CROSS-CULTURAL COMPARISON OF AGE BIAS AND AGEISM BETWEEN AMERICAN AND GERMAN ADULTS AT VARYING AGES

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This thesis is submitted to the faculty of Radford University in partial fulfillment of the requirements for the degree of Master of Arts in the Department of Psychology

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July 2023

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Abstract

Our society is aging rapidly, and older adults comprise a continuously growing proportion of the population. This shift in population age is expected to carry societal consequences, such as a rise in age discrimination. Ageism, the systematic stereotyping and categorizing of people based on their age, is not only the most commonly experienced kind of prejudice across Europe, but is also, in comparison, more present in individualistic, industrialized countries (Ackerman & Chopik, 2020). This 2 x (participant culture: American, German) x 3 (image age; young, middle, older) x 3 (age group: young, middle, older) study investigated cross-cultural differences in age estimation and attitudes toward older adults in the USA and Germany. Participants from both cultures were recruited via Profilic.co and estimated the age of 12 male celebrities representing three different age groups (young, middle, and older adult) and two cultures (American and German). In addition, participants completed the original Fraboni Scale of Ageism (FSA; Fraboni et al, 1990). Effects of participant age, image age, and participant culture on age estimations repeated measures models were tested. Repeated measures models revealed a significant main effect of age estimations, such that on average, the age of young adults was overestimated while that of old adults was underestimated. This study further demonstrated a significant two-way interaction between image and participant age, such that younger participants were better at estimating the ages of young adults than those of older adults. Lastly, the psychometric analysis of the FSA demonstrated the initial step toward validity and the future use of the translated scale with German-speaking populations.

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Acknowledgments

The completion of this thesis would not have been possible without the endless support of my thesis advisor, Dr. Jenessa Steele. Her scholarly expertise, continuous mentorship, and exceptional support allowed me to grow beyond any measure. It is with genuine pleasure that I express my sincerest gratitude for her constant encouragement. She believed in me when I did not and never doubted my competence to conquer any of the statistical analyses of this project (even when a three-way interaction had me questioning my abilities at times). Dr. Steele provided me with inexhaustible opportunities to develop professional and personal skills that I know have prepared me for success far beyond my academic career.

I would also like to give a special thanks to my committee members, Dr. Kathleen Arnold and Dr. Thomas Pierce, who not only agreed to read this long paper, but have been eager to provide me with guidance and help on every part of it. Both have been beyond insightful, patient, and motivating. Dr. Arnold's and Dr. Pierce's constructive feedback and immense support added great value to my research and academic development even beyond this paper, and I owe both of them my deepest gratitude for introducing me to the field of research, welcoming me to their labs every year, and helping me scale all those hurdles I encountered on the route.

In addition, I need to thank my family for their endless support, their encouragement to pursue my dreams, and for pushing me beyond what I believed to be my limits. Lastly, I would like to thank anyone whom I failed to mention personally in this acknowledgment but who has contributed to the completion of this research project and the fulfillment of the requirements for this master's degree. I received so much support from numerous sources on this journey, and while I cannot list everyone, I am grateful for every one of them.

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Chapter 1: Introduction

Cross-Cultural Comparison of Age Bias and Differences in Age Estimation between the USA and Germany

Similar to racism and sexism, ageism is a rising issue in societies that define their members by race, gender, or age (Palmore, 1990). With older adults (adults aged 65 years and above) comprising a continuously growing proportion of the population, prejudice against older adults has become a pressing dilemma in our rapidly aging society. This paper addressed the history and implications of ageism and proposed a cross-cultural comparison of ageist beliefs and attitudes between the USA and Germany. In addition, the researcher compared age estimation between both cultures, as facial age estimations tend to be bias-prone and contribute to misperceptions of age, which in turn hold the potential to increase ageist beliefs and attitudes (Clifford et al., 2018).

Rise in Population Age

The proportion of older adults in the world population is increasing. According to the Administration for Community Living (2022), the proportion of adults aged 65 years and above has steadily increased over the last century and is projected to almost double by 2060. Baby boomers, which is a term used to describe the generation of people born between 1946 and 1964 (Population Reference Bureau, 2019), make up about 73 million of America's population. By 2030, baby boomers will be at least 65 years of age, adding to the already large number of older adults numbering 54 million, as last reported by the US Census Bureau in 2019. By 2030, older adults will not only outnumber children, but 21% (one in every five residents) of the United States of America will be at least 65 years of age. By 2060, this statistic is estimated to rise to 23% (Population Reference Bureau, 2019). Not only does the aging population increase in

number, but improved longevity furthermore allows older adults to grow increasingly older. In 2019, the population of adults aged 85+ years was 53 times larger than 100 years ago (Administration for Community Living, 2022). This population shift is predicted to significantly impact America's population age structure (US. Census Burau, 2019). As a result of these changes, older people are receiving increased attention in politics and society, and questions about their well-being are becoming more important.

However, America is not the only aging nation. European countries like Germany are experiencing a similar demographic shift. The proportion of German residents aged 65 years and older has risen significantly from 12 million in 1991 to 18.3 million people in 2020. With birth cohorts falling, the total proportion of older adults composing the population has increased from 15% to 22% over the last two decades (Statistisches Bundesamt, 2022). Worldwide, the population proportion of adults aged 60 years and up is expected to double from 12 to 22%, at a faster aging pace than ever before. Changes in health and social systems are needed to accommodate major challenges expected with this increase in population age (WHO, 2022). To put these proposed changes into place, a better understanding of the impact this demographic shift has on society and the older population is warranted.

Ageism Definition, History, and Implications

Ageism is the most common experienced kind of prejudice across Europe (Abrams et al., 2011). Past literature has shown that individualistic, industrialized countries like the United States of America and Germany show greater levels of age bias and prejudice towards older adults (Ackerman & Chopik, 2020). As first defined by Robert Butler in 1975, ageism refers to the systematic stereotyping and categorizing of people based on their age. Butler, the first director of the National Institute on Aging, described ageism as another kind of prejudice and

compared it to both racism and sexism (Palmore, 1990). However, unlike other "isms," ageism is considered more socially acceptable and is the only 'ism' that all people are likely to experience at some point during their lifetime (Palmore, 2003). Ageism entails discrimination against people due to their chronological age (Butler, 2021, as cited in Goldman & Higgs, 2021), and it often includes attitudes and beliefs toward older people as well as discriminatory practices and policies against the older population (Malta & Doyle, 2016; Nelson, 2016). As ageism may show in different forms and patterns, Palmore eventually re-defined ageism and explained that this kind of prejudice can occur against any age group, and that personal or institutional stereotyping based on age can be displayed against or in favor of such age group (Palmore, 1990). This new definition now included that ageism can be displayed both negatively and positively.

Negative ageism is the least politically accepted and most vicious form of ageism (Kagan, 2008). Commonly reported examples of negative ageism against older populations include incorrect stereotypes, such as the view that people over the age of 65 years are inept to work or learn new things and should retire. Other examples of negative ageism view older adults as those who live in nursing homes, are poor, prone to injury, impotence, and bad health. Another example of such problematic stereotyping is the belief that older people tend to be angrier and often irritable. Negative ageism results in discrimination (Palmore, 1990) and can range from bigotry to psychological as well as physical abuse of older people. "Granny bashing" (another term for negative ageism) abuses older adults through vicious stereotyping and judgments that isolate the individual from the rest of the population as worthless objects of ridicule and laughter (Kagan, 2008, Mysyuk et al., 2013).

Positive ageism, on the other hand, includes stereotypes that are opposed to their negative counterparts' favorableness, which causes them to be more often overlooked or downplayed. It is

thought to be less harmful to the older population than negative ageism. Examples include the stereotypes of older people being wealthy, kind, dependable, holding increased political power, or enjoying an extensive amount of freedom. Positive ageism is often expressed in protective, parental-like terms (Kagan & Melendez-Torres, 2013). Most people display a mixture of both positive and negative attitudes toward and beliefs of older adults (Palmore, 1990).

Palmore et al. (2001) reported that 80% of the older adults in society have disclosed to have experienced some form of ageism while two-thirds of the younger population report distancing themselves from social relationships with people that are relatively older than them. Ageism may be displayed implicitly through automatic processes without conscious awareness, or explicitly with conscious control (Mohammed et al., 2019). Implicit bias is primarily observed in behaviors. These behaviors can take the form of health care professionals unconsciously changing speech patterns and engaging in "elderspeak" when communicating with older patients (Caporael, 1981) or hiring managers preferring to employ younger workers even when older candidates are more qualified (Kleissner & Jahn, 2020). Contrarily, explicit bias is often measured through self-report (Greenwald et al., 1998) and is formed when participants are asked to identify their own (limits/restrictions/"shortcomings"/etc.). An example of an explicit ageism item may ask a participant to identify how likely they would participate in a rally promoting driving restrictions for drivers past a certain age. Items may also address participants' beliefs of older adults being more reliable than younger adults or less flexible than younger co-workers (Kleissner & Jahn, 2020). When using measures of explicit bias – negative ageism in particular – influences of social desirability, political beliefs, or questionnaire wording should be considered.

While age and gender hold the potential to modulate both implicit and explicit age biases, past research on the role of both has been conflicting. Whereas Palmore reported that the

younger population is most likely to distance themselves from social relationships with people relatively older than them (Palmore et al., 2001), and Stahl and Metzger's (2013) male participants scored highest on negative ageism measures, Cherry and colleagues (2016) questioned both findings when investigating age- and gender-related differences in self-reported ageist behaviors in participants across all ages. Cherry's results indicated that adolescents and young adults showed less ageist behaviors than any other age group. Their study furthermore demonstrated that positive behaviors were more commonly reported as negative. While women endorsed positive ageism items more often than men, male and female participants did not differ significantly in reports of negative ageist attitudes (Cherry et al., 2016).

In light of the recent outbreak of the COVID-19 pandemic, during which the older population was identified as the most vulnerable and in need of protection, older adults have received increased age discrimination, ranging from blatant, hostile to benevolent, compassionate ageism (Graf & Carney, 2021). While the latter emerged out of a mixed content of age stereotypes (e.g. positive perceptions of older adults combined with attributes of incompetence or victimhood), it resulted in paternalistic and homogenizing actions while creating overresponsive environments during and after lock-downs (Cary et al., 2017; Fiske et al., 2002). COVID-19 highlighted society's misbeliefs that chronological age is the sole criterion for impairments and, as a result, placed *all* older adults at risk for COVID-19 infections, even when research showed that age alone was an unreliable measure for medical outcomes (Meisner, 2020). While younger adults across Germany and the USA celebrated Corona parties, the hashtag "Boomer Removers" trended on social media platforms (Casey, 2020; Godfrey, 2020). This stereotyping of older people only added to the increasingly growing age division of young from old and is predicted to continue even after the risks of the pandemic have passed

(Vervaecke, & Meisner, 2021). Ageism against older adults may arise due to a dread of growing old and function as an unconscious defensive mechanism against death anxiety (Bodner, 2009).

Ageist attitudes were shown to lead to a variety of health disadvantages, such as the exclusion from clinical trials for cancer (Murthy, 2004). In addition to external health threats, repeated exposure to ageism further leads to the internalization of aging stereotypes, which, in turn, causes older adults to discriminate against themselves. Self-stereotyping ageism refers to judging oneself as too old to successfully complete diverse tasks due to negative self-images of age (Levy, 2000; Levy, 2003). Self-stereotyping, negative stereotyping in particular, has been shown to elicit significant negative effects on psychological and physiological health, such as an increased mortality rate (Levy et al., 2000). In their study, Levy and colleagues found that older adults with a positive self-perception of aging lived 7.5 years longer than their counterparts with a stigmatized perception of aging. Longitudinal participants with a negative impression of aging furthermore reported worsened memory and increased cardiovascular issues (Levy, 1996; Levy, 2009). While positive stereotypes had a favorable impact on health, one explanation for the negative outcomes in adults with pessimistic aging impressions was the internalization of stereotypes, which then decreased the likelihood of participation in good health behaviors (Levy, 2004). Experiencing negative aging stereotypes furthermore led to impaired memory capabilities, an increased cardiovascular response to stress, anxiety, and ultimately a more negative perception of health leading to a decreased will to live (Levy, 1996; Levy, 2000).

In summary, previous literature has established that ageism is the most experienced prejudice across individualistic societies. Ageism might be expressed in negative or positive ways, as well as in implicit or explicit manners. It may be experienced based on beliefs and attitudes from other members of one’s society, or through self-internalization. With an increasing

rise in population age, as well as ageism's significant impacts on physical and mental health, gaining an understanding of the causes of this form of prejudice increases in importance. One marker for the likelihood of people developing ageist beliefs and attitudes towards older adults might be the perceived chronological age of others.

Age Bias in Age-Estimations

While age biases may serve as a premise for ageism and thus lead to ageist attitudes and beliefs, age biases also contribute to and shape an individual's perception of age. As older adults live longer than ever before, age diversification within societies will additionally expand (Population Reference Bureau, 2019). As such, the likelihood of more frequent, daily intergenerational interactions will increase. While research has demonstrated the benefits of constructive interactions between younger and older generations, such as the promotion of health and well-being as well as increased engagement in physical and social activities for older adults (Zhong et al., 2020), this increase in social interactions may lead to conflicts by heightened generational tension in both private and business settings (North & Fiske, 2015). Associations between chronological age and age stereotypes have been recorded in the literature. Discriminatory hiring decisions are often influenced by the activation of age stereotypes based on the job candidates' chronological age and facial appearance (Krings et al., 2011; Leopold & Rhodes, 2010). Older-looking candidates are less likely to get hired than younger-looking interviewees (Kaufmann et al., 2016).

While age estimations underpin everyday social interactions, previous research has shown that they are prone to error. Based on Clifford et al.'s 2018 study, biases account for 95% of differences in age estimations and contribute to the misperception of younger faces appearing older and older faces appearing younger. Clifford and colleagues (2018) presented participants

with standardized passport photos of males and females between the ages of 7-70 years under various masking conditions (no mask, one-third masked, half masked). If pictures were masked, a proportion of the picture was replaced with grey pixels to give the illusion of a mud-spattered glass overlay. Masking was applied to manipulate perceptual judgment uncertainty. Participants were asked to rate the pictured person's age without receiving any feedback for 348 trials (64 ages, 2 sexes, 3 levels of stimulus uncertainty). On average, age estimations were eight years off. The researchers concluded that age perception is subject to prior knowledge and immediate experiences, as participants tended to base their estimations on the age of the preceding face (Clifford et al., 2018).

Teuscher (2009) suggested a motivational as well as an information-processing approach to explain differences in subjective age. Teuscher's study sample consisted of 2000 Swiss older adults and 42 younger adults. Older participants completed a survey questionnaire assessing subjective age, health, and diverse psychographics as well as behavioral measures; while younger participants completed age ratings of 35 pictures representing adults from 30-82 years of age. Pictures were taken from a weekly journal. Ratings of participants who indicated familiarity with the pictures were excluded. Teuscher concluded two approaches to explain why subjective age across participants differed. The motivational approach assumes that age-underestimations are based on self-enhancement, which was supported by older participants estimating the age of other older adults as younger, whereas the information-processing approach led to an underestimation of one's age group due to outdated comparisons to an age prototype (older adults looking older in the past than they do nowadays). Teuscher found evidence for this approach in younger participants who estimated the age of other adults of the same age group as younger. Teuscher's image estimation procedure served as a reference for this proposed study.

