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# Implicit Attitudes of Asian American Older Adults Toward Aging

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**Implicit Attitudes of Asian American Older Adults Toward Aging**

A Thesis Presented  
by

Anita L. Ho

Advisor: Dr. Lise Abrams  
Dr. Stacey Wood

To the Linguistics and Cognitive Science Department  
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The degree of Bachelor of Arts

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## Abstract

Greenwald, McGhee, and Schwartz (1998) developed the Implicit Association Test (IAT), a measure of mental associations between target pairs and positive or negative attributes. Highly associative categories yield faster responses than the reverse mental associations, which is thought to reflect implicit attitudes toward stereotypes. The present study investigated the effect of ethnic group on one's implicit attitudes toward aging and gender stereotypes by comparing two groups of older adults, Asian Americans and Caucasian Americans, that likely hold different culture values. Past qualitative studies have established the existence of mental health stigma in Asian American populations, including negative Asian American perceptions of aging, but have not yet established a quantitative measure of this phenomenon. The age-attitude and gender-science IATs were administered to 20 Asian American and 20 Caucasian American older adults in the Southern California region. The results from the age-attitude IAT found that Asian American older adults demonstrated higher implicit bias toward aging, evidenced by faster responses to the category pairings associating "old" + "bad" and "young" + "good". In contrast, performance on the gender-science IAT was similar for both groups, showing no strong bias toward gender stereotypes. Potential implications on the wellbeing of older adults, as stereotype threat and other forms of bias are already established harmful constructs in the population, are discussed.

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## Introduction

According to the United States Census, by the year 2030, all baby boomers will be older than age 65 and 1 in 5 U.S. residents will be of retirement age. By then, the population of individuals above 65 years old will outnumber those under 18 years old. These statistics have staggering implications on the state of healthcare in society, as the prevalent issue of ageism must be examined. Ageism is defined by the World Health Organization (WHO) as “the most socially ‘normalized’ of any prejudice” and stereotyping against people based on age and can lead to elderly individuals being excluded from jobs, social services, and communities. Ageism is also a cross-cultural issue in particular as the rate of international migration will overtake natural increases in population growth in the U.S. in 2030 as well, leading to a more racially and ethnically diverse U.S. population. Many of our stereotypes, like ageism, are left unspoken due to social conventions, but they can be measured by comparing the differences between explicit and implicit measures of those attitudes.

Explicit measures of attitude are those that exist consciously and are measured directly by asking people for their subjective ratings, such as level of warmth or coolness toward objects, or rating semantic differential items on a 7-point scale (Greenwald et al., 1998). The semantic differential rating scale measures connotations toward two concepts by asking participants to choose where their position lies on a scale between two polar opposites, such as “beautiful-ugly”, “good-bad”, “pleasant-unpleasant”, to elucidate the participant’s attitude toward the concepts. In contrast, implicit measures exist subconsciously and are not deliberately formed, but can be measured indirectly through tests like the IAT. On this test, attitudes are indicated through the latency of

categorization of relative associations between two concepts (Greenwald et al., 1998), a measure that cannot be influenced by outside factors the same way that explicit factors are. This has been observed in assessing socially sensitive attitudes, such as relationships between ethnic regard of in-group and out-group or racial evaluations. Effect sizes for explicit measures are smaller than implicit measures, indicating the former is more impacted by factors of self-presentation that are able to mask individuals' attitudes (Greenwald et al., 1998).

### **Implicit Association Test**

As noted above, the IAT is a measure of the strength of differential associations between two concepts through a 2-choice task and is ultimately capable of evaluating inherent stereotypes (Greenwald et al., 1998). Using response times to measure the association between two concepts is a well-established method in cognitive psychology. Priming is a technique in which being exposed to a particular stimulus influences one's response to a subsequent stimulus without conscious awareness. A specific type of priming is semantic priming, which is a phenomenon that occurs when hearing or reading a prime word in a lexical decision task facilitates the processing of a semantically related target word. A lexical-decision task involves verifying whether each target that appears is a real or in the language or not through a button press. As a result, the semantic priming effect shows that related words yield a faster response time than unrelated concepts. For example, the word "nurse" is recognized quicker after the participant is primed with the word "doctor" than if the participant was primed with the word "bread" since "nurse" and "doctor" are semantically related words (Meyer & Schvaneveldt, 1971). The IAT is a type of semantic priming between an attitude and a stereotype and measures the strength

of one's automatic association between the two based on speed of categorizing two target concepts with a stereotype attitude.

The IAT is a seven-part task that reveals underlying stereotypes through participants' speed of associations and directly indicates the relationships between attitudes and stereotype measures. One example of a stereotype assessed by the IAT is that of anti-Black discrimination in White subjects. Participants are first instructed to categorize word or image stimuli about a target concept into two categories, such as assigning first names as Black or African American or White or European American, "black" and "white" respectively, by pressing the associated key "E" and "I" keys. Next, they complete the same sorting procedure with attributes of valence as the two categories, such as "pleasant" or "unpleasant". Stimuli from the original study is shown in Table 1. The first two tasks are then combined, and one must sort stimuli into categories such as "black + pleasant" or "white + unpleasant", repeat the task, then repeat the task again after switching the positions (left or right) of the two target words to control for possible effects of key assignment. If associated categories have the same response key, one would have a faster response than if the two categories were less associated. Specifically, if one is faster at responding to associate "white + pleasant" and "black + unpleasant", one is thought to have a stronger association between White Americans and a pleasant meaning, indicating an implicit attitudinal preference for White over Black. The slower response to "black + pleasant" and "white + unpleasant" in turn represents increased effort, and therefore increased response time, to override one's mental associations.



