considered to have an implicit preference for young people compared with old people (Greenwald et al., 2003).

The IAT followed the standardized seven-block format; order of the two category pairings was 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).

Subjective Age

As in previous research (Montepare, 2009), participants’ subjective age was assessed with an open-ended item, “How old do you feel?” Subjective age was calculated by subtracting this felt age from their actual, self-reported age. Subjective age was only available for a subset of the subjects ($N = 344,141$).

Explicit Preferences for Young People Compared to Old People

From 2002 until September 2006, explicit biases 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 biases toward 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. In the analyses below, we also controlled for year of data collection to control for any changes in the substantive variables of interest over time.¹ The mean of the consolidated explicit bias measure was above the midpoint, suggesting an explicit preference for young people compared with old people.

Participants also rated the perceived warmth of younger and older adults. The items read, “How warm or cold do you feel toward young [old] people” ranging on a scale from 0 (*extremely/very cold*) to 10 (*extremely/very warm*). This feeling thermometer was specially designed for Project Implicit studies and has a long history in the attitudes literature (Liu & Wang, 2015; Nosek et al., 2002; Wilcox et al., 1989).

Country-Level Characteristics

Country-level GDP per capita ($n = 65$ countries had available data; Central Intelligence Agency, 2011) and Gini index of income inequality ($n = 63$ countries had available data; Central Intelligence Agency, 2011) were gathered as country-level characteristics that measure the economic conditions of a country.

Hofstede’s dimensions of cultural variation were also included in the analysis. Hofstede and colleagues (2010) suggest that country-level differences in societal values can be characterized by six dimensions. Power Distance (PDI) measures the degree to which a culture is accepting of inequality. Individualism/collectivism (IDV) refers to the degree to which people prefer loosely knit social networks and individuality (higher values) versus tightly knit social networks and interdependence with others (lower values). Masculinity/Femininity (MAS) assesses the degree to which a culture can be characterized by assertiveness and competitiveness (masculinity; higher values) or nurturance and cooperation (femininity; lower scores). Uncertainty Avoidance (UAI) measures the degree to which a country’s citizens are uncomfortable with uncertainty and ambiguity. Long-Term Orientation (LTO) assesses the outlook of a culture; countries with a long-term orientation place more importance on the future. Indulgence/restraint (IVR) refers to the degree to which a society allows free gratification of basic and natural human drives related to enjoyment of life (relative to a suppression of gratification of needs by strict social norms). Scores on each of these dimensions were

gathered from Hofstede’s latest reporting on cultural dimensions (Hofstede et al., 2010). Country-level scores on each of the dimensions were available for 64 countries in the current analyses (and for a total of 62 countries for long-term orientation and indulgence vs. restraint).²

Covariates

There were a number of individual- and country-level covariates that were introduced into the models below. Given the effects of sociodemographic characteristics on reports of bias toward older adults (Chopik & Giasson, 2017), we controlled for age,³ gender, and education. We also controlled for the number of IATs that the participant reported completing. This was entered as a control to approximate how much exposure they had to implicit bias tests and to somewhat account for the fact that they may have taken this particular IAT in the past, which is impossible to verify (although some quality control measures [e.g., whether participants matched on IP addresses and sociodemographic characteristics] suggested that this was not a large concern). We controlled for the year of data collection (i.e., 2002–2018) to account for the cultural-level changes in bias (see Charlesworth & Banaji, 2019). Based on previous research (North & Fiske, 2015b), we also gathered each country’s senior dependency ratio, which is the percentage of a country’s population older than the age of 65 relative to the country’s working-age population (World Bank, World Development Indicators, 2013). Inclusion of this variable allowed us to see whether any bias might be attributable to a pressure to accommodate the increasing number of older adults in a society (North & Fiske, 2015b). Finally, because the IAT and stimuli were presented entirely in English (and because there was no measure of English literacy available at the individual level), we controlled for percentage of English speakers in each country.