In addition to differences in subjective age based on age estimations, past research indicated differences in memory for age. Individuals appeared to remember more accurately faces relative to their own age rather than faces of adults outside their age group (Anastasi et al., 2006). Anastasi and colleagues instructed participants of three age groups (young, middle, and old) to study pictures of young, middle, and older adults. Participants were then asked to complete a face recognition test. The results of this study demonstrated increased recognition effects for own-aged faces over any other faces. Even when the researchers increased the retention interval and presented different encoding tasks, the effect was replicated (Anastasi et al., 2006). This phenomenon is described as an own-age bias, which is primarily present in young rather than older adults. While younger adults tend to recognize younger relative to older faces, older adults do not tend to show any biases towards own-aged faces (Bartlett & Leslie, 1986). The own-age bias is explained by varying levels of experience with faces people accumulate over their lifetime (Fulton & Bartlett, 1991) but can be manipulated through more recent contact with people outside one's age group (Wiese et al., 2013). Wiese and colleagues (2012) demonstrated that substantial contact with persons outside of an individual's age group reduces or even eliminates own-age bias. Older adults who had significantly more contact with relatives their own age reported higher levels of own-group bias, whereas older adults with more balanced everyday interactions across generations did not (Wiese et al., 2012).

In summary, age biases have been shown to influence age estimations and age memory (Bartlett & Leslie, 1986; Anastasi et al., 2006). Experience with older adults holds the potential to modulate own-age biases, which in turn affect recognition of faces of one's own age group as compared to faces of other age groups (Wiese et al., 2013). When viewing pictures of adults across different age categories, previous research has shown that people tend to underestimate

the age of older adults (Clifford et al., 2018). The current study investigated how age biases contribute not only to errors in age perception but further predict ageist beliefs and behaviors.

To investigate cross-cultural differences in age estimation and attitudes toward older adults, a mixed model 2 (between participant culture: American, German) x 3 (within image age: young, middle, older) x 3 (between participant age: young, middle, older) between/within repeated measures design was conducted. The study contained two dependent measures, the estimated image age and the Fraboni ageism score, for all three latent dimensions of ageism (exclusion, avoidance, antilocution). Image age was analyzed as a within-subjects variable, whereas participant culture and participant age were treated as between-subjects variables. Experience and interaction with older adults were also recorded and treated as independent predictors.

The researcher predicted a main effect of image age on age estimation, such that the perceived age of actors in images would vary across their age predictions, with older adults being estimated as significantly younger than their actual age (H1). Prior research established that age estimations are error-prone and off by eight years on average (Clifford et al, 2018). Adults tend to perceive the age of younger adults as older and the age of older adults as younger (Teuscher, 2009). The researcher expected participants of this study to display a similar pattern, with a more accurate estimation of younger than older adults.

The researcher predicted a main effect of participant age on age estimation, such that age estimations of images vary across participants' ages. The researcher further predicted simple effects of participant age on age estimations, such that on average, age estimations made by younger adults were more accurate than those submitted by older adults (H2). This prediction

may be explained by own-age bias, and thus aligning with previous research demonstrating that younger adults have better memory for faces similar in age to theirs (Anastasi et al., 2006).

The researcher furthermore explored a possible two-way interaction between participant age and image age on age estimation (H3). Previous research on the two variables has been conflicting. If age estimations are driven by the own-age bias, a two-way interaction is unlikely to be found; however, if bias in age estimations occurs based on ageist believes, the researcher predicted to find evidence for a significant two-way interaction between participant age and image age. Additionally, while previous studies on own-age biases have demonstrated that younger adults have been shown to demonstrate a bias towards their own-aged peers in age estimation tasks, substantial contact with persons outside of an individual's age group reduces or even eliminates own-age bias (Bartlett & Leslie, 1986).

As the own-age bias can be manipulated through contact with people outside of one's age group and previous literature provided evidence for the moderating role of contact in own-age bias (Wiese et al., 2013), the researcher further predicted that the rating of younger participants with greater interaction and experience with older adults would estimate the age of older adults more accurately than younger adults with less interaction and experience (H4).

The researcher further predicted a main effect of participant age on the ageism subscales (H5). While previous research has been conflicting, biases toward one's own age group hold the potential to influence ageist beliefs and attitudes. As more own-age biases are present in younger adults without regular interaction with people outside their age group, the researcher hypothesized that younger adults would display greater rates of ageism on both dimensions than any other age groups (Bartlett & Leslie, 1986; and Wiese et al., 2013). In addition, viewing pictures of older adults prior to completing the ageism measure may further activate ageist

stereotypes (as displayed by Krings et al., 2011; and Leopold & Rhodes, 2010). The researcher thus aimed to manipulate age biases through image age estimations.

This study additionally compared cultural differences in age biases and ageism, as the researcher tested the effects of participant culture on both age estimation and age estimation. No prior literature has explored differences between German and American cultures, which are both individualistic cultures with similarities in the presence of both age bias and ageism. No main effect of participant culture on age estimation was hypothesized. The researcher further predicted no significant differences between the two cultures in ageism. Instead, a validation of the German translation of the Fraboni Scale of Ageism was anticipated.

Chapter 2: Method

Participants

Participants for this study were recruited via Prolific, an online on-demand research platform that enables large-scale data collection by connecting researchers with participants from 38 countries around the world. Participants were selected using a non-probability convenience sampling method. Based on the study design and variables, Prolific sample parameters were set to prescreen a total of 450 participants ($N = 450$). A total of six projects were created to recruit 75 participants per age group for each culture (young American adults: $n = 75$, young German adults: $n = 75$, middle-aged American adults: $n = 75$, middle-aged German adults: $n = 75$, older American adults: $n = 75$, and older German adults: $n = 75$). To account for potential data loss, each project recruited four additional participants in each demographic combination. The sample parameters were further set to distribute evenly to male and female participants, and participants were screened for location, age, and fluent languages. Location options included America or Germany; age options included 18–34 years for young adults, 35–49 years for middle-aged

adults, and 50–100 years for older adults. Additionally, participants were screened for the following two language options: English and German. A power analysis using a medium effect size with the alpha level set at .05 for a one-tailed repeated-measures design with a within-between interaction suggested a sample size of 175 participants (total $N = 175$) to achieve a sufficient power value of .80. The researcher aimed for a larger sample size to ensure adequate power.

The researcher recruited a total of 492 participants through Prolific.co. As a completion rate of 100% was set as a requirement for a complete case analysis, six participants had to be excluded from the final analysis due to low survey completion rates (< 15%). In addition, three participants were removed due to failed attention checks (these participants were unable to repeat the instructions for the age estimation task and were removed from the data based on inattention). Upon data cleaning, a final sample size of N = 483 was used in the analysis.

Descriptive analyses of demographic information were conducted using the Statistical Package for Social Sciences, version 27.0 (SPSS IBM Corp). Frequency analysis revealed that 46.6% of participants identified as male, 50.8% as female, and 1.2% as non-binary. 1.0% of the sample preferred not to indicate their sex. Out of the total of 486 participants, 55.1% reported being American ($n_{\text{American}} = 268$), 35.4% were German ($n_{\text{German}} = 172$), 6.6% identified as other, and 2.7% preferred not to indicate their culture. The mean age of all participants was $M = 42.29$ years, ranging from 18-80 years ($SD = 15.11$). 274 participants completed the survey in the English language, and 209 participants completed it in German (see Table 1).

Out of the 274 English-speaking participants, 83.6% were Caucasian, 20.6% Multi-Ethnic, 4.4% African American, 4.4% Hispanic, 1.8% East-/Southeast-Asian American, 1.5% South-Asian American, .7% American Indian/Native American, .4% Pacific-Islander American,

.4% Caribbean American, and.4% identified as other. Of the 211 German-speaking participants, 88.5% were EU-European, 3.3% Non-EU-European, 2.4% Multi-Ethnic, 1.9% Asian, 1.9% American, 1.4% African, and .5% identified as other (see Table 2).

After categorizing participants by age (young, middle, old) and culture (American, German), the sample consisted of fewer German older participants, as the Prolific.co sample pool was proportionally smaller. To balance the lower participation by older German adults, the researcher recruited 31 additional American older adults. Of the total 274 Americans, 31% were young (nAmYng = 85), 28.5% were middle-aged (nAmMddl = 78), and 40.4% were old (nAmOld = 111). Out of the 209 German participants, 40.7% were young (nGerYng = 85), 44.5% were middle-aged (nGerYng = 93), and 14.8% were old (nGerOld = 31). When grouping participants by age only, 35.2% of the combined 483 Americans and Germans were young, 35.4% middle-aged, and 29.4% older, representing an overall balanced sample (see Table 3). 45 participants were excluded from cultural analyses for age estimations, as they identified with other cultures than American or German culture or preferred not to indicate their cultural identity.

Materials and Measures

Images

For this study, only pictures of white, male actors were presented. Actors were chosen, as their publicly available demographic information allowed the researcher to validate the age of the person in the image. While unrecognizable stock pictures would have eliminated a recognition effect, these types of pictures would not have allowed for the calculation of difference scores between actual age and age estimation. Stock images would have thus

prevented the testing of age estimation errors. By choosing actors with accessible demographic information, the researcher was able to calculate differential scores for data analytical purposes.

To reduce the impact of other variables, such as celebrity gender, race, or ethnicity, only white males were presented. Males were chosen to reduce the presence of aesthetic facial surgical procedures and other youth-enhancing beauty regimen that alter someone's natural aging process. These treatments hold the potential to influence age appearance and skew participants' age estimations. A study by Chauhan and colleagues (2012) demonstrated that participants were more likely to estimate an individual's chronological age younger after a person had undergone surgical procedures, such as face, forehead and neck lifts, as well as upper and lower blepharoplasty (excess eyelid removal). Surgery patients were estimated to be 8.9 years younger than their actual, chronological age. On average, the more procedures someone had undergone, the more likely their age got underestimated (Chauhan et al., 2012).

While men may be subject to plastic surgery as well, the American Society of Plastic Surgeons revealed in their 2020 plastic surgery statistics report that women account for 92% of cosmetic procedures, while men only account for 8% of the total of 15.6 million cosmetic procedures. 40–54-year-old adults composed the majority of cosmetic surgery patients, with face-altering procedures such as eyelid surgery, facelifts, and soft tissue fillers, as well as laser peels and Botox injections, which both reduce and eliminate wrinkles and fine lines being amongst the top requested surgeries (ASPS, 2020). As facial aging is often associated with and predicted by sagged tissue, deeper folds, wrinkles, a flatter face, and less visibility of the eyes (Windhager et al., 2019), it is evident that aesthetic facial surgical procedures influence a person's youthful appearance and lead to misperceptions of age.

In addition to accounting for and reducing the influence of appearance-altering procedures on age estimations, the researcher chose to display only white males in the proposed study so as to represent the majority of racial and ethnic groups in both America and Germany. While both countries represent a large ethnic and racial diversity and include a rich cultural diversion, their diversity index differs in population composition. The United States Census Bureau estimates that white people contribute to the majority of the race population with 75.8% prevalence. The white alone population is followed by Hispanic/Latino residents at 18.9% and Black/African American residents at 13.6% of the overall population percentage (US Census Bureau, 2021).

Germany, following World War II, no longer collects demographic information based on race. However, reports based on nationality show that 26.7% of the overall German population has an immigration background. A majority of immigrants are Turkish (12.4%), Polish (7.4%), and Syrian (7.4%). While African Germans contribute to 5.5% of Germany's overall immigrant population, Hispanic populations are not represented as their own ethnic group and instead contribute to the 10.5% of other nationalities (Destatis, 2021). This difference in population representation makes a cross-cultural comparison of age estimation beyond the primarily white population and across multiple racial and ethnic divisions extremely difficult. Future replications of this study aim to include more diverse measures.

Pictures of actors who were included in the study had to fulfill additional criteria. The image had to be taken recently to display the actor's current age accurately. Only actors with no recent media involvement or increased representation (e.g., scandals, nominations for awards, or new film releases) were included in the study. Additionally, the pictures used displayed actors in natural lighting and realistic situations, such as red-carpet events. Pictures posted by a celebrity's

publisher or taken during movie scenes and thus displaying actors in costume were avoided, as these may have been heavily edited or taken in ways that enhance younger-looking appearances through lighting and positioning. Actors had to face the camera and their faces needed to be clearly visible.

Age Estimation Task

Participants were presented with 12 pictures of white, male celebrities. Four pictures displayed young adults, four pictures presented middle-aged adults, and four pictures showed older adults. Each age group was composed of two American actors and two German actors, adding up to a total of six American and six German celebrities (see Appendix A for actors' names and ages). Pictures were displayed individually and in random order. After viewing each picture, participants were instructed to guess the age of the celebrity and indicate their best guesses in the textbox below the picture. During each of the 12 age estimation tasks, participants were able to review the picture before indicating their age estimation, as the estimation textbox was displayed under the picture. Estimation prompts were not timed.

After each age estimation, participants were asked to indicate if they recognized the pictured male. If a participant recognized a celebrity, they were further instructed to indicate how accurately they knew the age of the actor on a three-point scale. Answer options varied from exactly, to approximately, to not at all. If participants did not recognize the actor, a skip logic instead displayed the next picture. Recognition measures were inspected and considered unimportant, as none of the participants who recognized an actor indicated exact knowledge of their actual age. Participants guessed the age of a total of 12 men. After completion of the age estimation task, participants were asked to rate their subjective, overall estimation accuracy on a 6-point Likert-type scale, ranging from no accuracy to excellent accuracy.

Fraboni Scale of Ageism (FSA, Fraboni et al., 1990)

The Fraboni Scale of Ageism, developed by Fraboni, Saltstone, & Hughes in 1990, is a multidimensional measure of ageism. The 29-item scale assessed three dimensions of ageism: avoidance, discrimination, and antilocution. Participants responded on a 4-point Likert-type scale, ranging from strongly disagree to strongly agree. Total scores ranged from a minimum score of 29 to a maximum score of 116. Higher scores indicated a greater presence of ageism, while lower scores represent less ageist beliefs and attitudes. Items 8, 14, 21, 22, 23, and 24 were positively worded and thus reverse-scored. The Fraboni scale of ageism had been validated with a Cronbach's α coefficient of 0.86 (Fraboni et al., 1990; see Appendix B). Example items of the scale include "*Teenage suicide is more tragic than suicide among the old," "I sometimes avoid eye contact with old people when I see them,"* and *"Most old people should not be allowed to renew their driver's licenses."*

In addition to the original scale, which was presented to English-speaking and reading participants, the researcher translated the FSA from English to German. A forward-backward inspired method of translation was applied (Gjersing et al., 2010), in which the bilingual researcher translated original items into German and used an online translation tool (Google Translate) to convert the German items back into English. Both translations were then compared and adjusted accordingly to conclude the final translation (see Appendix C). A factor analysis was conducted to validate the psychometric properties of the translated scale. Future research might compare the German translation to other translations of the FSA, which include Turkish (Kutlu et al., 2012), Chinese (Fan et al., 2020), and Italian (Donizzetti, 2019) translations.