Table 1  
*Race-attitude IAT blocks*

Sequence	1	2	3	4	5
Task description	Initial target-concept discrimination	Associated attribute discrimination	Initial combined task	Reversed target-concept discrimination	Reversed combined task
Task instructions	BLACK WHITE	pleasant unpleasant	BLACK pleasant WHITE unpleasant	BLACK WHITE	BLACK pleasant WHITE unpleasant
Sample stimuli	MEREDITH LATONYA SHAVONN HEATHER TASHIKA KATIE BETSY EBONY	lucky honor poison grief gift disaster happy hatred	JASMINE pleasure PEGGY evil COLLEEN miracle TEMEKA bomb	COURTNEY STEPHANIE SHEREEN SUE-ELLEN TIA SHARISE MEGAN NICHELLE	peace LATISHA fifth LAUREN rainbow SHANISE accident NANCY

*Note.* Description of the race-attitude IAT blocks, including five discrimination tasks. From “Measuring individual differences in implicit cognition: The implicit association test”, by Greenwald et al., 1998 *Journal of Personality and Social Psychology*, 74(6),

The IAT online experiment obtained data for nineteen months compiled from 600,000 tests to obtain a large-scale measure of people’s attitudes and stereotypes toward specific social groups, such as White vs. Black, young vs. old, and male vs. female tendencies to pursue careers in science and liberal arts, respectively (Nosek, Banaji & Greenwald, 2002). One of the IAT tests was administered to examine age biases and found that participants had faster automatic preferences for young over old. In the age-attitude IAT, participants classified names or faces representing young and old populations paired with words representing positive or negative valence. From multiple ageism-related IATs in adults’ associations of “old” + “negative” or “young” + “positive” categories were faster than if the reverse response keys were shared, indicating negative implicit attitudes present toward the elderly (Nosek et al., 2002). Congruent assignments like “young + positive” are those that are easier to associate, and therefore yielded faster

response time differences and reveal the IAT effect when compared to incongruent assignments, those that are more difficult to associate, like “old + positive” (Jenelec & Steffens, 2002). It was found that both elderly women and men were evaluated similarly, as elderly men and elderly women obtained similar ratings when automatic age bias for male and female targets were assessed separately (Jenelec & Steffens, 2002).

Furthermore, the negative implicit attitudes toward the old over young was seen in all ages in all racial and ethnic groups (Nosek et al., 2002).

While the effect is anticipated in adults due to results from the age-attitude IAT, Babcock, Malone-Beach, Hannighofer and Woodworth-Hou (2016) were curious if the effect would be replicated in elementary-school aged children. Indeed, they found that children at a young age also responded more rapidly in the Child-Age IAT, a child-friendly version of the Age-IAT, when positive categories were associated with young than when associated with old. In other words, children possessed stronger preferences for young over old than they reveal even at an early age, as shown through conflicting results of their implicit and explicit views. Isaacs and Bearison (1986) also found through social attitude scales and attitude-revealing behavioral measures that even preschool-aged children possessed negative stereotypes toward older adults. The tests assessed for factors such as proxemic distance, frequency of initiating eye contact, and number of words spoken toward aged and non-aged confederates (Isaacs & Bearison, 1986). Specifically, according to the social attitude scale (SASAP), children were significantly more prejudiced against elderly personalities (e.g., personality traits that would make one socially appealing or unappealing) than elderly abilities (e.g., traits related to effective functioning in society), indicating the extent children’s ageist prejudices were more

focused on the elderly having more negative personalities than the assumption that the elderly lack ability to function (Isaacs & Bearison, 1986). The fact that ageist effects increase as children grow older, demonstrates increasingly focused discrimination against elderly personalities which is a disturbing fact. Since aging stereotypes originate in early childhood, these stereotypes become further reinforced and internalized as aging self-stereotypes by the time one reaches old age (Levy, 2003).

Even as respondent age increased, implicit attitudes toward the elderly remained negative, bypassing any own-group preference (Nosek et al., 2002). The implications of these ageist stereotypes can be detrimental: even though both younger and older adults possess implicit negative stereotypes about older adults being dangerous drivers, for example, the impact on older adults' driving performance in real life is more likely to be observed due to the stereotype threat phenomenon (Lambert, Seegmiller, Stefanucci & Watson, 2013; Lambert et al., 2015). The stereotype threat becomes established "when a negative stereotype about a group that one is part of becomes personally relevant", and this influences the way one feels they are about to be judged, treated, or prone to live up to the stereotype they were just attributed to (Steele, Spencer & Aronson, 2002, p. 389).

### **Implicit Association Test Scoring**

The original IAT publication provided information regarding strengths of automatic associations in the form of response latencies and error rates (Greenwald et al., 1998). The IAT effect is the difference in mean latency between compatible and incompatible combinations, or differences between the critical blocks (e.g. "black + good" minus "black + bad) (Greenwald et al., 2003). The IAT effect was first indicated using Cohen's *d*, or effect size, with values of .2, .5, and .8 indicating small, medium, and

large effect size values, respectively. Key features of the original algorithm also included excluding responses with latencies over 1,800 ms or whose average response was over 1,500 ms, as well as data from participants who made errors in over 25% of trials in a single block. It also dropped the first two trials of test trial blocks and included error-trial latencies in the analyzed data (Greenwald et al., 1998). These procedures were justified as being the most likely to yield large statistical effect sizes.

Greenwald, Nosek, and Banaji (2003) later developed a new scoring algorithm based on data collected from the Yale IAT website experiment by Nosek et al. (2002), improving on features such as correlations with external self-report measures, resistance to artifact association with speed of reasoning, internal consistency, sensitivity to influences on response, and resistance to procedural influences. Table 2 summarizes the key modifications from the original IAT studies and reflects the current recommended *D*-score variant.