Results

The list of countries and descriptive information on the study variables can be found in Table 1. At the individual level, implicit bias was positively associated with explicit bias ($r = .13, p < .001$), subjective age discrepancies ($r = .05, p < .001$), warmth toward younger adults ($r = .04, p < .001$), and negatively associated with warmth toward older adults ($r = -.10, p < .001$). Explicit bias was negligibly associated with subjective age ($r = .01, p < .001$), positively associated with warmth toward younger adults ($r = .36, p < .001$), and negatively associated with warmth toward older adults ($r = -.35, p < .001$). A greater subjective age discrepancy was positively correlated with warm feelings toward older ($r = .03, p < .001$) and younger adults ($r = .06, p < .001$). Finally, feelings of warmth toward older and younger adults were positively correlated with one another ($r = .37, p < .001$).

Because respondents were nested within countries, a random-coefficient model predicting each attitude (e.g., implicit

Table 2. Multilevel Model Predicting Implicit Bias.

Variables	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	LB	UB	<i>r</i>
Long-Term Orientation	.001	<.001	2.409	.021	<.001	.001	.371
Indulgence/Restraint	<.001	<.001	0.936	.355	<.001	.001	.151
Uncertainty Avoidance	.001	<.001	2.070	.046	<.001	.001	.336
Masculinity/Femininity	<.001	<.001	-1.611	.115	-.001	<.001	-.252
Individualism	.001	<.001	3.084	.004	<.001	.002	.432
Power Distance	.001	<.001	2.187	.034	<.001	.002	.323
Inequality	.001	.001	0.774	.444	-.001	.002	.124
GDP	-.008	.005	-1.792	.081	-.017	.001	-.277
Gender	-.038	<.001	-81.320	<.001	-.038	-.037	-.092
Age	.001	<.001	15.253	<.001	.001	.001	.017
Education	-.002	<.001	-7.191	<.001	-.002	-.001	-.008
Number of IATs	-.069	<.001	-164.530	<.001	-.070	-.068	-.183
Year of Data Collection	-.001	<.001	-11.391	<.001	-.002	-.001	-.013
Population Aging	<.001	.001	0.609	.545	-.001	.002	.087
% English	<.001	<.001	-2.248	.806	-.001	.001	-.042

Note. LB = lower bound; UB = upper bound; GDP = gross domestic product; IAT = implicit association test.

Table 3. Multilevel Model Predicting Explicit Bias.

Variables	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	LB	UB	<i>r</i>
Long-Term Orientation	.001	<.001	1.954	.061	<.001	.002	.349
Indulgence/Restraint	<.001	<.001	0.124	.902	-.001	.001	.023
Uncertainty Avoidance	.001	<.001	2.262	.033	<.001	.002	.423
Masculinity/Femininity	-.001	<.001	-1.439	.161	-.001	<.001	-.260
Individualism	.002	.001	2.929	.006	<.001	.003	.438
Power Distance	.001	.001	1.650	.109	<.001	.002	.278
Inequality	-.001	.001	-0.624	.537	-.003	.002	-.113
GDP	-.016	.006	-2.588	.015	-.029	-.003	-.427
Gender	-.094	.001	-101.879	<.001	-.096	-.092	-.113
Age	-.014	<.001	-171.149	<.001	-.014	-.014	-.187
Education	.007	<.001	17.244	<.001	.007	.008	.019
Number of IATs	.001	.001	0.956	.339	-.001	.002	.001
Year of Data Collection	-.013	<.001	-57.211	<.001	-.013	-.012	-.064
Population Aging	-.002	.001	-1.417	.164	-.004	.001	-.216
% English	<.001	<.001	-0.943	.355	-.001	<.001	-.186

Note. LB = lower bound; UB = upper bound; GDP = gross domestic product; IAT = implicit association test.

biases, explicit biases, subjective age, and feeling thermometers for old and young people, respectively) was created, using the SPSS MIXED procedure (Peugh & Enders, 2005).⁴

Participant age, participant gender (-1 = male, 1 = female), education, number of IATs taken, year of data collection, and country-level variables (i.e., GDP, Gini, PDI, IDV, MAS, UAI, LTO, IVR, population aging rate, and percentage English speakers) were entered as predictors of bias across countries. The results of these analyses can be found in Tables 2 to 6.