Interaction and Experience with Older Adults, Demographic Information

Interaction and experience with older adults were recorded, as both measures were analyzed as possible independent predictors of ageism. Demographic variables, which included participant age, gender, and culture were also recorded as possible as mediators (see Appendix D for the interaction and experience measures).

Procedure

Prolific participants that satisfied the prescreening criteria (location, age, and fluent language) were presented with the study title "Guess my Age" (German version: "Wie alt schätzen Sie mich?"), a brief description of the study, the compensation rate ($2.40), and the expected time commitment (15 minutes). Prolific's pre-programming displayed the study only to prospective participants that were eligible and automatically distributed the study evenly across male and female samples. Interested participants were directed to the study following a Qualtrics link.

Upon providing informed consent, each participant's Prolific ID number was recorded. Any Prolific worker holds a unique ID, which enabled the researcher to anonymously match participant demographics and answers with submission quality reports. Participants were then presented with the following instructions:

"You will now be presented with 12 pictures of male celebrities. Please view every picture individually and indicate your best guess of each man's age in the text box below. Please type the age numerically and hit the arrow in the lower right-side corner of your screen to be presented with a recognition measure before the next image will be displayed. We kindly ask you not to use any outside sources in order to research the actual ages of the actors, but rather to view this as a fun challenge with courage to misjudgment."

The instructions were then followed by the first attention check, a multiple-choice question that asks participants to select which task they were instructed to perform. Upon selecting the correct response, participants were presented with pictures of the 12 celebrities in random order. For each picture, participants had to estimate the age of the displayed celebrity and then indicate if they recognized the celebrity. If "yes" was selected, participants indicated how accurately they knew of the age of the celebrity, with answer options ranging from exactly, to appropriately, to not at all. If participants did not recognize the celebrity, a skip logic presented them with the next picture. After 12 estimations, participants were asked to report the accuracy of their guesses by moving a slider between no accuracy to excellent accuracy.

Participants then respond to the 29-item, 4-point, Likert-type, Fraboni Scale of Ageism, which measured ageist attitudes and beliefs on three dimensions: avoidance, discrimination, and antilocution. Post-completion of the scale, participants responded to a brief interaction and experience measure, in which they indicated how experienced they were in interacting with older adults (65+) and how often they interacted with older adults. Participants were able to answer on a 5-point Likert scale ranging from very inexperienced to extremely experienced for the experience and very rarely to very often for the interaction measure. Lastly, participants were asked to provide demographic information, including sex, age, ethnicity, birth country, residence, and culture.

After the debriefing, which displayed the purpose of the study and contact information of the research team to participants, they were presented with the option to view the name and age of each celebrity picture used in the age estimation task. Participants were then automatically redirected to the Prolific homepage. Upon completion of the survey, participants were compensated for the percentage of the study they completed. Based on the participant's language

screening qualification, they were presented with the survey in English or German. Completion of the survey was expected to take approximately 15 minutes. On average, participants took 9.22 minutes to complete the survey (M = 9.22, SD = 4.78).

Chapter 3: Results

Descriptive Statistics

Difference scores for age estimations (actors' actual age – participants' guess) were created and ranged from -13.5 to + 5.92 years. Participants underestimated the age of the pictured actors by 3.00 years on average (M = -3.00, SD = 2.93). On the self-reported measure of belief in image age accuracy, participants averaged a mean score of M = 46.38 (ranging from 0 = no accuracy to 100 = excellent accuracy), indicating that they believed to be correct on image age estimations less than 50% of the time. In addition, when asked to report their interaction frequency and experience rating with older adults, participants reported a mean score of 3.46 on the interaction measure (1= very rarely, 5 = very often; SD = .94) and a mean score of 3.41 on the experience measure (1 = very inexperienced, 5 = extremely experienced; SD = 1.03).

Descriptive statistics on the FSA revealed a mean score on the discrimination factor of 1.71, ranging from 1.0 to 3.0 (1 = strongly disagree (least ageist), 4 = strongly agree (most ageist); SD = .38). The avoidance factor had a mean score of 1.97, ranging from 1.0 to 3.22 (SD = 0.43). The mean score for antilocution was 2.13, ranging from 1.0 to 2.93 (SD = 0.4). Overall, participants' FSA scores ranged from 1.0 to 1.94, with a mean score of 1.94 and SD = .35.

Primary Analysis

Effects of Image Culture on Age Estimations

To detect differences in age estimations for images of American and German actors, a 2 (image culture) x3 (image age) mixed-model repeated-measures analysis of variance (ANOVA)

was conducted. Mauchly's Test of Sphericity indicated that sphericity was violated for image age effects, $W(2) = .92$, $p < .001$, and image culture, $W(0) = .99$, thus the Greenhouse-Geisser correction is reported. The model indicated significant main effects of image age on age estimations, Wilks' Lambda = 1.17, $F(1.85,807.12) = 1315.38$, $p < .001$, $\eta^2_p = .75$; and image culture on age estimations, Wilk's Lambda = .23, $F(1,437) = 1452.03$, $p < .001$, $\eta^2_p = .78$. The interaction between image culture and image age was also significant, Wilk's Lambda = .345, $F(2,874) = 373.94$, $p < .001$, $\eta^2_p = .46$ (see Figure 3). While paired sample t-tests revealed no significant differences in age estimations for images of young American and German actors, $t(437) = -.30$, $p = .732$, $d = -.01$, paired sample t-tests investigating mean differences between middle-aged American and Germans, as well as old American and German actors, revealed significant differences. Images of middle-aged Americans and Germans differed in their age estimations, $t(437) = -30.18$, $p < .001$, $d = -1.44$, such that on average, the age of American actors were overestimated by 3.14 years ($M = 3.14$, $SD = 5.06$), while the ages of Germans were underestimated by 4.78 years ($M = -4.78$, $SD = 4.68$). Images of old American and German actors further differed in their age estimations, $t(437) = -31.55$, $p < .001$, $d = -1.51$, such that on average, the age of American actors were underestimated by 5.41 years ($M = -5.41$, $SD = 4.87$), while the ages of Germans were underestimated by 13.06 years ($M = -13.06$, $SD = 5.51$). Change scores are listed in raw units in Table 4 (for absolute values, see Table 5). Based on these significant differences in age estimations by image culture, the researcher separated the following analysis by image culture (American, German).

Hypothesis 1. The researcher predicted a main effect of image age on age estimations, such that the accuracy of age estimations in images will vary across their image age category (young, middle, old). The researcher further predicted simple effects of image age categories on

age estimations for both American and German images, with older adults being estimated as significantly younger than their actual age and younger adults being estimated more closely to if not over their actual age. To test the effects of image age on age estimations, a mixed-measures repeated-measures model ANOVA for both American and German images was conducted.

The analysis of American images indicated a significant main effect of image age (young, middle, old) on deviation scores of age estimations, Wilk's Lambda = .32, $F(2,864) = 479.38$, $p < .001$, $\eta^2_p = .53$, indicating that age estimations differed on at least two levels of the image age variable (see Table 6 and Figure 5). Pair-wise comparisons were conducted using paired-sample t-tests. The mean deviation score for young images (M =1.14, SD = 3.39) was significantly lower than the mean deviation score for middle-age images (M = 3.14, SD = 5.06), $t(437) = 7.72$, $p < .001$, $d = .37$. The mean deviation score for estimations of young-age images were further significantly higher than the mean deviation score for old-age images (M = -5.41, SD = 4.87), $t(437) = 23.58$, $p < .001$, $d = 1.13$. The mean deviation score for estimations of middle-aged images was significantly higher than the mean deviation score for old-age images, $t(437) = -32.52$, $p < .001$, d = -1.55 (see Figure 3).

In addition to analyzing actual raw change scores, the researcher conducted supplementary ANOVAs using absolute change values to capture the absolute distance between actual age and age estimations without the possibility of negative and positive values averaging to zero, thus reporting more generalizable results. Tests of the main effect of image age for American images reached significance for absolute values, $p < .001$ (see Table 8).

In the analysis of the effect of image age on age estimations for German images, Mauchly's Test of Sphericity indicated that sphericity was violated, $W(2) = .95$, $p < .001$, thus the Greenhouse-Geisser correction is reported. The model demonstrated a significant main effect of

image age (young, middle, old) on deviation scores of age estimations, Wilk's Lambda = .17, $F(1.9,864) = 1134.25$, $p < .001$, $\eta^2_p = .72$, indicating that age estimations differed on at least two levels of the image age variable (see Figure 5 and Table 7). Pair-wise comparisons were conducted using paired-sample t-tests. The mean deviation score for young images (M =1.08, SD = 3.81) was significantly higher than the mean deviation score for middle-age images (M = -4.78, SD = 5.06), $t(437) = 24.29$, $p < .001$, $d = 1.16$. The mean deviation score for estimations of young-age images was further significantly higher than the mean deviation score for old-age images (M = -13.06, SD = 5.51), $t(437) = 47.29$, $p < .001$, $d = 2.26$. The mean deviation score for estimations of middle-aged images was significantly higher than the mean deviation score for old-age images, $t(437) = 30.3$, $p < .001$, d = 1.45 (see Figure 3).

In addition to analyzing actual raw change scores to demonstrate directional differences in age estimations, the researcher conducted supplementary ANOVAs using absolute change values to capture the absolute distance between actual age and age estimations without the possibility of negative and positive values averaging to zero, thus reporting more generalizable results. Tests of the main effect of image age for German images reached significance for absolute values, $p < .001$ (see Table 9).

Hypothesis 2. The researcher predicted a main effect of participant age on age estimation, such that age estimations of images vary across participants' ages. The researcher further predicted simple effects of participant age on age estimations for American and German images separately, such that on average, age estimations made by younger adults were more accurate than those submitted by older adults. The model of American images revealed no significant main effect of participant age on deviation scores of age estimations, $F(2,432) = .761$, p = .468, $\eta^2_p = .00$, indicating that differences in age estimation accuracy could not be expected

based on participants' ages (see Table 6). Tests of the main effect of participant age for American images using absolute values on the other hand reached significance, $p < .001$ (see Table 8).

The model of German images demonstrated a significant main effect of participant age on deviation scores of age estimations, $F(2,432) = .4.76$, p = .009, $\eta^2_p = .02$, indicating differences in age estimation accuracy were based on participants' ages (see Table 7). Multiple post-hoc comparisons using Tukey's HSD revealed a marginally significant mean difference in age estimation between young and middle-aged participants (*MD* = -.91, *SE* = .39), $p = .051$, d = XXX 95% C.I. = [-1.65, .04] and a significant mean difference in young and old participants (*MD* = -1.24, *E* = .40), $p = .005$, d = XXX95% C.I. = [-2.04, -.27]. Simple comparisons of age estimations by middle-aged and old participants were not statistically significant, $p = .619$ (see Figure 6).

Tests of the main effect of participant age for German images using absolute values, on the other hand, reached significance, $p < .001$, $\eta^2_p = .03$ (see Table 9).

Hypothesis 3. In addition to the main effects of image age and participant age on age estimations, the researcher predicted a significant two-way interaction between image age and participant age on age estimation, such that younger adults would estimate the ages of young actors (actors in their age category) more accurately than those of old actors (images outside of their age category). Based on prior research on age bias, old participants were not predicted to show a bias toward old images (images within their age category).

The model of American images revealed a significant two-way interaction, Wilk's Lambda = .98, $F(4,864) = 2.5$, $p = .041$, $\eta 2_p = .0.1$ (see Table 6; see Figure 5). As predicted, young participants estimated the ages of young actors significantly more accurately than those of

old actors, $p = .005$. Additionally, the mean difference in age estimations between young actors and middle-aged actors was marginally significant, $p = .053$ (see Table 4 for change scores). Tests of the interaction effect between image age and participant age for American images using absolute values, on the other hand, did not reach significance, $p = .87$ (see Table 8).

The model of German images further revealed a significant two-way interaction, Wilk's Lambda = .97, $F(3.81,826.13) = 3.97$, $p = .004$, $\eta^2_p = .02$ (see Table 7, see Figure 6). As predicted, young participants estimated the ages of young actors more accurately than those of old actors, and, similar to American images, older adults were also more accurate in age estimations for younger (outside of their own age group) than for older images (within their age group). Tests of the interaction effects between image age and participant age for German images using absolute values reached significance as well, $p = < .001$ (see Table 9).

Hypothesis 4. The researcher predicted that interaction and experience with older adults would predict the accuracy of age estimations, such that young participants with greater interaction and experience would show greater image age accuracy. A bivariate correlation analysis using the Pearson correlation coefficient (Pearson's *r*) revealed a significant positive correlation between experience and interaction measures, $r = .66$, $p < .001$, indicating that increased interaction with older adults was associated with greater experience. In addition, absolute mean difference scores of age estimations for old American images by young participants were negatively correlated with interaction measures, $r = -.28$, $p < .001$, and experience measures, $r = -.18$, $p < .001$. Absolute mean difference scores of age estimations for old German images by young participants were also negatively correlated with interaction measures, $r = -.16$, $p = .05$, and experience measures, $r = -.23$, $p = .004$, thus indicating that

greater interaction and experience with older adults were associated with greater accuracy in age estimations of older images (for the full correlation matrix, see Table 10).

To test whether increased experience and interaction with older adults predicted increased accuracy in age estimations of older adults, a multiple linear regression for both old American images and old German images was conducted. The model for American old images revealed a significant regression equation, $F(2,149) = 6.29$, $p = .002$, $R^2 = .08$. Only interaction measures were significant predictors for age estimation accuracy, with interaction measures increasing by 1.27 units on the Likert scale for decreases in absolute change scores for age estimation, $p = .005$. The model for German old images revealed a significant regression equation, $F(2,149) = 4.28$, $p = .016$, $R^2 = .05$. Here, only experience measures were significant predictors for age estimation accuracy, with experience measures increasing by 1.21 units on the Likert scale for decreases in absolute change scores for age estimation, $p = .034$ (see Table 11).

Hypothesis 5. Proceeding from analyses of age estimations to ageism measures, the researcher predicted a main effect of participant age on each of the ageism subscales (antilocution, avoidance, discrimination). A bivariate correlation analysis using Pearson's *r* revealed significant correlations between participant age and the discrimination subscale, $r = .23$, $p < .001$, the avoidance subscale, $r = -.32$, $p < .001$, and the antilocution subscale, $r = -.20$, $p < .001$, indicating that as participant age increased, agreement with avoidance and antilocution items on the FSA decreased. Agreement with discriminatory items, however, seemed to correlate with increases in age (for a full correlation table, see Table 12). Multiple linear regression models were conducted to test whether age predicted ageism on each of the subscales. The model for discrimination revealed a significant regression equation, $F(1,484) = 24.73$, $p < .001$, $R^2 = .05$. Participant age was a significant predictor for discrimination and increased discrimination

minimally by .004 units on the scale, p < .001. The avoidance model revealed a significant regression equation, $F(1,484) = 49.83$, $p < .001$, $R^2 = .10$. Participant age was a significant predictor for the avoidance subscale and decreased avoidance minimally by .007 units on the scale. The model for antilocution revealed a significant regression equation, F(1,484) = 17.59, p < .001, $R^2 = .04$. Participant age was a significant predictor for the antilocution subscale and decreased avoidance minimally by .005 units on the scale (see Table 13).