The new algorithm uses data from the original IAT's practice trials and calibrates it with the participants' variability and latency as well as penalty for errors. In this revised IAT, the data in the four combined blocks, Block 3 + Block 4 and Block 6 + Block 7, are used for analysis. The measure of IAT effect is the difference score, or *D*-score, which ranges from -2 to +2 with positive scores indicating faster speed of response in the compatible block (Target A + Positive; Target B + Negative) and negative scores indicating faster speed of response in the incompatible block (Target A + Negative; Target B + Positive). A *D*-score of 0 indicates no difference in speeds for compatible and incompatible trials. The new *D*-score differs from the Cohen's *d* measure, used in Greenwald et al. (1998), in that *D* divides the difference between test blocks by the

standard deviation of latencies in the two test blocks in order to account for variability of data the means are computed from. The denominator of  $D$  is calculated from a pooled standard deviation from both practice and critical blocks, while  $d$  only used a standard deviation of a within-person differences in latencies (Greenwald et al., 2003). In other words,  $D$  represents Cohen's  $d$  at a participant level. The new algorithm and  $D$ -score proved to be beneficial after being replicated on the election, gender-science, race, and age-attitude IATs on the following seven criteria: implicit-explicit correlation, correlation with average latency, internal consistency correlation, order effect correlation, correlation with IAT experience, IAT effect size, and implicit-explicit path in confirmatory factor analysis (Greenwald et al., 2003).

Table 2

*Summary of New IAT Scoring Procedures*

- 
1. Delete trials greater than 10,000 msec
  2. Delete subjects for whom more than 10% of trials have latency less than 300 msec
  3. Compute the "inclusive" standard deviation for all trials in Stages 3 and 6 and likewise for all trials in Stages 4 and 7
  4. Compute the mean latency for responses for each of Stages 3, 4, 6, and 7
  5. Compute the two mean differences ( $\text{Mean}_{\text{Stage 6}} - \text{Mean}_{\text{Stage 3}}$ ) and ( $\text{Mean}_{\text{Stage 7}} - \text{Mean}_{\text{Stage 4}}$ )
  6. Divide each difference score by its associated "inclusive" standard deviation
  7.  $D$  = the equal-weight average of the two resulting ratios
- 

*Note.* From "Harvesting implicit group attitudes and beliefs from a demonstration website", by Lane, Banaji, Nosek, and Greenwald, 2007, *Group Dynamics: Theory, Research, and Practice*, 6(1)

**Stereotype Threat and Older Adults**

Stereotype threat has also been shown to have an influence on the threatened group's behavior. Yueng and von Hippel (2008) found that if negative stereotypes regarding women being bad drivers were activated, female participants were two times more likely to hit jaywalking pedestrians in a driving simulator assessment. For elderly individuals, the knowledge that people in society, regardless of age, hold implicit

preferences associating negative word primes with old more than with young impacts the way they are treated and the way they carry out their own lives. Lambert et al. (2015) found slower brake response time as a function of working memory capacity for older adults exposed to the stereotype threat condition during a driving test experiment. The effects of stereotype threat were a distraction to older adults and as a result worsened driving performance and increased the risk of crashing by six times in those with the lowest working memory capacity scores (Lambert et al., 2015).

Furthermore, Levy (1996) found that subliminally activating positive stereotypes related to aging improved memory performance in older adults, while activating negative stereotypes produced undesirable views toward aging as well as worsened working memory performance and self-efficacy overall. Older adult participants who were exposed to negative age-stereotype conditions through priming intervention words and assessed immediately after priming perceived their own memory decline as inevitable through the computer priming task, thereby contributing to a self-fulfilling prophecy in which they also showed decline in four out of five memory tasks: immediate recall, delayed recall, photo recall, and photo recall prediction (Levy, 1996). Essentially, the saliency of the stereotypes activated contributed to faster identification of primes related to senility than wisdom.

However, there are some contexts in which negative stereotypes can help performance. For example, analysis of the motivational questionnaire administered prior to the driving simulation test indicated women who were exposed to the negative stereotype of women being bad drivers reported higher measures of motivation for performing well, despite worsened driving simulator results (Yueng & von Hippel, 2008).

Similarly, Levy (1996) found that subliminally activating positive stereotypes related to wisdom and aging improved memory performance in older adults in four out of five memory tasks (immediate, learned, delayed, and photo recall), since they shifted dominant negative self-stereotypes to positive self-stereotypes.

In the context of older adults being stereotyped as having poorer memory and slower response times, the stereotype threat becomes salient and influences their competency in performing associated tasks in both positive and negative ways, as older adults will conform to the self-relevant stereotype. According to Kray, Thompson, and Galinsky (2001), when people expect to perform poorly on a task, they will actually underperform compared to their potential as well as have beneficial or detrimental effects on performance. Even a subtle reminder that the upcoming task will be indicative of the individual's inherent ability and capacity to succeed can have the potential to increase or decrease expectations for one's performance. In particular, participating in a task related to a stereotype can cause people in the negatively stereotyped group in particular to believe the task to be representative of their inherent capabilities: this is a crucial implication for the stereotyping of other social groups. For example, one's ethnic group or ethnicities can cause variance between cultural values and barriers, and many explicit and implicit stereotypes people hold about themselves or each other create lasting impacts.

### **Aging Stereotypes Within Asian American Cultures**

Aging is a sensitive topic in Asian American households as demonstrated in several qualitative studies. In particular, Alzheimer's Disease and other related dementias are perceived as forms of mental illness with a great deal of shame attached for the

individual affected and his or her family. In a cross-cultural qualitative study of Chinese-American caregivers for dementia patients, a powerful social stigma toward mental illness was found (Guo, Levy, Hinton, Weitzman, & Levkoff, 2000). For example, there is a social pattern of the label awareness phenomenon, which is a pattern of avoiding using the dementia-label among the caregivers, as public knowledge of the condition would result in stigmatization toward both the individual with the disease as well as his or her family; as a result, Chinese-American families often normalize signs of dementia as part of the natural aging process and dismiss dementia-related symptoms displayed by their family members. Interestingly, even in those who were interviewed and who had a biomedical understanding of the disease this phenomenon was still observed (Guo et al., 2000). Specifically, Chinese-American doctors and nurses in this study possessed a sense of this aging stigma, and this limited their ability to use memory screenings and interview assessments of dementia on their patients (Guo et al., 2000). By attributing outside causes to mental illness, families are able to deflect social stigma they fear will be attributed to them.