For implicit bias (Table 2), living in countries with greater long-term orientation, uncertainty avoidance, power distance, and individualism were all associated with greater implicit bias against older adults. Replicating past research

(Chopik & Giasson, 2017), men, older adults, and people with lower levels of education reported higher implicit bias. Those who had taken a larger number of IATs and took the survey more recently reported lower levels of implicit bias.

For explicit bias (Table 3), living in countries with greater uncertainty avoidance and individualism was associated with greater explicit bias. People living in countries higher in GDP reported lower explicit age bias, which is consistent with previous research (Swift et al., 2014; Vauclair et al., 2014). Similar to the findings for implicit bias, living in countries with high levels of long-term orientation was associated with greater explicit bias (though this result was marginally significant). Replicating past research (Chopik & Giasson, 2017), men, younger adults, and people with higher

Table 4. Multilevel Model Predicting Subjective Age.

Variables	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	LB	UB	<i>r</i>
Long-Term Orientation	<.001	.005	-0.034	.973	-.010	.009	-.007
Indulgence/Restraint	-.002	.005	-0.376	.709	-.012	.009	-.066
Uncertainty Avoidance	-.011	.005	-2.242	.036	-.021	-.001	-.435
Masculinity/Femininity	-.001	.005	-0.311	.758	-.011	.008	-.058
Individualism	.005	.006	0.821	.416	-.007	.018	.117
Power Distance	.012	.007	1.781	.083	-.002	.025	.276
Inequality	-.009	.013	-0.677	.504	-.035	.018	-.125
GDP	-.090	.066	-1.353	.187	-.225	.046	-.247
Gender	.119	.014	8.649	<.001	.092	.146	.015
Age	.365	.001	300.630	<.001	.362	.367	.461
Education	-.167	.006	-25.959	<.001	-.179	-.154	-.045
Number of IATs	-.160	.012	-12.962	<.001	-.184	-.136	-.022
Year of Data Collection	-.113	.004	-26.268	<.001	-.122	-.105	-.045
Population Aging	.014	.013	1.060	.295	-.012	.040	.158
% English	-.001	.004	-0.291	.774	-.010	.008	-.060

Note. LB = lower bound; UB = upper bound; GDP = gross domestic product; IAT = implicit association test.

Table 5. Multilevel Model Predicting Warmth Toward Older Adults.

Variables	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	LB	UB	<i>r</i>
Long-Term Orientation	-.005	.001	-3.232	.003	-.008	-.002	-.463
Indulgence/Restraint	-.001	.002	-0.617	.540	-.004	.002	-.098
Uncertainty Avoidance	-.004	.002	-2.436	.020	-.007	-.001	-.381
Masculinity/Femininity	.002	.001	1.461	.152	-.001	.005	.224
Individualism	-.006	.002	-3.624	.001	-.010	-.003	-.478
Power Distance	-.003	.002	-1.309	.197	-.006	.001	-.195
Inequality	.002	.004	0.506	.615	-.006	.010	.079
GDP	.046	.020	2.298	.027	.006	.087	.338
Gender	.293	.002	130.265	<.001	.289	.298	.141
Age	.015	<.001	73.853	<.001	.014	.015	.081
Education	-.004	.001	-3.565	<.001	-.006	-.002	-.004
Number of IATs	.134	.002	64.533	<.001	.130	.138	.070
Year of Data Collection	.031	.001	56.114	<.001	.030	.032	.061
Population Aging	.005	.004	1.325	.191	-.002	.012	.180
% English	.002	.001	1.374	.178	-.001	.005	.222

Note. LB = lower bound; UB = upper bound; GDP = gross domestic product; IAT = implicit association test.

levels of education reported higher explicit bias. Those who took the survey more recently reported lower levels of explicit bias.

For subjective age (Table 4), the lone significant predictor at cultural level was uncertainty avoidance—living in countries with higher uncertainty avoidance was associated with a smaller subjective age discrepancy. Women, older adults, and people with lower levels of education report a greater subjective age discrepancy (i.e., there was a larger gap between their chronological age and the age they felt, suggesting a type of distancing from the stigma of older adulthood; Weiss & Kornadt, 2018). Individuals who took a larger number of IATs and took the survey more recently reported a smaller subjective age discrepancy.