Additional Analysis

Tests for Effects of Participant Culture on Age Estimations

No prior literature has explored the differences in the prevalence of age bias and ageism between German and American cultures, which are both individualistic cultures with similarities in the presence of both biases and isms. No differences in age estimation and thus age bias were hypothesized. To test whether differences might be present, the researcher performed a repeated measures model. No significant main effect in age estimations of young, middle, and old adults between American and German participants were found, Wilk's Lambda = .18, $F(1,438) = .13$, $p = .72$, $\eta^2 p = .00$, indicating that both cultures overestimated the ages of younger adults and underestimated the ages of older adults similarly (see table 15, see graph 8). Similar, non-significant results were demonstrated when testing for age estimation differences with absolute values (see Table 16, see Graph 9).

Tests for Effects of Participant Culture on Ageism Measures

The researcher further investigated cultural differences in ageism measures between American and German participants. The researcher conducted a repeated measures ANOVA to test for differences in the ageism subscales. Mauchly's Test of Sphericity indicated that sphericity was violated, $W(2) = .85$, $p < .001$, thus the Greenhouse-Geisser correction is reported.

The interaction between ageism subscales and culture was significant, $F(1.79,784.71) = 18.36$, $p < .001$, $\eta^2 p = .04$, indicating that ageism subscale means differed between cultures (see Table 14, see Figure 7). The model further demonstrated a significant main effect of culture on ageism, $F(1,438) = 5.50$, $p = .019$, $\eta^2 p = .01$, indicating ageism measures were different based on participant culture.

Simple effects revealed significant differences between American and German participants in ageism mean scores on all three subscales. While Germans scored statistically significantly lower on discrimination measures ($M = 2.31$, $SD = .23$) than Americans ($M = 2.40$, $SD = .25$), $F(1,438) = 15.35$, $p < .001$, $d = .03$; German participants indicated higher avoidance measures ($M = 2.34$, $SD = .35$) than American participants ($M = 2.22$, $SD = .33$), $F(1,438) = 13.85$, $p < .001$, $d = .03$; and higher antilocution measures (M = 2.19, SD = .38) than the American sample ($M = 2.06$, $SD = .40$), $F(1, 438) = 10.40$, $p = .001$, $d = .02$ (see Table 15).

Psychometric Analysis of the Fraboni Scale of Ageism and the German Translation

Reliability for the original scale and the translated scale was calculated using Cronbach's alpha. Using Fraboni et al.'s (1990) suggested three subscales of discrimination, avoidance, and antilocution, reliability was calculated for each subscale separately. The English discrimination subscale had a moderate reliability, $\alpha = .72$, and consisted of 6 items (18, 21, 17, 24, 23, and 20). The antilocution subscale of the English FSA had a high reliability, $\alpha = .82$, and consisted of 9 items (19, 15, 26, 13, 6, 7, 14, 11, and 10). The English antilocution subscale consisted of 10 items (28, 5, 3, 4, 29, 9, 1, 25, 27, and 16) and had high reliability, $\alpha = .78$. For the German translation of the scale, the suggested discrimination factor had low reliability, $\alpha = .66$, the avoidance subscale had moderate reliability, $\alpha = .73$, and the antilocution factor had a reliability of $\alpha = .96$ with 9 items.

Consistent with prior research, a confirmatory factor analysis (CFA) using maximum likelihood extraction using the Statistical Package for Social Sciences, version 27.0 (SPSS IBM Corp) confirmed the three-factor model for the original scale proposed by Fraboni et al. (1990), X^2 (322, N = 275) = 478.57, p < .001. The three factors account for 34.86% of the variance. Factor 1 explained 27.37% of the total variance and consisted of 12 items (15, 21, 13, 7, 26, 26, 24, 6, 12, 23, 11, and 10). Factor 2 accounted for 4.17% of the total variance and was comprised of 6 items (5, 3, 28, 1, 19, and 2). Lastly, the third factor explained 3.33% of the total variance and included 11 items (17, 8, 18, 14, 20, 9, 16, 22, 25, 27, and 29). The Kaiser-Meyer-Olkin measure of sampling adequacy was .91, which demonstrates that the sample size was adequate to carry out the factor analysis. Additionally, the value for Bartlett's test of sphericity was 2650.31, with p =.000 (see Figure 11 for the scree plot).

A confirmatory factor analysis (CFA) using maximum likelihood extraction was also performed on the German translation of the scale. Consistent with other translations of the FSA, the CFA confirmed the three-factor model for the German translation, X^2 *(322, N = 211) = 478.57, p < .001*. The three factors account for 28.17% of the variance. Factor 1 explained 19.29% of the total variance and consisted of 14 items (3, 24, 4, 28, 9, 29, 14, 5, 27, 19, 10, 12, 18, 17, 2, and 1). Factor 2 accounted for 5.87% of the total variance and was comprised of 4 items (7, 6, 13, and 15). Lastly, the third factor explained 3.01% of the total variance and included 8 items (26, 21, 22, 24, 23, 16, 20, and 8). The Kaiser-Meyer-Olkin measure of sampling adequacy was .83, and the value for Bartlett's test of sphericity was 1634.91, with p < .001 (see Figure 12 for the scree plot).

To determine the structural validity of both the original scale and the translation, as well as the number of latent constructs, an exploratory factor analysis using principal component

analysis (PCA) was conducted. A direct oblimin rotation was performed with the original 29 items of the English and the German translation of the scale.

The initial English and German factor analysis indicated 8 factors for the original scale, all accounting for a total of 57.04% of the variance. Multiple items were cross-loading among more than one factor or were double-barreled, thus indicating decreased reliability. These were removed and the factor analysis was subsequently run several times until all items only loaded onto one factor.

After seven iterations and the removal of the cross-loaded items, the English version of the FSA consisted of 3 factors (avoidance, stereotypes, and exclusion), with a total of 16 items accounting for 51.75% of the total variance explained. The avoidance factor accounted for 34.21% of the total variance and consisted of seven items (15, 13, 21, 26, 7, 24, and 6). Example items included "I personally would not want to spend much time with an old person" and "I would prefer not to live with an old person." The avoidance factor had strong reliability, $\alpha = .86$. The stereotype factor contributed 9.02% of the total variance; consisted of three items (4, 3, and 5); and had moderate reliability, $\alpha = .72$. Example items included "Many old people are stingy and hoard their money and possessions," and "Many old people just live in the past." Lastly, the exclusion factor accounted for 8.53% of the variance and was comprised of six items (17, 8, 9, 14, 20, and 16) with a weak reliability, $\alpha = .67$. Example items for this factor included "Old people don't deserve the same rights and freedoms as do other members of our society," and "Most old people should not renew their driver's license." The Kaiser-Meyer-Olkin measure of sampling adequacy was .89, which demonstrates that the sample size was adequate to carry out the factor analysis. Additionally, the value for Bartlett's test of sphericity was 1234.38, with $p < .001$ (for scree plot and factor loadings see Figures 13-14).

Similar to the original version of the scale, the German translation of the FSA indicated 8 factors during the initial analysis, thus accounting for 56.78% of the total variance. Items that were cross loading amongst factors, double-barreled, or decreased reliability were removed.

After five iterations, the German translation of the FSA consisted of three factors (avoidance, stereotypes, and exclusion), with a total of 12 items accounting for 57.13% of the total variance explained. The avoidance factor accounted for 36.09% of the total variance and consisted of 5 items (7, 15, 6, 13, and 26). Example items This factor had strong reliability, $\alpha = .80$. The stereotype factor contributed to 11.20% of the total variance and consisted of three items (4, 3, and 5) and had weak reliability, $\alpha = .62$. Lastly, the exclusion factor accounted for 9.85% of the variance and was comprised of 4 items (17, 14, 9, and 12), with a weak reliability, $\alpha = .66$. The Kaiser-Meyer-Olkin measure of sampling adequacy was .87, which demonstrates that the sample size was adequate to carry out the factor analysis. Additionally, the value for Bartlett's test of sphericity was 923.00, with $p < .001$ (for scree plot and factor loadings see Figures 15-16).

Comparing factor loadings between the English and the German version of the scale, items loaded similarly into factors for both samples and abbreviated versions of the scale, as suggested by PCAs, and may be used in future research with both populations.

Chapter 4: Discussion

Summary of Results

The researcher found significant differences in age estimations of young and older images, and thus provided support for a main effect of image on age estimations. These differences in age estimations were found even when using absolute scores. The results of this study were consistent with prior literature stating that the age of young adults is often overestimated whereas the age of older adults is on average underestimated (Clifford et al.,

2020). Differences in age estimations between younger and older images might further be explained by Teuscher's information-processing approach (2009). When participants compared recent images of older actors (who were most likely styled and groomed according to modern fashion) with outdated prototypes, these no-longer accurate expectations of what an "old man" is supposed to look like potentially contributed to the significant underestimation of older adults ages, particularly when an actor did not represent the stereotypical image of an old person. The researcher also replicated age-estimation errors and demonstrated that age estimations of a pictured adult on average differ significantly from the pictured person's actual age.

The predicted main effect of participant age on age estimation was partially supported. The own-age bias, as cited by Anastasi and colleagues in 2006, likely contributed to younger adults' estimation of the ages of younger images more accurately. Recognizing the facial features of peers and showing increased retention for own-aged faces likely motivated younger adults to guess the ages of younger images closer to the actor's actual age. As the own-age bias has not been demonstrated for older adults, no biases were present in the older participants of this sample (Anastasi et al., 2006; Bartlett & Leslie, 1986). While differences between American and German participants were found, it has yet to be determined if those were caused by measurement error or cultural variability.

The current study further provided evidence for a significant two-way interaction between participant age and image age on age estimations. However, this finding requires future research to predict where differences fall and thus isolate factors that drive age bias and ageism.

Consistent with the work of Wiese et al. (2013), interaction and experience with older adults was partially shown to predict increases in age estimation accuracy. The researcher found that participants with higher experience and/or interaction ratings demonstrated lower rates of

ageism. However, cultural differences between American and German participants determined whether interaction or experience was the driving force to reduce ageism.

In addition, a main effect of participant age on ageism was demonstrated. Younger adults were, on average, more likely to demonstrate ageist beliefs and behaviors than middle-aged and older adults. While previous research of the role of age and gender on ageism has been conflicting (Palmore, 2001, Cherry et al., 2016), biases toward one's own age group hold the potential to influence ageist beliefs and attitudes. As own-age biases are usually present in younger adults with less interaction with people outside their age group, the researchers' findings align with previous research on own-age bias (Bartlett & Leslie, 1986; and Wiese et al., 2013). Differences on ageism subscales demonstrated higher avoidance and antilocution ageism in young adults, while older adults were more likely to engage in discriminatory practices and beliefs. Levy's self-stereotyping hypothesis (2000) might explain the increase in discriminatory practices amongst older participants.

Overall, no significant differences between cultures on age estimations were found, and the researcher's results showed that differences were more prevalent in image cultures rather than participant cultures. Older German images were estimated to be significantly younger than American images. This may be due to the inaccurate representation of older adults due to the pictures used in this study. While no differences in age estimations were present, the researcher confirmed differences in ageism measures between cultures. German participants demonstrated higher rates of avoidance and antilocution, while American participants reported a higher presence of discriminatory ageism. As both the USA and Germany are industrialized countries with higher rates of ageism (Ackerman & Chopik, 2020), the presence of ageism came as no surprise. However, cultural differences in the presence of ageism subtypes might need further

investigation. This study furthermore first translated the FSA into German and used it on a German-speaking population.

Strengths and Limitations

A major strength of this study was the access to a large and age-diverse population sample, thus allowing for demographic variables in the final data set to be almost evenly distributed. In addition, this study was the first to use a German translation of the FSA scale and to demonstrate similar factor loadings between original FSA and translation. In contrast to the researcher's prediction, however, the designed age estimation task did not serve as a premise for ageism. The age estimation task itself further showed weaknesses in its design, as paired-sample t-tests revealed significant differences in age estimations between the two image cultures for middle-aged old adults, thus resulting in separate analyses between the cultures. Additional weaknesses of the current study included the non-verified German translation of the scale and the generally questionable replicability of the scale.

Future Directions

In order to increase validity and replicability, future research may employ different pictures to prevent significant differences in age estimations between image cultures. Using pictures of lesser-known TV personas from a different culture than the participant's culture might also aid with the recognition effect, which may have skewed the results of the present study. In addition, more diverse images should be used to be able to generalize findings of age bias for adults beyond using images of only white, male adults.

While differences in age estimations were replicated in this study, differences in age estimations did not predict performance on the ageism measure. A bivariate correlation analysis revealed a non-significant relation between age estimations and FSA subscales, $ps < .005$. Thus,

age estimations may not be used as an indicator of ageism. Measures of this study, such as the task to estimate the age of an image precisely versus the completion of the rather broad ageism scale with latent factors invented by Fraboni et al. (1990), might have been too distal to detect correlations with each other. Future research might employ a different measure of ageism or use alternative manipulations to induce age bias in participants.

Future research might also invest cultural differences in ageism measures. It is unclear if differences between both cultures might be explained by translation errors, the distal scale, or potential differences in expression or vocalization of ageist behaviors, which could contribute to mean differences on the FSA subscales between American and German samples. In addition, future studies might also expand the sample to cultures that have been reported to be lower in ageism in order to investigate potential motivations behind ageism and means to reduce its occurrence. Lastly, future studies should investigate the roles of interaction and experience with older adults further and treat both variables as co-varieties.

In addition, to further validate the construct validity of the translated and abbreviated version of the FSA, additional research using divergent and convergent measures is suggested.

Study Conclusion

The current study provides an initial framework for future research on age bias and ageism. As a replication of the present study design might be difficult, future research must improve the design or employ different measures. Based on the large data set and variables collected, this study provides the opportunity for additional analyses with diverse variables in the future.