Similarly, Liu, Tran, Hinton, and Barker (2008) also examined the relationship between stigma and dementia through qualitative interviews with middle-aged Chinese-American and Vietnamese-American caregivers and found further evidence of stigma toward chronic mental illness and stigma toward aging in 91% of the interviews. Researchers analyzed the wording caregivers used to describe their family member's illness and found that caregivers would label dementia symptoms in a way that would directly connect them with mental illness through illness labeling, etiological beliefs, and personal and social consequences, and experience of the illness. Furthermore, the stigma



encompassed negative connotations related to loss of status, moral failure, guilt and shame, discrimination due to dementia diagnosis. For example, one caregiver originally described her mother's dementia as a sign of "being crazy" until she worked in an elderly home and learned about the causes behind the abnormality. This was also shown through repeated labeling of older adults' cognitive decline as merely "confused". The caregivers distinguished those who had aged well and those who had aged less well, indicating the symptoms of dementia were less desirable through demeaning words like "childish", "confused", "foolish" or "difficult" (Liu et al., 2008).

Another phenomenon of distancing oneself from mental illness was indicated in a study by Nguyen and Seal (2014) that addressed specific issues Asian American older adults seek in terms of support services with the goal of raising awareness about the cultural heterogeneity of different Asian populations and subgroups, especially in regard to culturally-informed elder care. Researchers conducted semi-structured interviews Chinese and Hmong elderly individuals and compared definitions each group attributed with successful aging. They found that immigrant elders express values more aligned with maintaining physical and mental capacities for the purpose of maintaining independence and meaningful engagement than did elders who remained in their country of nativity. Furthermore, even though both groups believed chronic conditions like diabetes or hypertension to be natural parts of aging, neither group described mental wellness in terms of psychological disorders or illness.

### **Asian American Stereotypes Toward Mental Health**

Ethnic group can be a powerful determinant of one's beliefs and actions due to influences of cultural factors. When it comes to mental illness, Chinese immigrants in

particular believed mental illness to be a form of retribution against their own character or family legacy (Elliot, Di Minno, Lam & Tu, 1996). Similarly, Japanese Americans attributed their emotional and mental problems related to mental illness to karma influencing genetics (Shon & Ja, 1982). By internalizing these views and pathologizing symptoms related to mental deterioration, they attempt to provide distance between their families and the disease. Root (1985) found through qualitative interviews that Asian Americans believed the act of speaking with a mental health professional about psychological problems is an indication of disgrace and shame, leading to a tendency for Asian Americans to attempt to resolve their own problems through avoiding negative thoughts, exercising willpower, and avoiding disclosing information about their mental distress. In particular, the concept of “saving face” or “losing face” is a cultural consequence of Confucian and collectivist tradition that prioritizes preserving the public appearance of one’s family even if it means concealing one’s psychological state (Kim, Atkinson, & Umemoto, 2001). Despite there being a higher rate of Asian Americans diagnosed with psychosis and having increased stressors related to immigration, economic disadvantages, and racism, far fewer Asian Americans, specifically Chinese, Filipino and Japanese-Americans, utilize community mental health resources compared to other racial groups (Sue & McKinney, 1975). A very clear distinction seems to be drawn between physical health that is visible and mental health which Asian Americans believe is mainly all in one’s head. Data collected from seventeen community mental health facilities in Seattle indicated only 0.6% of clients seeking mental health services were Asian Americans despite the Asian Americans racial group accounting for 2.38% of

the population surrounding the facilities as a result of prioritizing cultural values like shame and preserving family name.

This tendency to avoid acknowledging one's mental health issues also begins at an early age. Kim and Omizo (2003) examined the relationship between Asian American college students' adherence to Asian cultural values, such as conformity to norms, family recognition through achievement and emotional self-control, and their attitudes toward seeking psychological help. The researchers found that Asian American students with higher adherence to Asian cultural values have more negative attitudes toward help-seeking (Kim & Omizo, 2003). Similar to the explanation provided by Sue and McKinney (1975), values like emotional self-control encourage Asian Americans to suppress uncomfortable feelings rather than express them, let alone access potentially helpful community resources. Furthermore, conformity to norms discourages individuals from deviating, or admitting to psychological problems, thereby negatively affecting family recognition through achievement and collectivism.

### **Implicit Measures Tests in Asian Americans**

In previous literature, the IAT has been conducted in Asian American populations to examine race stereotypes. Morin (2015) conducted a study through the Pew Research Center examining subconscious racial preferences in single race and multiracial adults, and East Asian Americans and biracial East Asian-white adults were evaluated. He found that Asian biracial adults were not more likely than single-race Asians to be race-neutral, meaning free of subconscious racial biases. On the other hand, it was found in a study focusing on understudied populations that minority children, including Asian Americans, develop implicit pro-White racial biases early on in their childhood when they are shown

images of both White and Black children (Steele, George, Williams, & Tay, 2018). Steele et al. (2018) administered Child IATs, a reduced length child-friendly version modeled after the original IAT, to South Asian, East Asian, and Southeast Asian children and found results that children ages 7 and 9 as well as adults were faster to associate positive valence pictures with White faces than Black as well as negative valence pictures with Black faces than White. Furthermore, the magnitude of the bias increased with age; however, the researchers suggested the greater bias was due to more opportunities to develop positive associations with White outgroup culture in the media and society.