For feelings of warmth toward older adults (Table 5), living in countries with greater long-term orientation, uncertainty avoidance, and individualism were all associated with colder feelings toward older adults. Countries higher in GDP reported warmer feelings toward older adults. Women, older adults, and people with lower levels of education report greater warmth toward older adults. Those who have taken more IATs and took the survey more recently reported warmer feelings toward older adults.

For feelings of warmth toward younger adults (Table 6), living in highly individualistic and low-GDP countries is associated with warmer feelings toward younger adults. Women, younger adults, and people with lower levels of education report warmer feelings toward younger adults.

Table 6. Multilevel Model Predicting Warmth Toward Younger Adults.

Variables	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	LB	UB	<i>r</i>
Long-Term Orientation	-.002	.002	-0.991	.328	-.006	.002	-.161
Indulgence/Restraint	.001	.002	0.671	.506	-.003	.006	.108
Uncertainty Avoidance	.000	.002	0.230	.819	-.004	.005	.039
Masculinity/Femininity	-.001	.002	-0.645	.523	-.005	.002	-.103
Individualism	.006	.002	2.648	.011	.001	.011	.384
Power Distance	.005	.002	1.831	.074	.000	.010	.275
Inequality	.002	.005	0.489	.628	-.008	.013	.078
GDP	-.080	.026	-3.087	.004	-.133	-.028	-.445
Gender	.058	.002	25.318	.000	.053	.062	.028
Age	-.011	.000	-53.594	.000	-.011	-.010	-.058
Education	-.008	.001	-7.157	.000	-.010	-.006	-.008
Number of IATs	.113	.002	54.155	.000	.109	.118	.059
Year of Data Collection	-.014	.001	-24.687	.000	-.015	-.013	-.027
Population Aging	.008	.004	1.780	.082	-.001	.017	.251
% English	-.001	.002	-0.741	.463	-.005	.002	-.122

Note. LB = lower bound; UB = upper bound; GDP = gross domestic product; IAT = implicit association test.

Those who have taken more IATs reported warmer feelings toward younger adults; those who completed the survey more recently reported colder feelings toward younger adults.

Summary

To summarize, living in countries with greater long-term orientation, uncertainty avoidance, and individualism were all associated with greater implicit bias, explicit bias, and less warmth toward older adults, albeit sometimes only marginally so. There were occasionally a few other significant predictors (e.g., GDP), but they were not consistent across models. Women and people with lower levels of education reported less explicit bias and warmer feelings toward all groups. Younger adults felt warmer toward younger adults; older adults felt warmer toward older adults. Previous exposure to the IAT was associated with more positive feelings and attitudes toward older adults. People who took the survey more recently also reported more positive feelings and attitudes toward older adults, reproducing and replicating previous research (Charlesworth & Banaji, 2019). The age, gender, and education effects all reproduce past research (Chopik et al., 2018; Chopik & Giasson, 2017).

Supplementary Analyses: Beyond the Hofstede Model of Cultural Dimensions

In addition to the cultural dimensions provided by Hofstede, there are many ways in which cultures differ from one another. There have also been many efforts to characterize these cultural differences. Two such prominent models are dimensions derived from the GLOBE study (House et al., 2004) and Schwartz's (2006) cultural value orientations.

The GLOBE study characterizes cultures using nine dimensions (i.e., performance orientation, uncertainty avoidance, humane orientation, institutional collectivism, in-group collectivism, assertiveness, gender egalitarianism, future orientation, and power distance). These nine dimensions are also bifurcated into *societal practices* and *societal values* (yielding 18 factors). Schwartz's taxonomy identifies seven orientations on which cultures can differ (e.g., intellectual autonomy, affective autonomy, embeddedness, egalitarianism, hierarchy, harmony, and mastery).

At the request of the action editor, we examined how each of our five outcomes could be predicted from the GLOBE and Schwartz taxonomies as well. The results for the GLOBE indicators (Supplemental Tables 1–5) and the Schwartz (Supplemental Tables 6–10) are provided in the supplement.