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Table 1

Demographic Information on Gender, Culture, and Language for all Participants

Participant	*N*	*%*
Gender		
Male	227	46.7
Female	247	50.8
Non-binary / third gender	7	1.4
Prefer not to say	5	1.0
Culture		
American	268	55.1
German	172	35.4
Other	32	6.6
Prefer not to say	14	2.9
Language		
English	275	56.6
German	211	43.4

Table 2

Demographic Information on Ethnicity for English- and German-Speaking Participants

Ethnicity	*N*	*%*
English-Speaking		
Caucasian	229	83.6
African-American	12	4.4
Hispanic	12	4.4
Multi-Ethnic	7	2.6
East-/Southeast-Asian American	5	1.8
South-Asian American	4	1.5
American Indian/Native American	2	0.7
Pacific-Islander American	1	0.4
Caribbean American	1	0.4
Other	1	0.5
German-Speaking		
EU-European	185	88.5
Non-EU-European	7	3.3
Multi-Ethnic	5	2.4
Asian	4	1.9
American	4	1.9
African	3	1.4
Other	1	0.5

Table 3

Categorization by Age and Culture Groups

Category	*N*	*%*
Age		
Young	152	34.5
Middle	149	39.9
Old	139	31.6
Culture		
American	270	61.4
German	170	38.6
Age by Culture		
American Young	83	18.7
American Middle	78	17.7
American Old	109	24.8
German Young	69	15.7
German Middle	71	16.1
German Old	30	6.8

Table 4

Change Scores in Age Estimations by Image Age and Image Culture in Raw Score Units

Image Age	*Mean*	*SD*	*Range*
American			
Young	1.15	3.39	-8.00 – 12.50
Middle	3.14	5.06	-11.00 – 17.50
Old	-5.40	4.87	-20.00 – 7.00
German			
Young	1.08	3.81	-8.50 – 13.00
Middle	-4.78	4.67	-20.50 – 12.50
Old	-13.06	5.50	-34.00 – 1.00

Table 5

Change Scores by Image Age and Image Culture in Absolute Values

Image Age	*Mean*	*SD*	*Range*
American			
Young	3.51	2.07	0.00 – 12.50
Middle	5.71	3.23	0.00 – 17.50
Old	6.47	3.79	0.00 – 20.00
German			
Young	4.09	2.38	0.00 – 13.00
Middle	6.02	3.46	0.50 – 20.50
Old	13.55	5.06	1.00 – 34.00

This table displays participants (N=440) mean difference scores, standard deviations, range of age estimations by image culture (American, German) and image age group (young, middle, old) in absolute values. For both image cultures, the ages of younger adults were estimated more accurately than the ages of middle-aged and older adults.

Table 6

*ANOVA Table Displaying Repeated Measures Effects of Image Age, Participant Age, and Image Age*Participant Age for American Images using Raw Change Scores*

Predictor	*SS*	*df*	*MS*	*F*	*p*	η^2p
Within-Subjects						
Image Age	15060.85	2	7530.42	488.27	< .001	.53
Image Age*Participant Age	154.07	4	38.52	2.50	.041	.01
Image Age*Participant Culture	27.95	2	13.97	.91	.404	.00
Image Age*Participant Age*Participant Culture	31.21	4	7.80	.51	.731	.00
Error	13356.17	866	15.42			
Between-Subjects						
Participant Age	43.21	2	21.60	.72	.49	.00
Participant Culture	.69	1	.69	.02	.879	.00
Participant Culture*Participant Age	10.42	2	5.21	.17	.840	.00
Error	12934.81	433	29.87			

Table 7

*ANOVA Table Displaying Repeated Measures Effects of Image Age, Participant Age, and Image Age*Participant Age for German Images using Raw Change Scores*

Predictor	*SS*	*df*	*MS*	*F*	*p*	η^2p
Within-Subjects						
Image Age	36692.01	1.90	19275.89	1148.92	< .001	.73
Image Age*Participant Age	253.44	3.81	66.57	3.97	.004	.02
Image Age*Participant Culture	71.75	1.90	37.69	2.25	.109	.01
Image Age*Participant Age*Participant Culture	43.06	3.81	11.31	.67	.603	.00
Error	13860.31	826.13	16.78			
Between-Subjects						
Participant Age	322.77	2	161.38	4.79	.009	.02
Participant Culture	16.84	1	16.84	.50	.480	.00
Participant Culture*Participant Age	1.10	2	.55	.02	.984	.00
Error	14636.03	434	33.72			

Table 8

*ANOVA Table Displaying Repeated Measures Effects of Image Age, Participant Age, and Image Age*Participant Age for American Images using Absolute Change Scores*

Predictor	*SS*	*df*	*MS*	*F*	*p*	$\eta^2 p$
Within-Subjects						
Image Age	1871.55	1.57	1194.55	89.92	< .001	.17
Image Age*Participant Age	10.19	3.13	3.25	.245	.873	.00
Image Age*Participant Culture	.58	1.57	.37	.03	.947	.00
Image Age*Participant Age*Participant Culture	43.19	3.13	13.78	1.04	.377	.00
Error	9033.54	679.97	13.29			
Between-Subjects						
Participant Age	1.91	2	.96	.11	.892	.00
Participant Culture	1.81	1	1.81	.22	.643	.00
Participant Culture*Participant Age	4.44	2	2.22	.26	.768	.00
Error	3646.72	434	8.40			

Table 9

*ANOVA Table Displaying Repeated Measures Effects of Image Age, Participant Age, and Image Age*Participant Age for German Images using Absolute Change Scores*

Predictor	*SS*	*df*	*MS*	*F*	*p*	$\eta^2 p$
Within-Subjects						
Image Age	18517.12	1.82	10175.94	747.92	< .001	.63
Image Age*Participant Age	429.88	3.64	118.12	8.68	< .001	.04
Image Age*Participant Culture	20.87	1.82	11.47	.84	.421	.00
Image Age*Participant Age*Participant Culture	7.51	3.64	2.06	.15	.953	.00
Error	10745.07	789.75	13.61			
Between-Subjects						
Participant Age	241.60	2	120.80	7.04	< .001	.03
Participant Culture	75.58	1	75.58	4.40	.036	.01
Participant Culture*Participant Age	50.54	2	25.27	1.47	.231	.007
Error	7450.15	434	17.17			

Table 10

Correlation Matrix of Marginal Mean Differences for Images of Old Adults with Measures of Experience and Interaction with Old Adults by Young Participants

Variable	*M*	*SD*	1	2	3	4
Age Estimations						
Old Americans	1.11	3.03	1			
Old Germans	-.82	4.02	.385**	1		
Experience	3.46	1.01	.038	.11*	1	
Interaction	3.48	.95	.03	.17**	.19**	1

Table 11

Regression Model for Mean Differences of Age Estimations for Images of Old Adults Predicted by Measures of Experience and Interaction with Old Adults by Young Participants

			95% CI			
Variable	Beta	*SE*	*LL*	*UL*	β	*p*
Old American Images						
Experience	.12	.42	-.72	.96	.03	.780
Interaction	-1.27	.45	-2.15	-.39	-.30	.005
Old German Images						
Experience	-1.21	.56	-2.32	-.09	-.23	.034
Interaction	-.05	.59	-1.23	1.12	-.01	.930

Table 12

Correlation Matrix of Ageism Measures with Participant Age and Culture

Variable	*M*	*SD*	1	2	3	4	5	6	7
FSA Discrimination	2.36	.25	1						
FSA Avoidance	2.27	.34	-.14**	1					
FSA Antilocution	2.11	.40	-.07	.57**	1				
Participant Age	42.83	15.32	.23**	-.32**	-.20**	1			
Participant Culture	--	--	.19**	-.18**	-.15**	.23**	1		
Experience (n = 152)	3.07	.97	.14	-.24**	-.18*	.06	-.79	1	
Interaction (n = 152)	3.03	.92	-.06	-.26**	-.19*	.11	-.02	.66**	1

Note. *Correlation is significant at the .01 level (two-tailed)

**Correlation is significant at the .05 level (two-tailed)

Interaction and Experience were measured on 5-point Likert scale ranging from low to high. Only young participants were included in the analysis for interaction and experience (n = 152).

Table 13

Regression Model for Differences in Ageism Subscales Predicted by Participant Age

			95% CI			
Variable	Beta	*SE*	*LL*	*UL*	β	*p*
Discrimination						
Participant Age	.004	.001	.002	.005	.23	<.001
Avoidance						
Participant Age	-.007	.001	-.009	-.005	-.32	<.001
Antilocution						
Participant Age	-.005	.001	-.008	-.003	-.20	<.001

Table 14

ANOVA Table Displaying Mean Differences in Ageism Subscales between American and German Participants

Predictor	*SS*	*df*	*MS*	*F*	*p*
FSA Discrimination					
Between	.93	1	.92	15.36	< .001
Within	26.16	483	.06		
Total	27.08	439			
FSA Avoidance					
Between	1.59	1	1.59	13.85	< .001
Within	50.39	438	.12		
Total	51.98	439			
FSA Antilocution					
Between	1.62	1	1.62	10.40	.001
Within	68.37	438	.16		
Total	69.99	439			

Table 15

ANOVA Table Displaying Mean Differences in Age Estimations between American and German Participants

Predictor	*SS*	*df*	*MS*	*F*	*p*	η^2p
Within-Subjects						
Image Age	25246.68	1.85	13675.29	1256.75	<.001	.74
Image Age*Participant Culture	13.17	1.85	7.13	.66	.51	.00
Error	8798.90	876	10.04			
Between-Subjects						
Participant Culture	3.35	1	3.35	.13	.719	.00
Error	11313.04	438	25.83			

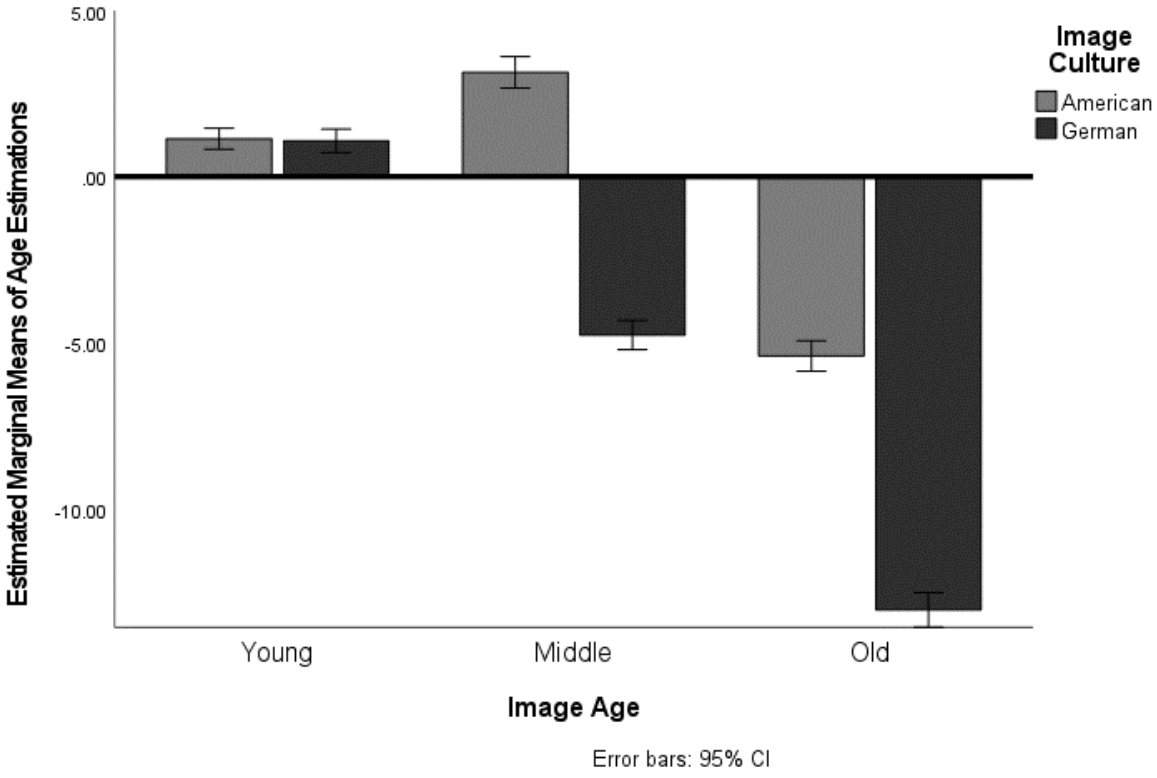
Table 16

ANOVA Table Displaying Mean Differences in Age Estimations between American and German Participants in Absolute Scores

Predictor	*SS*	*df*	*MS*	*F*	*p*	η^2p
Within-Subjects						
Image Age	8407.77	1.58	5325.90	572.733	<.001	
Image Age*Participant Culture	3.87	1.58	2.45	.26	.72	.57
Error	6429.88	691.43	9.3			.00
Between-Subjects						
Participant Culture	4.32	1	4.32	.56	.45	.00
Error	3359.15	438	7.67			

Figure 1

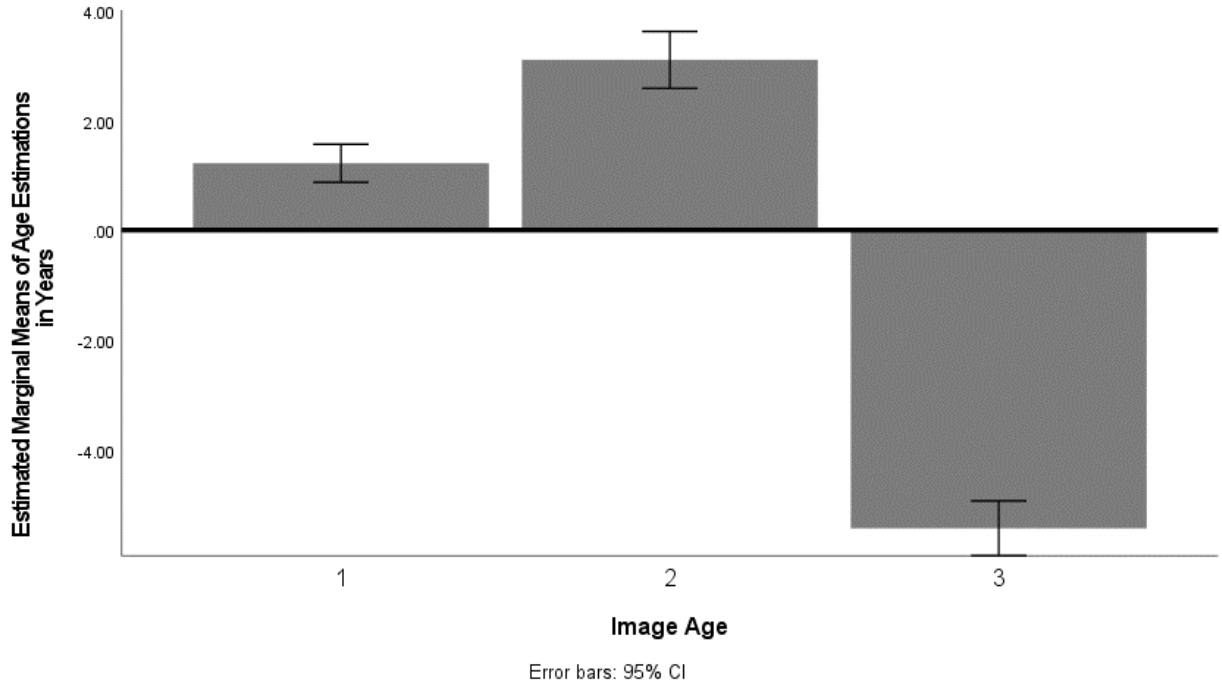
Marginal Mean Differences in Age Estimation for Image Age by Image Culture



Note: This figure displays the mean differences in age estimations for each image group (young, middle, old) separated by image culture (American, German). Mean differences were calculated by averaging difference scores for estimated age subtracted by actual age. Significant differences in age estimations for image cultures arose for age estimations of middle-aged and old adults.