A self-esteem study was also administered to Chinese, Chinese-American, and Euro-American populations to examine self-positivity and self-negativity perceptions (Boucher, Peng, Shi & Wang, 2009). Boucher et al. (2009) used an implicit association Go/No-Go Association Test (GNAT), a variation of the IAT, and an explicit Rosenberg Self Esteem Scale (RSES), ultimately concluding the Chinese-American group to be similar to the Chinese group in terms of lower indices of explicit self-esteem and similar to the Euro-American group in terms of higher indices of implicit self-esteem. This could be explained by the fact that individuals with constant exposure to multiple cultures possess multiple cultural frameworks that can be activated or suppressed based on context. Specifically, this biculturalism influences Chinese-Americans' views of self-esteem to explicitly evaluate themselves like Chinese and implicitly evaluate themselves like Euro-Americans.

### **The Current Study**

Having established the existence of both ageist stereotypes in the general population and as prevalence of increased stigma toward mental health and saving face in

Asian American populations, this study will combine the two trends to investigate views toward aging in Asian American older adults. In the experiment, we examine the response time between East Asian and Caucasian American older adults in the age-attitude IAT which ultimately reveals their implicit biases toward either young or old populations. The purpose of the current study is to examine the effects of Asian American values on ageism. This is important because patterns of ageism and cultural barriers impede healthcare treatment as well as deter populations from accessing sufficient support and understanding related to aging-related conditions. The way we perceive and care for the growing elderly population is related to how they attribute their declining cognitive processes, and if aging is believed to be a matter of personal responsibility rather than attributed to the natural aging process, we in turn reinforce our own negative self-stereotypes.

To my knowledge, no similar analyses of age stereotypes in Asian-American older adults using the IAT are available. The strength of the stigma against mental illness in certain cultural groups as well as the difficulty in admitting these biases leads to the importance of assessing these attitudes through implicit tests. Furthermore, to address the lack of implicit measures of the established Asian American stereotype toward neurodegenerative diseases like Alzheimer's or groups of symptoms like dementia, a measure of East Asian older adults' responses to the age-attitude IAT were taken with the goal of understanding the implicit attitudes underlying their views on aging. One would not be surprised to find significant effects across the elderly Asian American population, indicating the presence of stereotypes linking negative views of aging to one's own cultural biases. Based on previous literature, we hypothesize Asian American populations

to produce slower response times in the IAT compared to Caucasian Americans due to the inclination to associate shame and fears of losing face with mental illness, which includes dementia. Therefore, it is hypothesized that Asian American older adults will have lower *D*-scores on average in the age-attitude IAT, as they would find it more difficult to associate “old” + “good” and “young” + “bad”. Since Asian Americans might be slower completing the IAT overall due to the fact that it is not in their native language, their results on the age-attitude IAT will be compared to their results on the gender-science IAT, a test whose results are not affected by race. It is predicted that both groups of participants will show no group difference on the gender-science IAT.

## Methods

### Design

A mixed factorial design was used with the ethnic group (Caucasian American, Asian American) and IAT type (age-attitude, gender-science) as independent variables and the IAT *D*-score as the dependent variable. In the IAT *D*-score, negative values indicate preference for stereotypes, specifically “old + bad”, “young + good” in the age-attitude IAT and “female + liberal arts”, “male + science” in the gender-science IAT. In contrast, positive *D*-scores indicate preference for the reverse associations, which are not stereotypes. The seven blocks of the IAT were completed by participants in succession. The first block entailed 20 trials discriminating between targets (e.g. “old and young” face images or “male and female” terms) thereby assigning each category to a specific hand (“E” key for left hand and “I” key for right hand). The second block was 20 trials that incorporated attribute dimension also in the form of a two-category discrimination, between “good and bad” and “liberal arts and science”. The third block was a combined

incompatible block with both targets and categories using the initial left- and right-hand assignments in the previous blocks and contained 40 trials. Block 4 was the same as Block 3, also with 40 trials. Block 5 consisted of 40 trials of reversing categories and switching the associations between left- and right-hand keys from the earlier blocks. Blocks 6 and 7 were the same as blocks 3 and 4 but with the reversed left- and right-hand assignments. Data in Blocks 3 and 4 as well as Blocks 6 and 7 were used for analysis, whereas blocks 1, 2, and 5 were used for practice and not analyzed further.

### **Participants**

Forty individuals aged 60 years or older living in the Southern California region participated in the study (20 Caucasian American and 20 Asian American). Participants found out about the study through fliers and word-of-mouth. Study fliers described the study as one that was exploring aging effects. Criteria for inclusion also included identification as Asian American or Caucasian American, English proficiency as indicated through the Questionnaire (LEAP-Q) (Marian, Blumenfeld, & Kaushanskaya, 2007), as well as no cognitive impairment as indicated by results on the Mini Mental Status Exam (MMSE) prior to testing (Folstein, Folstein, & McHugh, 1975). Participants had to score at least a 23 out of 30 on the MMSE to participate in the study. Individuals from both groups performed similarly on the MMSE and all participants scored above 23. Individual participant limitations due to vision problems, such as nearsightedness, were addressed and resolved prior to administration of the IAT assessments by repositioning the placement of the computer screen and ensuring the participant had clear view of the stimuli. After completion of the study, all participants received \$10 in compensation as well as a debriefing. Demographics about both groups are shown in Table 3.