For the GLOBE indicators (which were available for 45 of 68 countries), none of the dimensions significantly predicted implicit bias ($ps > .06$), explicit bias ($ps > .13$), or subjective age ($ps > .06$). There were occasionally some significant effects when predicting feelings of warmth toward older and younger adults, although the findings were often inconsistent. For example, gender egalitarianism predicted colder feelings toward older adults when operationalized as societal practice but warmer feelings toward older adults when operationalized as a societal value. Institutional collectivism predicted colder attitudes toward older adults. There were few significant predictors of feelings of warmth toward younger adults. Given that these characteristics generally did not predict most of the outcomes and did so only inconsistently for one of the outcomes (e.g., feelings toward older adults), we hesitate to conclude that attitudes toward older adults vary systematically according to GLOBE indicators.

For the Schwartz value orientations (which were available for 65 of 68 countries), none of the orientations significantly predicted implicit bias ($ps > .06$) or explicit bias ($ps > .13$). The most consistent predictor of the remaining three outcomes was mastery (e.g., the self-assertion to master, direct, and change an environment to attain group/personal goals). Living in a country with higher levels of mastery was associated with an older subjective age and warmer feelings to both younger and older adults. Living in a country higher in hierarchy was associated with larger subjective age discrepancy and colder feelings toward younger adults. The remaining orientations were not significant and these few effects were the only significant ones across the outcome measures. Altogether, with the exception of mastery, Schwartz's cultural values are largely unrelated to attitudes toward older adults.⁵

Discussion

Although not as widely researched as other forms of bias (i.e., gender, race), age bias has increasingly been a subject of study in social psychology in recent decades. Prejudice against older adulthood has negative implications for older adults (i.e., cognitively, medically, in the workforce), as well as negative impacts on health and well-being for those who hold these biased beliefs (e.g., Barber & Mather, 2013; Bowling, 2007; Levy & Myers, 2004; Minichiello et al., 2000; North & Fiske, 2016). Bias against older adults is seen both explicitly and implicitly, but further research is warranted on how these biases might vary across cultures (Chopik & Giasson, 2017; Jelenec & Steffens, 2002; Levy & Banaji, 2002). For example, collectivistic cultures emphasize harmonious interdependence among members, whereas individualistic cultures celebrate the autonomy of the individual (Markus & Kitayama, 1991). Related to the idea of group harmony, collectivistic cultures also tend to endorse deep-rooted concepts of elder respect (Sung, 2001), which could mitigate age bias and the negative effects seen in individualistic cultures.

In the current study, we examined how age bias varied across 68 countries among more than 900,000 participants. We examined implicit and explicit age bias, as well as differences in subjective age and feelings of warmth toward younger and older adults, across cultures. Using Hofstede's dimensions of cultural variation (Hofstede et al., 2010), we expected to find that countries higher in collectivism would be less biased, implicitly and explicitly, against older adults. Indeed, living in countries with greater individualism was associated with greater implicit and explicit bias (though the latter was marginally significant), as well as colder feelings toward older adults. Notably, this is not to say that age bias does not exist in collectivistic cultures. Consistent with past research (Cuddy et al., 2009), we found that stereotypes against older adults do still exist across the world; however, we found that this bias is mitigated among cultures low in individualism.

That bias was higher in individualistic cultures supports the hypothesis that collectivistic cultures are less biased against older adults and lends support to the idea that this may be due to culturally embedded concepts of elder respect, such as filial piety. In the example of filial piety, adherents of this idea consider an individual's life as an extension of the lives of their parents (Hwang, 1999). As such, it is proper to treat parents and grandparents with respect and esteem. Given that collectivistic societies emphasize interdependence within groups, it could be that parental respect and honor translates into respect and honor for other elders as well, as other elders are a part of the larger group. Perhaps this respect is unconsciously transferred to nonfamilial adults as well. It could also be the case that treating elders with respect lends to a more positive interaction between younger and older adults, thereby promoting a more positive outlook toward the elderly as a whole. Furthermore, perhaps such a pervasive value in a culture would limit an individual's exposure to socially propagated negative stereotypes, thereby reducing the individual's own negative stereotype. These possibilities and others can be tested in future research.