Figure 2

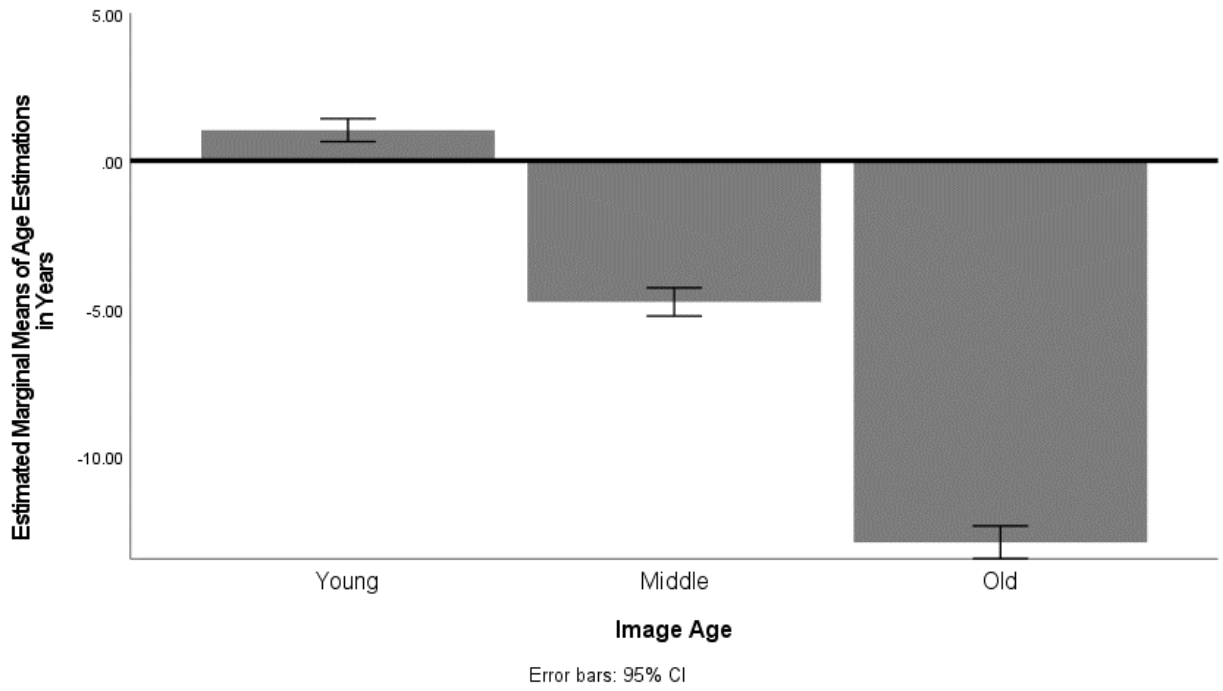
Estimated Marginal Means of Differences in Age Estimations for Image Age for American Images



Note: This figure displays the mean differences in age estimations for each image group (young, middle, old) for American images. Mean differences were calculated by averaging difference scores for estimated age subtracted by actual age. Significant differences in age estimations for image cultures arose for age estimations of middle-aged and old adults.

Figure 3

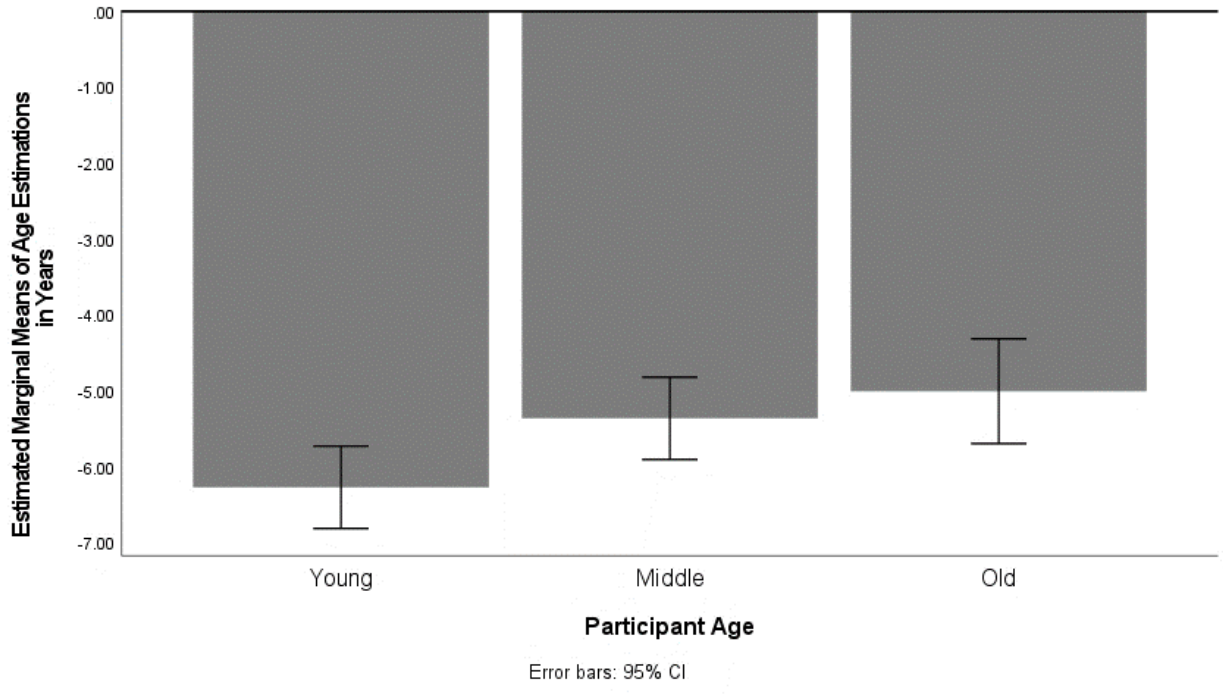
Estimated Marginal Means of Differences in Age Estimations for Image Age for German Images



Note: This figure displays the mean differences in age estimations for each image group (young, middle, old) for German images. Mean differences were calculated by averaging difference scores for estimated age subtracted by actual age. Significant differences in age estimations for image cultures arose for age estimations of middle-aged and old adults.

Figure 4

Estimated Marginal Means of Differences in Age Estimations by Participant Age for German Images



Note: This figure displays the mean differences in age estimations for each participant age group (young, middle, old) for German images. Mean differences were calculated by averaging difference scores for estimated age subtracted by actual age. Significant differences in age estimations for image cultures arose for age estimations of middle-aged and old adults.

Figure 5

*Estimated Marginal Means of Differences in Age Estimations by Image Age*Participant Age for American Images*

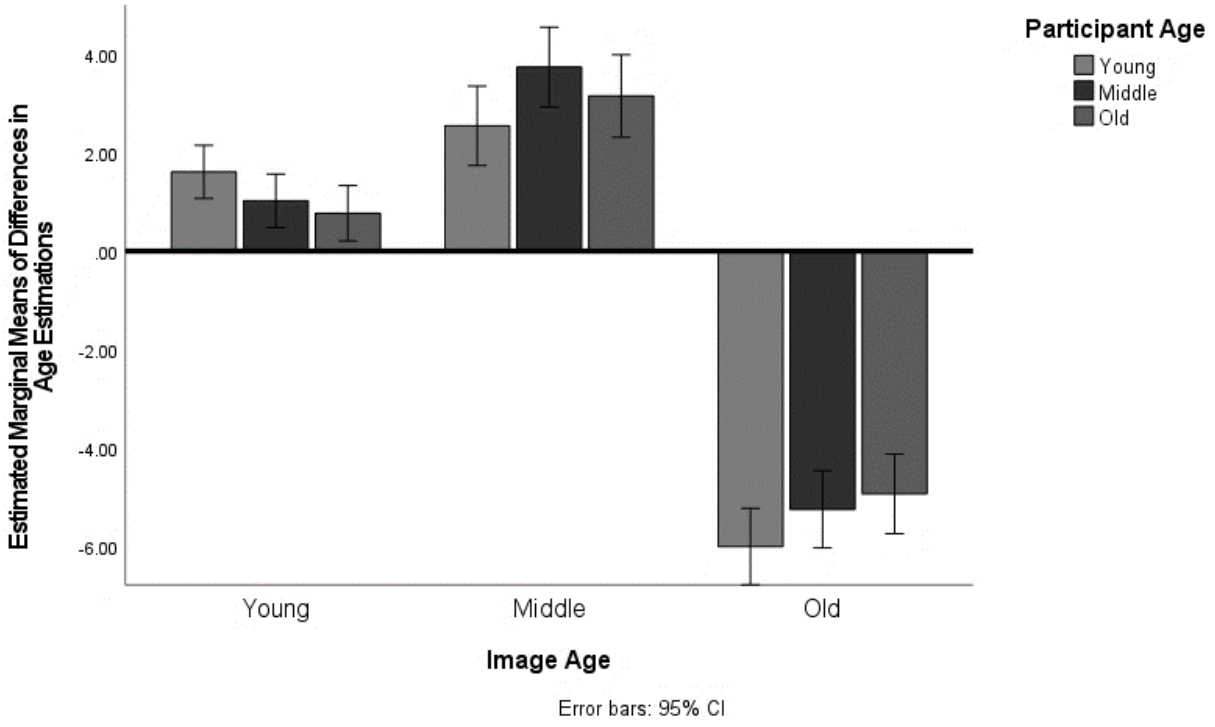


Figure 6

*Estimated Marginal Means of Differences in Age Estimations by Image Age*Participant Age for German Images*

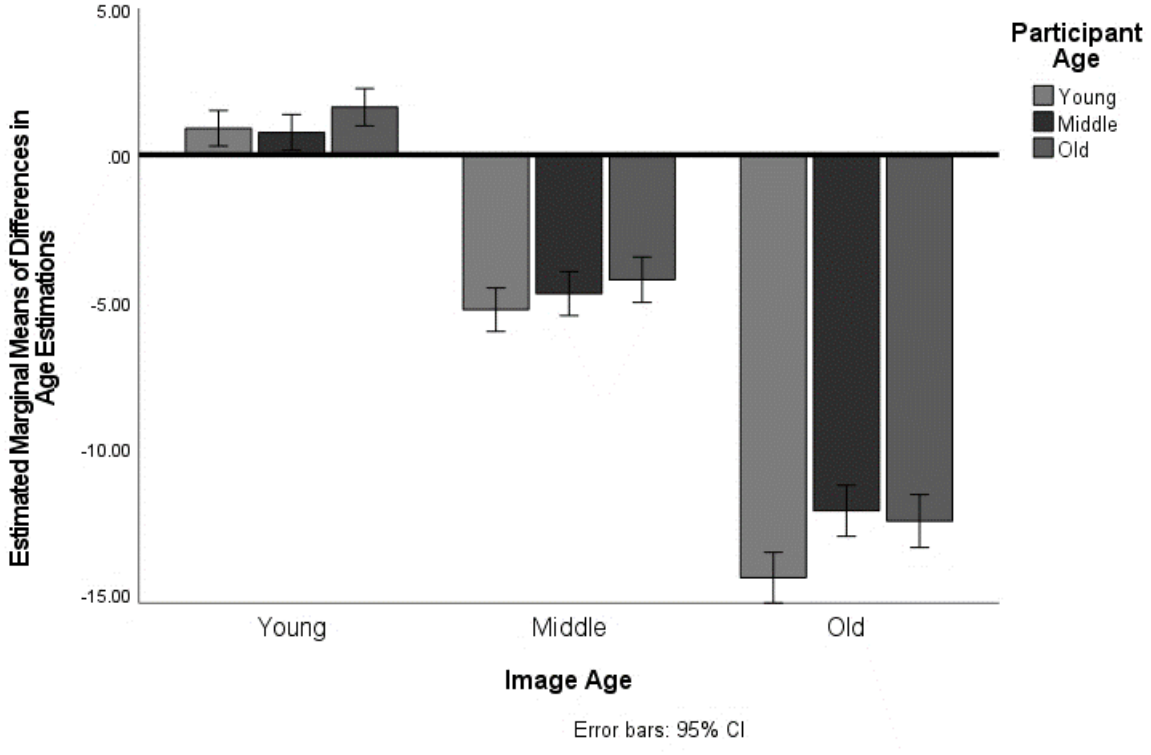


Figure 7

*Estimated Marginal Means of Differences in Ageism by FSA Subscale*Participant Culture*

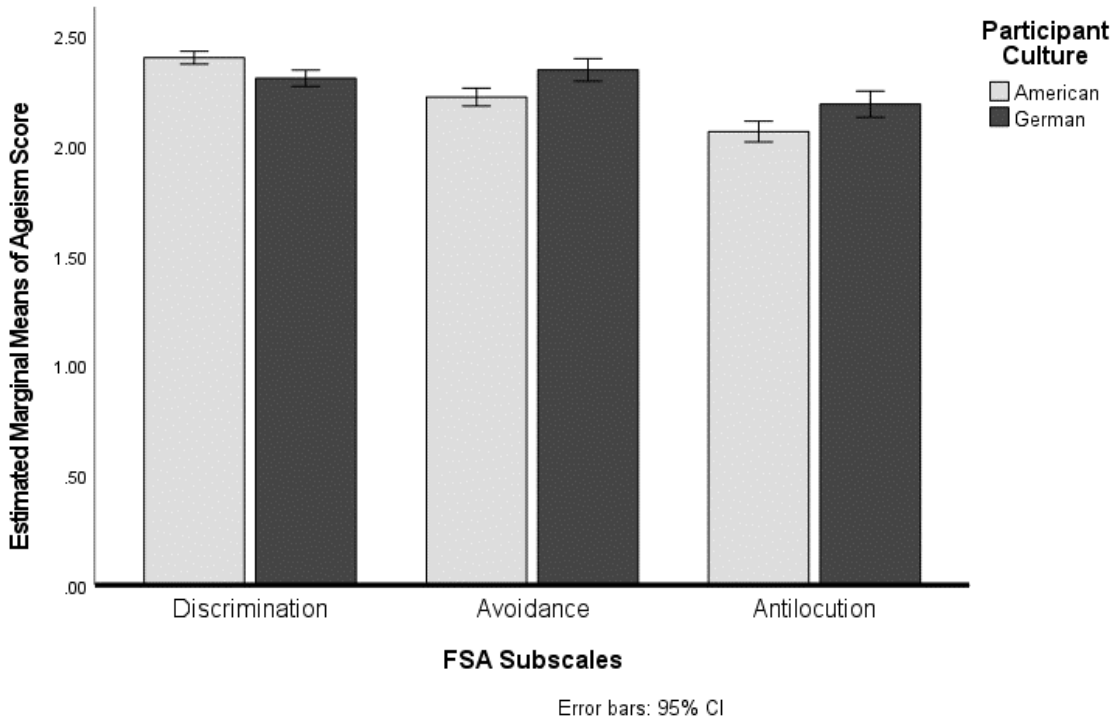


Figure 8

Estimated Marginal Means of Differences in Age Estimations for American and German Participants