Table 3  
*Participant Data*

Characteristic	Asian American (n=20)	Caucasian American (n=20)
Gender		
Female	13 (65%)	15 (75%)
Male	7 (35%)	5 (25%)
Mean MMSE score out of 30 (s.d.)	28.05 (1.39)	28.45 (1.32)
Formal Education in U.S.		
Yes	16 (80%)	20 (100%)
No	4 (20%)	0
Immigration Status		
0-4 years	0	0
5-10 years	0	0
>11 years	10 (50%)	0
U.S.-born	10 (50%)	20 (100%)
Education (years)		
Less than high school (<12)	0	0
High school graduate (12)	1	0
Some college (13-15)	5	3
College or more (>16)	14	17

### **Apparatus and Materials**

Carpenter et al. (2018) established the validity of the *iatgen* tool, a survey-based IAT, across three empirical studies. The survey-based IAT was adapted from *iatgen*, a customizable IAT tool with all templates, examples, and editable code on the Open Science Framework (OSF) page for the project (Carpenter et al., 2018). *iatgen* provides the option to implement the original IAT procedure through a web application, Shiny, or downloadable R package. The *iatgen* web-based tool allows experimenters to upload customizable stimuli in the form of both words and images through Carpenter et al.'s (2018) user interface. The adaptation of the IAT to a survey format allows for more customizability, better data management, and decreased attrition rates in participants due



to its simple design. Specifically, researchers can modify features such as number of trials in each block, color of labels and stimuli, how errors are treated, duration between trials, duration of error messages, and display and reminders during the task. The HTML/JavaScript code was adapted and turned into a Qualtrics survey for assessment. Also included in the package is a data cleaning and scoring algorithm identical to that of Greenwald et al. (2003), which is incorporated into both Shiny and the R package. Data from Qualtrics was exported in CSV format and reuploaded to the iatgen web tool to be converted into individual *D*-scores for analysis.

Stimuli and labels for the age-attitude IAT are shown in Appendix A and were identical to the ones used in the original study (Greenwald et al., 1998). The stimuli in the gender-science IAT consisted of stimuli also based the original study and are listed in Appendix B (Greenwald et al., 1998). The gender-science IAT was administered to both groups of participants to compare performance on ageism words with another set stereotype words related to gender and career choices, a stereotype that was not expected to differ by ethnic group. A tendency to associate male terms with science and female terms with liberal arts terms was tested to measure whether there were any ethnic group differences in response times independent of age stereotypes, which could potentially occur if the Asian American participants had reduced language proficiency in English. A post-IAT questionnaire was also included to assess whether participants knew what they were being tested on as well as if that information affected the way they responded (Appendix C).

**Procedure**

All participants signed a consent form and completed the LEAP-Q and MMSE questionnaire prior to the experiment. The preliminary information included warnings cautioning participants about potential discomfort they may experience and described the limitations of the procedure itself. Participants were also reminded that they were under no obligation to complete the task once they have begun. Participants were individually tested in a quiet room in several different retirement communities. After being seated at a table with a computer whose display was confirmed to be visible, participants received all instructions from the computer screen and provided all of their responses via the “E” and “I” keys. They were to correctly categorize the words or images in the center of the screen into two categories on the upper left and right corners of the screen. Subjects were instructed to press the “E” key for targets that belonged in the left side category, and “I” for targets that belonged on the right. The instructions also encouraged participants to react to the target word or image as quickly and accurately as possible. If they categorized a target stimulus incorrectly, a red “X” would appear in the center of the screen and participants would have to hit the correct key before they could continue.

After each block, participants reviewed preliminary information and instructions about the next block and pressed the spacebar to continue when they were ready to proceed. Participants completed the gender-science IAT and age-attitude IAT (faces) consecutively, and the order of the two tests taken was counterbalanced between participants. After the implicit measure tests, participants completed a questionnaire that assessed whether participants knew they were being tested on stereotypes and whether that knowledge affected the way they responded. After participants completed both IATs

and the questionnaire, the experimenter debriefed them about the purpose of the study and answered any questions that arose. Each test, including consent, questionnaires, IAT tests, and debriefing, took about 30 minutes to complete.

### **Data Analysis**

The data were analyzed using SPSS for Mac version 22. A difference score, or *D*-score, was used to measure IAT effect, i.e., differences in average latency or response time between compatible and incompatible conditions. Data from the four combined blocks were used for analysis, and *D*-score calculations divide those differences between those blocks by the standard deviation of latencies in both practice and critical blocks to account for variability (Greenwald et al., 2003). Trials with errors were not eliminated from calculations, based on the *D*-score revision by Greenwald et al. (2003). The IAT's built-in error penalty forces participants to correct their answers, and the resultant latency reflects submission of the correct response. Trials with excessive time over 10,000 ms were to be excluded from calculations. Participants with response times that were too short would also be excluded: specifically, if over 10% of trials were faster than 300 ms. None of the participants in this study had response times in those ranges, so all participant data was included in analysis.

IAT *D*-scores were analyzed using a 2x2 (ethnic group x IAT test type) mixed ANOVA.

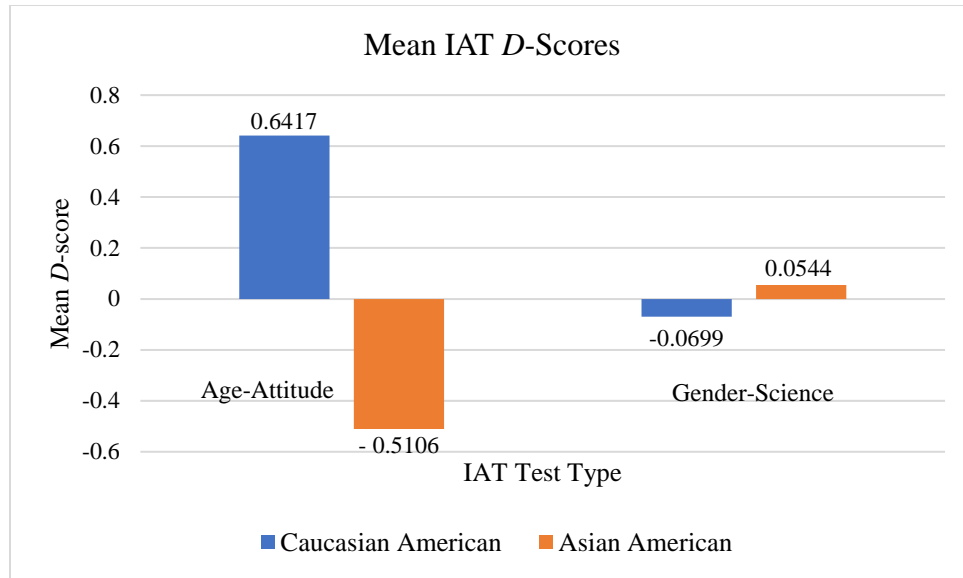
## **Results**

### **Implicit Attitudes Data**

The average *D*-scores of Asian American and Caucasian American older adults on both the age-attitude IAT and the gender-science IAT are shown in Figure 1. Based on