In light of these findings and in the interest of transparency, it is worthwhile to acknowledge the ways in which our results are inconsistent with previous research. Perhaps the most well-known study from which our study departs from in its conclusions would be that of North & Fiske (2015b). Seeking to reconcile the literature related to age biases across culture, North and Fiske's meta-analysis found that Eastern cultures (a proxy designation to represent collectivism) held more negative explicit views of aging and older adults. It is worth noting that because the sample largely comprised college-aged students, these findings could reflect the sentiments of a younger generation. The current study included participants of widely varying ages, including a sizable sample of older adults. Furthermore, the meta-analysis investigated intergenerational ageism perceptions in primarily industrialized countries (e.g., the United States and China) and only captured explicit attitudes. Our study investigated bias in a wider range of countries, spanning levels of industrialization, and also captured implicit bias as it is traditionally measured via the IAT. Of course, a major strength of North and Fiske's paper is that they attempted to reconcile the many ways that age attitudes have been traditionally studied, and used a wider variety of samples and measures. In the current study, we adopted a relatively narrow sample (i.e. online only) and narrow set of measures. So, at the very least, some of the discrepancies between our work and past work may be attributable to methodological considerations (e.g., the measures of age attitudes), the breadth of countries, and explicit test of collectivism as a predictor, a combination of these considerations, or another reason entirely. It is important to note that we are not suggesting one study is more conclusive than the other, but rather that the studies together—given their relative strengths and weaknesses—can provide us with a more comprehensive view of age bias

across cultures and inspire future research to examine how this cultural variation is made manifest in the everyday lives of older adults.

In addition to investigating the relationship between bias and levels of individualism/collectivism, we examined the relationship between bias and Hofstede's other dimensions of cultural variation in an exploratory manner. These dimensions include *Uncertainty Avoidance* (discomfort with uncertainty and ambiguity), *Long-Term Orientation* (placing more importance on the future), *Power Distance* (being accepting of power inequality), *Masculinity/Femininity* (culture characterized by assertiveness and competitiveness rather than nurturance and cooperation), and *Indulgence/Restraint* (allowing free gratification, as opposed to oppression, of basic and natural human drives related to enjoyment of life). The latter two dimensions were not significant predictors of age bias in any of our analyses.

Interestingly, uncertainty avoidance was the most consistent predictor of biased attitudes. This supports previous research that found cultures high in uncertainty avoidance report more negative views on aging (Löckenhoff et al., 2009). Greater uncertainty avoidance was associated with higher implicit and explicit bias, less warmth toward older adults, and was the only variable to predict reporting of a younger subjective age. This is likely because, although we understand generally what to expect in old age, each individual's experience of aging is different, largely unpredictable, and cannot be controlled. This could be a source of discomfort for those living in a culture that prefers predictability over uncertainty. As a result, greater feelings of uncertainty result in negative affect and poorer evaluations of older adults.

Living in countries with greater levels of long-term orientation (placing more importance on the future) closely resembled the results found with individualism—higher implicit bias and less warmth toward older adults, as well as higher explicit bias (although marginally significant). This finding might appear counterintuitive at first glance. Given that long-term orientation suggests an emphasis on preparing for the future, it might logically follow that cultures high in long-term orientation would place a higher value on older adults (as aging is a shared future for most people). However, as with uncertainty avoidance, perhaps these societies display a bias against older adults because they represent and remind of a future that is difficult to plan for.⁶ Living in a country so focused on the future might also lead some people to think that older adults are to be left behind as they are a reminder of the past (resulting in more negative attitudes). Furthermore, a long-term orientation also necessarily involves making forecasts about the availability of resources in the future. With many countries aging at a faster rate and older adults constituting larger proportions of countries in the next 50 years, intergenerational tension over resources for countries oriented toward the long term may be a contributing factor to this finding. People living in these countries

might view older adults as a burden for both their individual and their country's long-term prospects. However, examining exactly why countries with longer-term orientation are higher in age bias is an open question for future research.

Limitations and Future Directions

One of the strengths of the current study is that it was well powered by a large sample size ($N = 911,982$ from 68 countries) and it contained data collected over a span of 16 years. However, a majority of the sample came from largely individualistic countries. The sample size was great enough that we still had a large sample of participants from collectivistic cultures, but future research should gather data from a population more representative of collectivistic cultures.