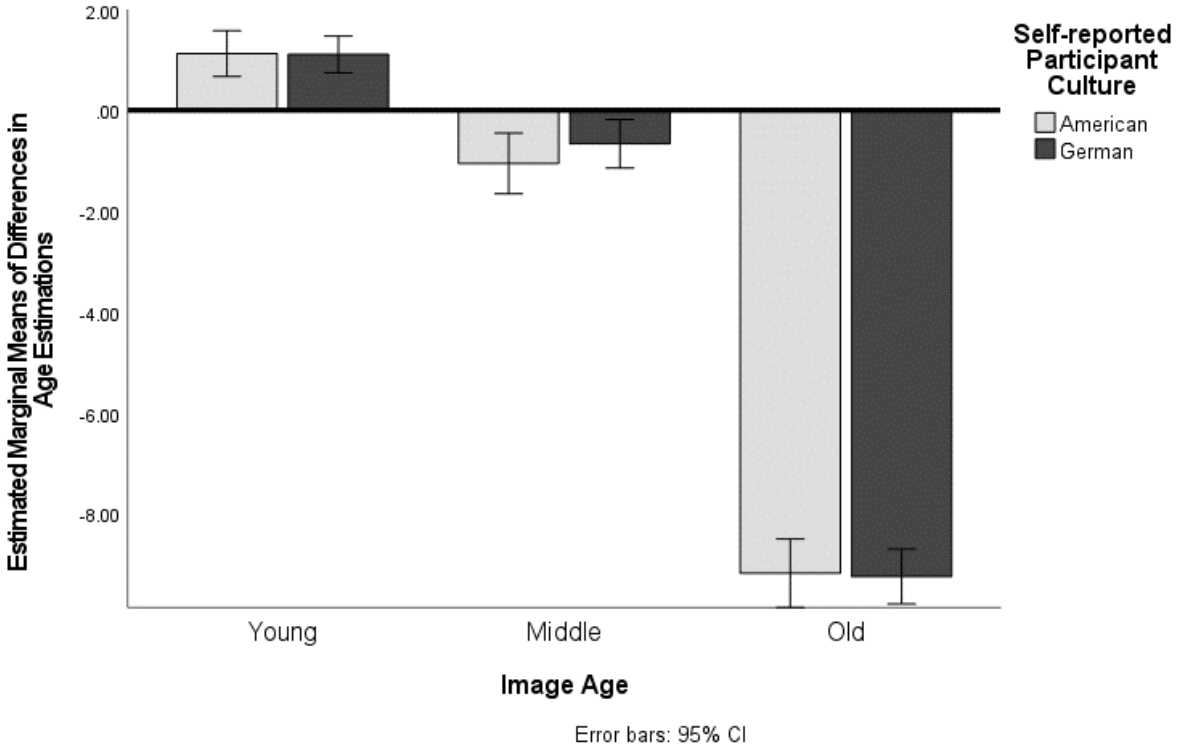


Figure 9

Estimated Marginal Means of Differences in Age Estimations for American and German Participants in Absolute Scores