*D*-scores of the age-attitude IAT, Asian Americans showed moderate preference for “old + bad” and Caucasian Americans showed a moderate preference for “old + good”. Both groups showed little to no preference on the gender-science IAT. The 2-way (ethnic group and test type) ANOVA found a main effect of ethnic group [ $F(1,38) = 7.771$ ,  $MSe = .68$ ,  $p = .008$ ,  $\eta^2_p = .170$ ], where Asian Americans ( $M = -.5106$ ,  $SD = .8445$ ) had more negative average *D*-scores in the age-attitude IAT when compared to Caucasian Americans ( $M = .6417$ ,  $SD = .6773$ ). There was no main effect of test type [ $F(1,38) = .239$ ,  $MSe = .107$ ,  $p = .628$ ,  $\eta^2_p = .006$ ]. In addition, there was a significant ethnic group x test type interaction [ $F(1,38) = 18.133$ ,  $MSe = 8.149$ ,  $p < .008$ ,  $\eta^2_p = .323$ ]. Post-hoc pairwise comparisons were conducted to follow up this interaction within each level of test type. On the age-attitude IAT, Asian Americans had significantly lower *D*-scores than Caucasian Americans ( $p < .001$ ). However, on the gender-science IAT, the difference between ethnic groups was non-significant ( $p = .597$ ). Within each level of ethnic group, Asian American older adults had significantly higher *D*-scores for the gender-science IAT than the age-attitude IAT ( $p = .011$ ). Caucasian American older adults, on the other hand, had significantly higher *D*-scores for the age-attitude IAT than the gender-science IAT ( $p = .002$ ).

Pearson correlations between *D*-scores on the two types of IATs were then conducted within each ethnic group. The correlations were not significant, either for Asian Americans,  $r(38) = .274$ ,  $p = .243$  (see Figure 2), or for Caucasian Americans,  $r(38) = .087$ ,  $p = .716$  (see Figure 3), suggesting no linear relationship. However, Asian American older adults trended toward a higher degree of correlation between the *D*-scores of the two IATs.



*Figure 1.* IAT *D*-values for age-attitude IAT (left) and gender-science IAT (right) in Caucasian American and Asian American older adults. Negative *D*-scores are interpreted as association in the form of (Target A + Negative; Target B + Positive), whereas positive *D*-scores indicate the opposite bias in the form of (Target A + Positive; Target B + Negative). Specifically, negative *D*-scores on the age-attitude IAT reflect preference for the stereotype “old + bad”, “young + good”. Negative *D*-scores on the gender-science IAT reflect preference for the stereotype “female + liberal arts”, “male + science”. Positive *D*-scores indicate preference for the opposite associations, which are not stereotypes.

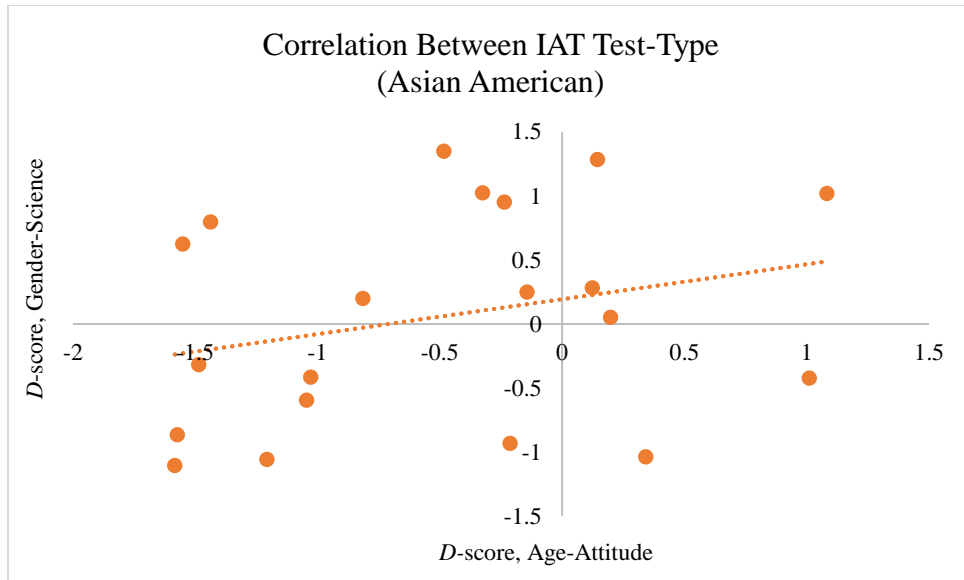


Figure 2. Correlation between IAT Test Types for Asian American older adults.