An extension of this consideration is that it might be too much to expect cultural values to affect how we evaluate older adults. For example, a study that explicitly pitted cultural values (i.e., collectivism) against personal values (i.e., agency) found that personal values were more closely related to attitudes toward older adults (Zhang et al., 2016). Of course, because cultural influences are often measured at a superordinate level, constructs measured on an individual level are likely to be closely related to an individual-level outcome because it is more proximal (Chopik, 2020). But even in experiments when more proximate versions of cultural values are manipulated, personal values often still predict age attitudes more than cultural values (Zhang et al., 2016). Unfortunately, in the current study, we did not have individual-level information on cultural or personal value characteristics to further test this possibility. Future research can follow the example of Zhang et al. (2016) and also examine the interactions between personal and cultural values on age attitudes.

Further consideration should also be given to the potential limitations of the IAT for assessing implicit attitudes. Although the IAT has been widely used for decades, the validity of the its construct and predictive validity have recently been called into question (Fiedler et al., 2006; Oswald et al., 2013; Schimmack, 2019). Indeed, there is evidence to suggest that, although the IAT may change in response to explicit manipulations, these changes rarely translate to explicit outcomes and can be relatively unstable even over short intervals (Fiedler & Bluemke, 2005; Lai et al., 2016). Another, albeit less discussed, limitation of the IAT is that it relies on the evaluation of older and younger faces drawn from predominantly White American faces. Given cross-cultural variation in emotion, face, and intergroup perceptions (and even the present confounds between age and attractiveness), it is possible that this inherent feature of the IAT likely affected individuals' categorization of young and old faces (Jack et al., 2012; Jones et al., 2020; Krumhuber et al., 2015; Trębický et al., 2018). Because we had a number of other, more face valid measures of bias (and there was some consistency in their predictors across

outcomes), we do have some confidence in most of the findings in the current study. Or, at the very least, they cannot be entirely attributable to a questionable use of the IAT to measure implicit attitudes.

Regarding the measures of bias, future research can measure explicit bias in more varied ways (e.g., North & Fiske, 2015b) and using longer instruments. For example, the explicit bias item that directly asks people's preference for younger versus older adults may seem a bit odd. Age is one of the few universal categories—if people live long enough, they become old. In this way, age bias is different from other forms of prejudice that do not have this permeability. We take some comfort from the fact that this explicit bias measure was moderately correlated with the feeling thermometer measures (which do not have a reference group in the question) and the IAT. Nevertheless, we acknowledge that this item may have been a little too face valid in its administration. Future research can employ longer, more detailed measures of explicit age bias.

The online nature of data collection for the IAT may have also affected our results through participants taking the IAT multiple times. We addressed this in two ways. First, we controlled for the number of IATs that participants took, which served as a proxy for their exposure to implicit bias measures and (possibly) how many times they had taken the Age IAT. Second, we applied a matching procedure that flagged duplicate IP addresses and demographic information. This check yielded very few cases in the present study ($N < 50$). Thus, we feel that duplicate entries likely did not affect our results.

Data examining other widely studied dimensions, such as warmth–competence (Cuddy et al., 2009; Cuddy & Fiske, 2002), were not available in our data set. Research suggests that older adults are seen as warm (trustworthy, sincere) but incompetent, and that this holds true across cultures. In our study, we measured warmth with respect to how warm people felt toward older adults rather than how warm older adults appear to be (which researchers from the stereotype content model traditionally do). Future research should further explore dimensions such as warmth/competence using a variety of measures in a sample as diverse and well-powered as the current study.

In the present study, we found that collectivist cultures tend to be less bias against older adults, but what exactly drives these effects? We have suggested that the reason could lie in the notion of elder respect, such as filial piety, which is found in many collectivistic societies. However, data on exposure to concepts of elder respect and how these ideas may shape stereotypes and bias was not available in our data set. To truly know whether these findings are related to a general respect and honoring of older adults in collectivistic countries, future research should gather specific data on different countries' concepts of elder respect and how those concepts may or may not translate into less biased thoughts and behaviors (as a result of more positive interactions with the elderly, less social promotion of negative stereotypes, etc.).