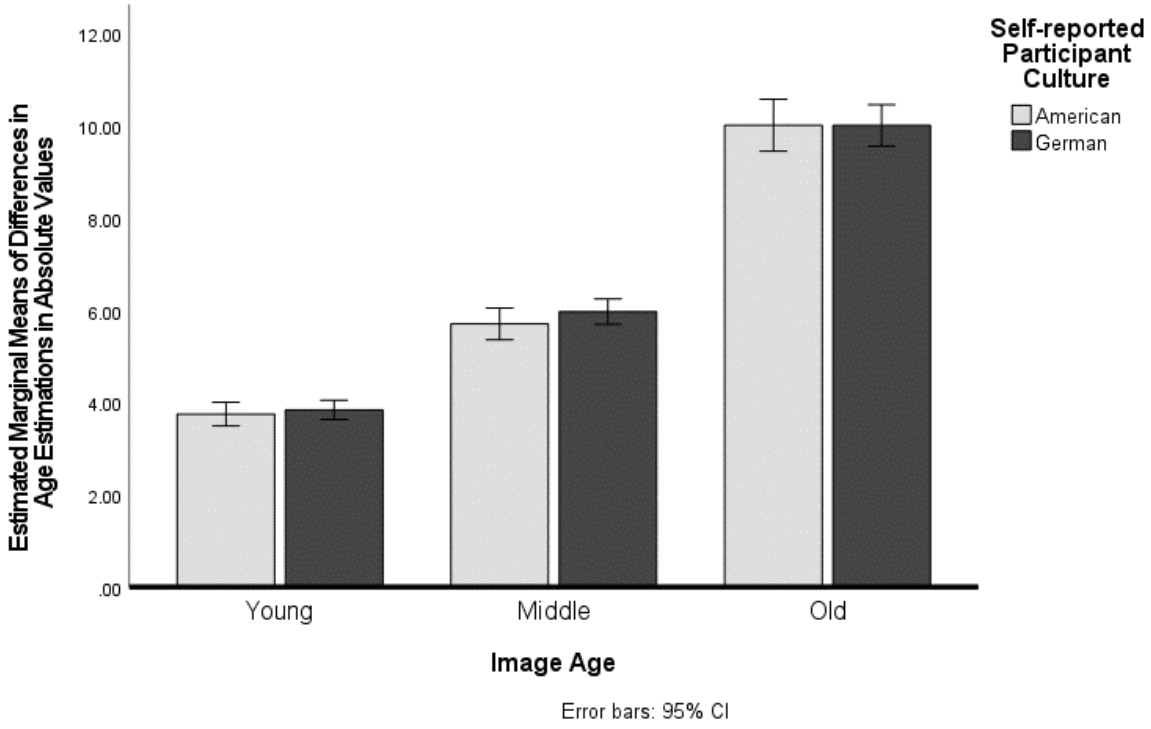


Figure 11

Scree Plot of the CFA for the Original FSA

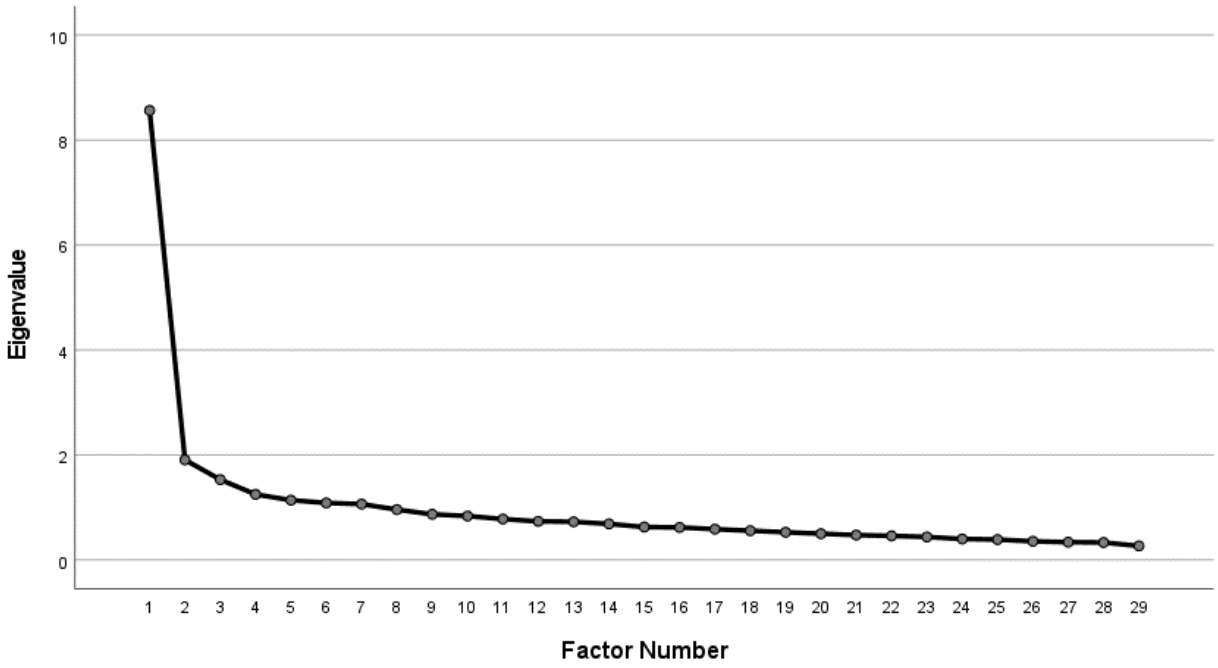


Figure 12

Scree Plot of the CFA for the German Translation of the FSA

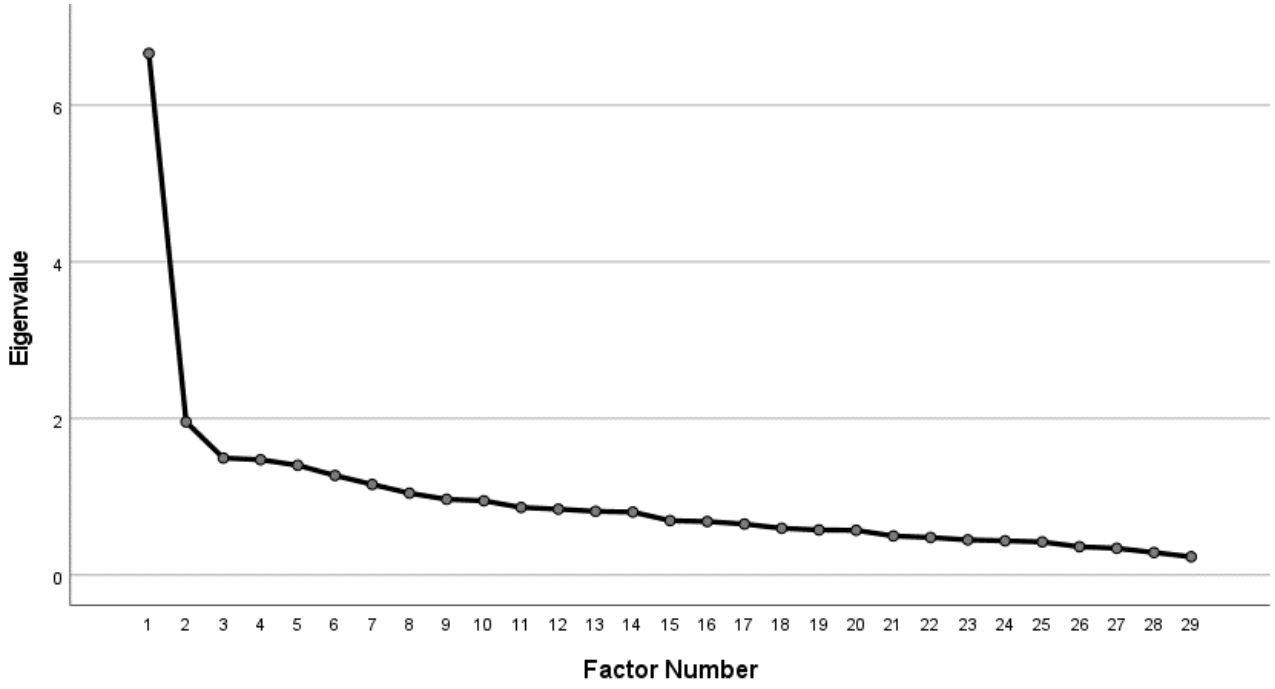


Figure 13

Scree Plot of the PCA for the Original FSA

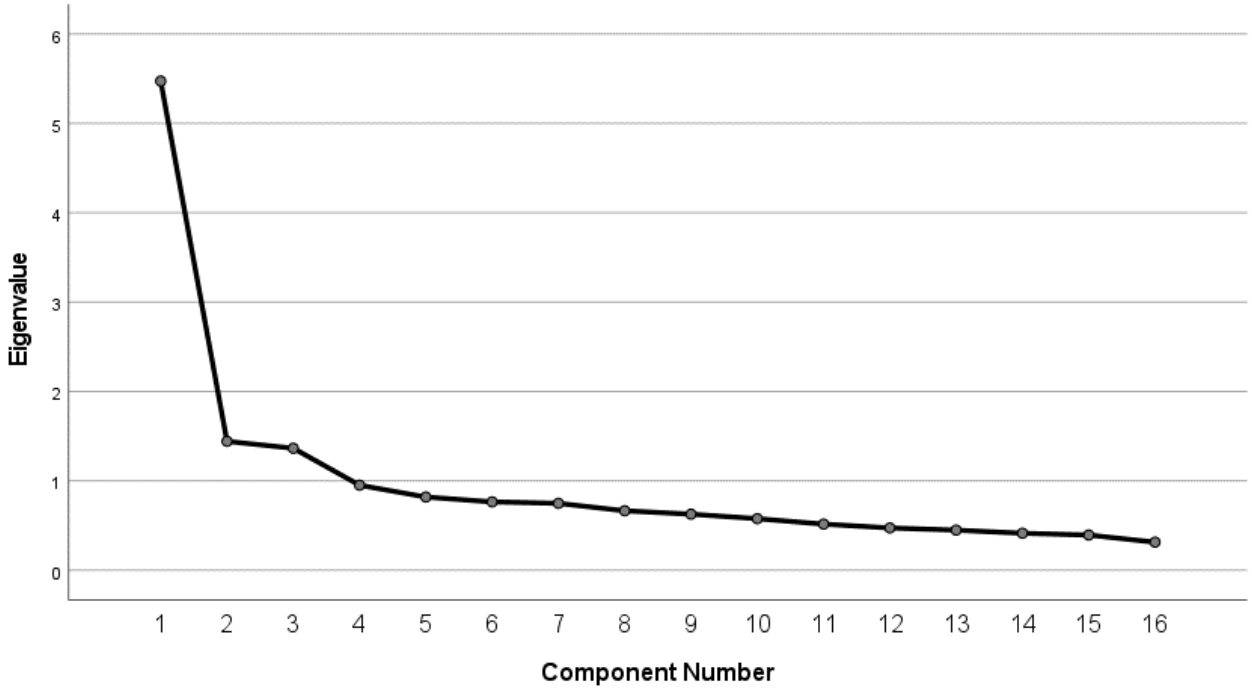


Figure 14

Factor Loadings and Subscale Correlations of the Original FSA

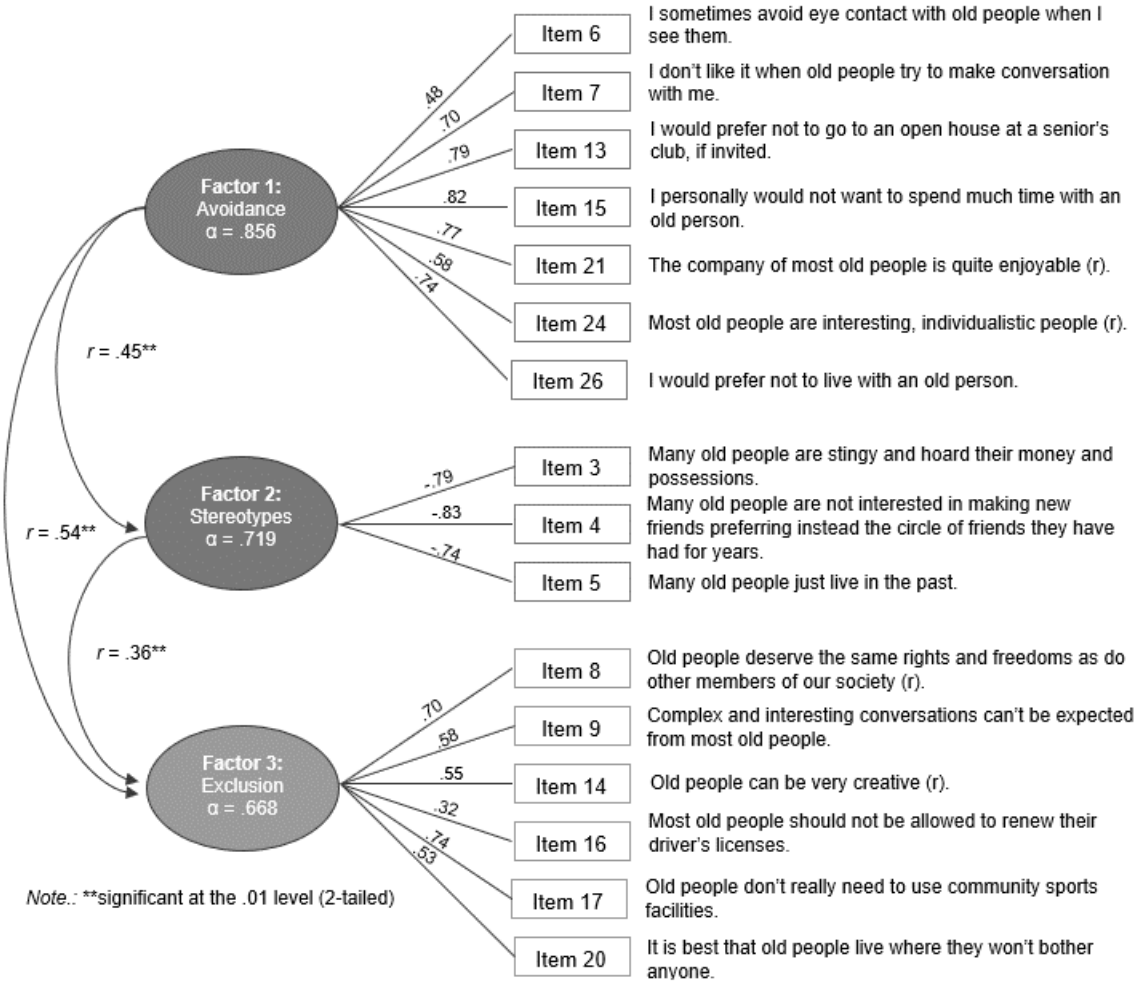


Figure 15

Scree Plot of the PCA for the German Translation of the FSA

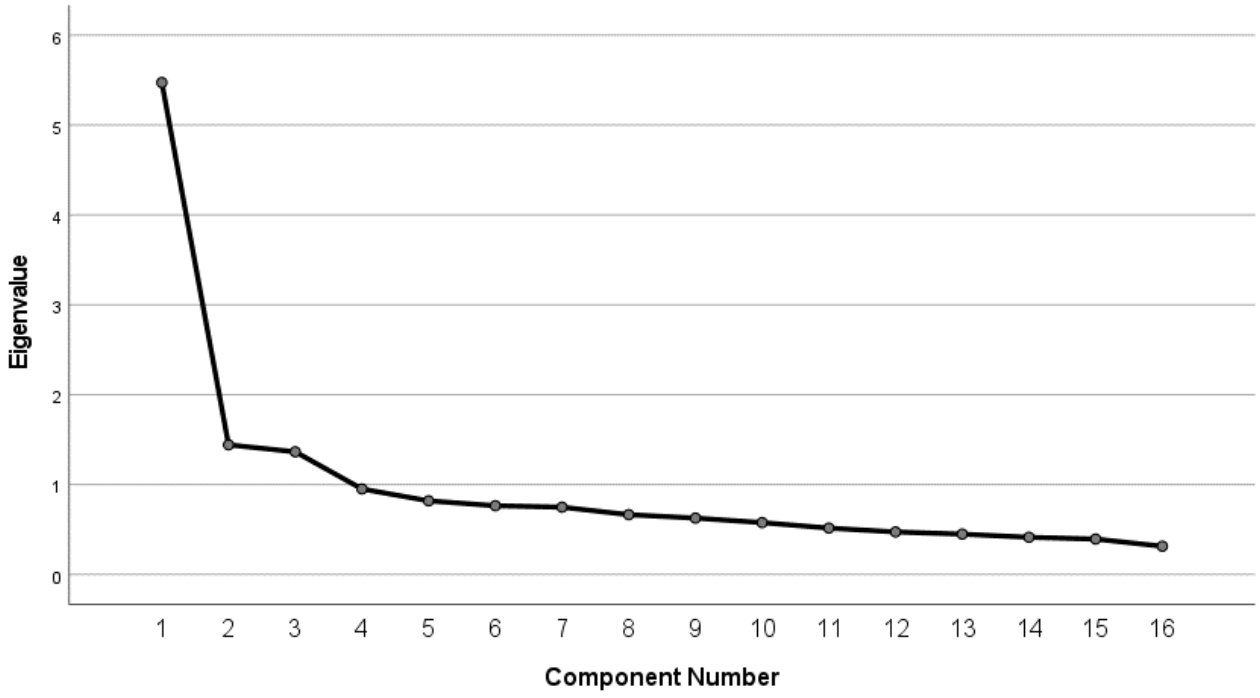
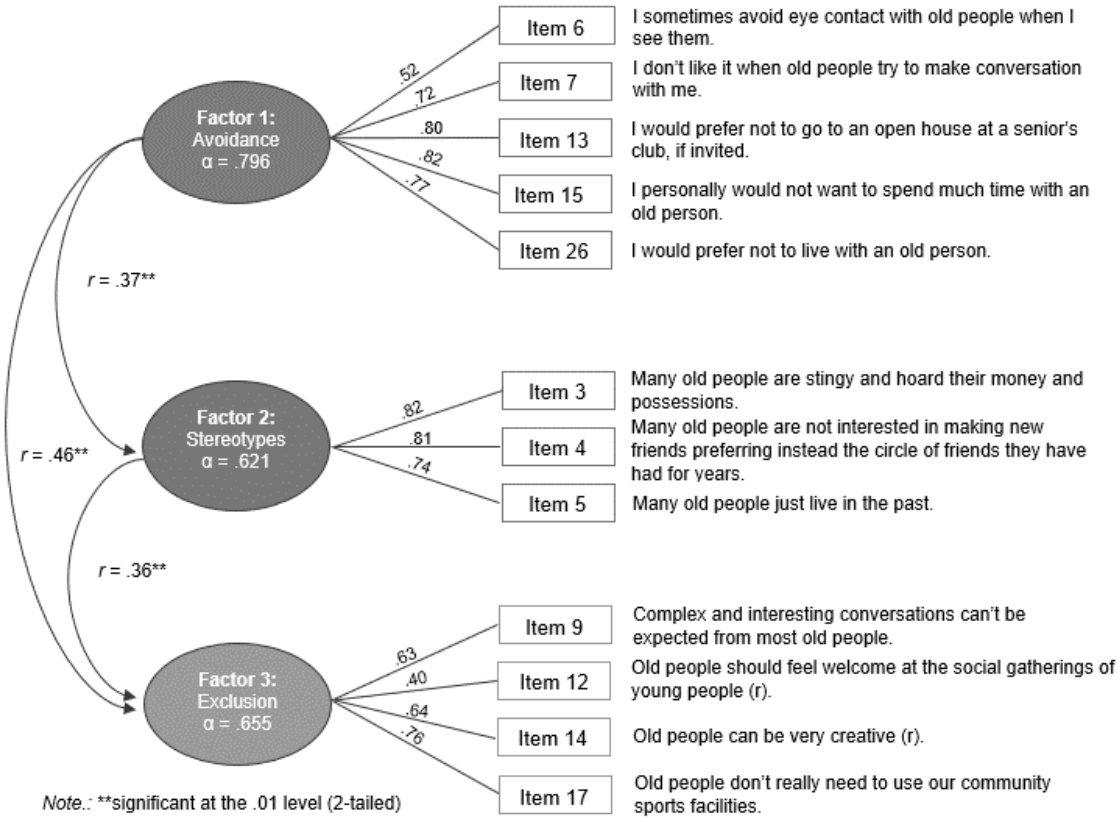


Figure 16

Factor Loadings and Subscale Correlations of the German Translation of the FSA



Appendices

Appendix A

Celebrity Names and Ages by Culture

American Actors:

1. Lucas Hedges, 25
2. Dave Franco, 36
3. Michael Shannon, 47
4. Michael Park, 53
5. Gregory Harrison, 71
6. Sam Elliot, 77

German Actors:

1. Jannik Schümann, 29
2. David Kross, 31
3. Florian David Fitz, 47
4. Wotan Wilke Möhring, 54
5. Hannes Hellmann, 67
6. Horst Janson, 86

Appendix B

The Fraboni Scale of Ageism (FSA, Fraboni et al., 1990)

Please address the following statements and state whether you agree or disagree with them.

1= strongly disagree

2= disagree

3= agree

4= strongly agree

*** Items are reverse-scored.**

1. Teenage suicide is more tragic than suicide among the old.
2. There should be special clubs set aside within sports facilities so that old people can compete at their own level.
3. Many old people are stingy and hoard their money and possessions.
4. Many old people are not interested in making new friends preferring instead the circle of friends they have had for years.
5. Many old people just live in the past.
6. I sometimes avoid eye contact with old people when I see them.
7. I don't like it when old people try to make conversation with me.
8. Old people deserve the same rights and freedoms as do other members of our society.*
9. Complex and interesting conversation cannot be expected from most old people.
10. Feeling depressed when around old people is probably a common feeling.
11. Old people should find friends their own age.
12. Old people should feel welcome at the social gatherings of young people.*
13. I would prefer not to go to an open house at a senior's club, if invited.
14. Old people can be very creative.*
15. I personally would not want to spend much time with an old person.
16. Most old people should not be allowed to renew their driver's licenses.
17. Old people don't really need to use our community sports facilities.
18. Most old people should not be trusted to take care of infants.

19. Many old people are happiest when they are with people their own age.
20. It is best that old people live where they won't bother anyone.
21. The company of most old people is quite enjoyable.*
22. It is sad to hear about the plight of the old in our society these days.*
23. Old people should be encouraged to speak out politically.*
24. Most old people are interesting, individualistic people.*
25. Most old people would be considered to have poor personal hygiene.
26. I would prefer not to live with an old person.
27. Most old people can be intimidating because they tell the same stories over and over
28. Old people complain more than other people do.
29. Old people do not need much money to meet their needs.

Appendix C

The German Translation of the Fraboni Scale of Ageism (Benz, 2023)

Bitte beurteilen sie die folgenden Aussagen und geben Sie an, ob Sie mit diesen zustimmen oder diese ablehnen.

1 = starke Ablehnung

2 = Ablehnung

3 = Zustimmung

4 = Starke Zustimmung

*** Aussagen sind invertiert**

1. Suizid im Teenageralter ist tragischer als Suizid in hohem Alter.
2. Es sollte spezielle Vereine für alte Menschen in Sportanlagen geben, so dass diese in ihrem angebrachten Niveau antreten können.
3. Viele alte Menschen sind geizig und horten ihr Geld, sowohl als auch ihren Besitz.
4. Im Alter verlieren viele Menschen das Interesse daran, neue Freundschaften zu knüpfen und bevorzugen lieber, in alten und jahrelangen Freundschaftskreisen zu verkehren.
5. Viele alte Menschen leben in der Vergangenheit.
6. Ich vermeide es manchmal, Augenkontakt mit älteren Menschen aufzunehmen, wenn ich diese sehe.
7. Ich mag es nicht, wenn ältere Menschen versuchen, mit mir ins Gespräch zu kommen.
8. Alte Menschen verdienen die gleichen Rechte und Freiheiten wie andere Mitglieder unserer Gesellschaft.*
9. Komplexe und interessante Konversationen können von den meisten alten Menschen nicht erwartet werden.
10. Es ist wahrscheinlich ein weit verbreitetes Gefühl, sich in der Nähe von alten Menschen deprimiert zu fühlen.
11. Alte Menschen sollten Freunde in ihrem Alter finden.
12. Alte Menschen sollten sich bei gesellschaftlichen Zusammenkünften junger Menschen willkommen fühlen.*
13. Ich würde es bevorzugen, nicht an einem Tag der offenen Tür in einem Seniorenclub teilzunehmen, wenn ich dazu eingeladen werde.

14. Alte Menschen können sehr kreativ sein.*
15. Ich persönlich würde nicht gerne viel Zeit mit einer alten Person verbringen wollen.
16. Den meisten alten Menschen sollte es nicht gestattet sein, ihren Führerschein zu erneuern.
17. Alte Menschen müssen unsere gemeinschaftlichen Sportanlagen nicht wirklich nutzen.
18. Den meisten alten Menschen sollte die Betreuung von Säuglingen nicht anvertraut werden.
19. Viele alte Menschen sind am glücklichsten, wenn sie mit Menschen in ihrem Alter zusammen sind.
20. Es ist am besten, wenn alte Menschen dort leben, wo sie niemanden stören.
21. Die Gesellschaft meister alter Leute ist sehr angenehm.*
22. Es ist traurig, heutzutage von der Notlage der Alten in unserer Gesellschaft zu hören.*
23. Alte Menschen sollten ermutigt werden, sich politisch zu äußern.*
24. Die meisten alten Menschen sind interessante, individualistische Menschen.*
25. Die persönliche Hygiene meister alter Menschen könnte als schlecht betrachtet werden.
26. Ich würde es vorziehen, nicht mit einer alten Person zu leben.
27. Die meisten alten Menschen können einschüchternd wirken, da sie immer wieder die gleichen Geschichten erzählen.
28. Alte Menschen beschweren sich mehr als andere.
29. Alte Menschen brauchen nicht viel Geld, um ihre Bedürfnisse zu befriedigen.

Appendix D

Interaction, Experience, and Demographic Information Items

Interaction and Experience:

1= Very rarely

2= Rarely

3= Sometimes

4= Often

5= Very often

1. Please indicate how experienced you are in interacting with older adults (65+ years of age)
2. Please indicate how often you interact with older adults (65+ years of age)

Demographic Information:

1. Please indicate your sex
3. Please indicate your age numerically
4. Please indicate which ethnicity you identify with
5. Please indicate which country you were born in
6. Please indicate which country you currently reside in
7. Please choose which culture you primarily identify with