Furthermore, directions for future research could include looking at whether the outcomes of age bias are different across cultures. If collectivistic cultures are indeed less biased against older adults, do older adults in those countries exhibit fewer negative impacts of age bias compared with their individualistic peers? Although some research has been conducted investigating this question (Levy & Langer, 1994; Tan & Barber, 2020), the field would benefit from replication and additional examination through a large, representative sample. Finally, moving forward, research should focus on investigating bias prevention and intervention. Although this has been studied in individualistic cultures (Levy et al., 2014), it has not, to our knowledge, been studied in collectivistic cultures. Are the same intervention strategies used in individualistic countries effective in collectivistic countries? If not, which interventions are effective in collectivistic countries?

Conclusion

We found that living in countries high in collectivism is associated with less implicit and explicit age bias (although the bias still exists), as well as greater feelings of warmth toward older adults compared to individualistic countries. Given the implications of age bias on those who hold biased attitudes and those on the receiving end of them, additional examination is warranted to further study the causes of and interventions for bias against older adults.

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Data Availability

All data, codebooks, and experimental files are available via the OSF website for Project Implicit. See <https://osf.io/cv7iq/>

Supplemental Material

Supplemental material is available online with this article.

Notes

1. We also created two samples, one of which contained the data before this switch and the other which contained the data after this switch (although this division was somewhat collinear with our covariate of year of data collection). We reran the main analyses on these two samples and the results were consistent in both subsamples. Thus, we combined them for parsimony in the main text.

2. Because the data were collected over such a wide interval (from 2002 to 2018), one might naturally have the suggestion to model time-variant values on Hofstede's cultural dimensions (or the country-level factors of Gini and gross domestic product [GDP]). We considered this possibility of including measures of GDP, Gini, and the cultural dimensions as assessed in 2002 through 2018. However, the inclusion of GDP and Gini in 2002 did not affect the results. We believe that this is primarily attributable to the high degree of stability in both GDP ($r = .98$) and Gini ($r = .90$) from 2002 to 2018. With respect to cultural indicators, many fewer cultures had scores available on the Hofstede dimensions in 2002 (and some dimensions, like indulgence/restraint, were not conceptualized yet). Furthermore, following North and Fiske (2015b; Footnote 6) and Geert Hofstede's website, it is worth noting that cultures change very slowly, and according to Hofstede, scores at any assessment point can be considered up-to-date. Of course, we do acknowledge that cultures do indeed change (Varnum & Grossmann, 2017), but we are a bit skeptical about the degree of change in these characteristics over such a short period of time.
3. Because age was right-skewed (i.e., had mostly young adults), we log-transformed age and reran all the models in the next section. This reduced the skew from $|1.422|$ to $|0.914|$. The results were virtually identical when using this transformation. We used the original age metric for the tables presented here to aid in interpretation. Worth noting, because age was used as a between-subjects variable, the effective sample size of older adults still yielded a fairly estimate for age differences when used in its raw form.
4. An alternative way to analyze the data is to do so at the country level in which means of age bias for the 68 different countries serve as the dependent variable and predicted from the cultural dimensions. We elected a multilevel modeling approach to account for within-country variation in age bias.
5. Yet, another conceptualization of Schwartz's value inventory is the two superordinate orientations of agentic versus communal values. We also computed these two value orientations and reran the analyses with these orientations as predictors of cultural variation in age attitudes. Neither agentic ($ps > .06$) nor communal values ($ps > .09$) predicted any of the dependent variables. These results can be found in Supplemental Tables 11 to 15.
6. One intriguing possibility—that long-term orientation and uncertainty avoidance might interact to predict age attitudes—was recommended by a reviewer. Specifically, this would test whether long-term orientation was associated with more bias (and less warmth) in countries that avoided uncertainty. We examined this interaction for the two dependent variables (implicit age bias, warmth toward older adults) that were predicted by long-term orientation and uncertainty avoidance. This interaction effect was not significant for implicit age bias ($p = .32$) or warmth toward older adults ($p = .55$). This suggests that the effects of long-term orientation and uncertainty avoidance are largely independent of one another.

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