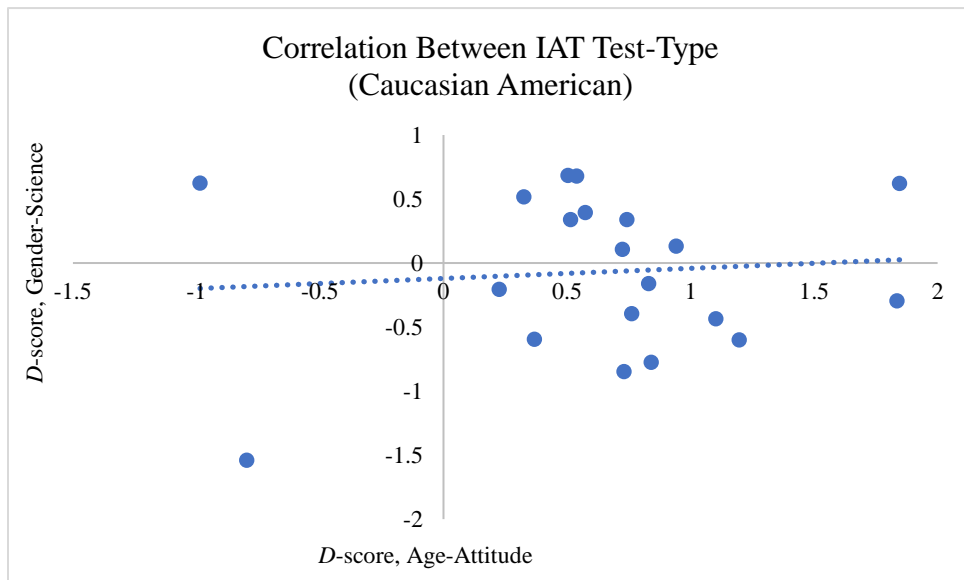


Figure 3. Correlation between IAT Test Types for Caucasian American older adults.

**Awareness of Stereotypes Being Measured**

The question "Did you know what the test was trying to assess? If you did know the purpose behind it, did that influence the way you took the test?" was asked in the follow-up questionnaire after both IATs were completed to see if participants were aware that stereotypes were being tested. 3 Caucasian American participants (15%) and 4 Asian

American participants (20%) correctly identified that the test involved stereotypes. Of those who identified stereotypes, only one participant in each ethnic group correctly guessed the study involved aging stereotypes specifically. However, no participants in either ethnic group reported being able to use that knowledge to influence their performance on the IAT tests.

### **Discussion**

The primary goal of the study was to assess if the stigma Asian Americans possess toward mental health in general as well as their established biases toward aging would be demonstrated quantitatively in an IAT. The age-attitude IAT reveals one's hidden biases toward ageism by measuring how quickly one associates positive and negative valanced words with the targets, faces of young adults and older adults. The results showed that Asian American older adults showed a preference for "old + bad" while Caucasian American older adults showed preference of "old + good" based on each group's *D*-scores, as predicted. In other words, Asian American older adults had more difficulty associating images of older adults with positive attributes and younger adults with negative attributes, supporting the idea that they have an implicit preference for the stereotype association compared with Caucasian American older adults. These results are in contrast to those of the gender-science IAT, which is designed to reveal biases by measuring how fast one associates words related with "male" and "female" with "science" and "liberal arts", respectively. In our experiment, there was no group difference, as both groups showed little to no preference for the association of "female + liberal arts" and "male + science".

Within ethnic groups, Asian American older adults had significantly higher *D*-scores for the gender-science IAT, indicating higher preference for “old + bad”, “young + good” and lower preference for “female + liberal arts”, “male + science”. On the other hand, Caucasian American older adults had significantly higher *D*-scores for the age-attitude IAT, indicating the opposite bias as Asian Americans. The lack of implicit bias Asian American participants had toward females pursuing science careers could be explained by the generally high participation of Asian Americans in STEM fields. Shen (2015) found a group of primarily East Asian young adult females were more likely to choose STEM careers over social science or humanities careers due to parental support and parental pressure, which they deemed parental influence theory, to pursue professional degrees in STEM with higher salaries. The Pearson correlations between *D*-scores of the two IAT types were not significant for either group, indicating that there is no linear relationship between the two IAT tests. However, there was a trend of Asian American participants having a slightly higher degree of correlation between the *D*-scores of both IATs.

The existence of deeply-rooted ageist beliefs from an early age can become engrained in one’s belief system and eventually condition one to implicitly hold onto these stereotypes into adulthood and older adulthood (Babcock et al., 2006; Isaacs & Bearison, 1986). Asian Americans are an ethnic group that have been known to possess stigmatized beliefs toward mental health including stereotypes toward aging-related disorders in particular. It is already well-established that Asian Americans, as early as college-age, experience a “double bind”, or culture-clash, that deters them from addressing mental health issues and accessing community resources (Lau et al., 2009).



Asian American caretakers are also seen to possess a sense of stigma when caring for their parents with dementia and other mental illnesses when they specifically avoid terms like “dementia” or “memory loss” to disassociate their family from the shame associated with mental illness (Liu et al., 2008). As a result, it is likely that mental health stigma of Asian American persists over time similarly to how ageist beliefs in the general population also persist over time.

The effect of these stereotypes could further compound the way Asian Americans perform on the age-attitude IAT, as seen in this study. According to Steele et al. (2002), the stereotype effect, or tendency to feel like one is conforming to stereotypes about one’s own social group, impacts one’s performance on tasks, such as in driving simulations (Lambert et al., 2013; Lambert et al., 2015). Asian American older adults, as a result, experience the stereotype effect in two dimensions as a result due to their age and ethnic group. Nosek et al. (2002) noted the lack of increase in implicit positive attitudes toward aging in older adult populations. One would expect that older adults would experience own-group preference while taking the age-attitude IAT, but this study showed that when Asian Americans categorize an individual as old, an assortment of negative constructs become increasingly accessible. The idea of own-group preference in Asian American older adults is further disconnected, as the mental health issues associated with aging reveal two unfavorable associations of their identity.

### **Limitations and Future Research**

This study did not have strict definitions of ethnic group and that could be an influential factor in the results, given that the term “Asian American” can encompass people of East Asian, South Asian, Southeast Asian, mixed race, Native Hawaiian or

Pacific Islander descent. In other words, the samples in this study may not be representative of all Asian American individuals in general because all the Asian American participants in this study were East Asian. It is possible the statistically significant implicit bias toward older adults in the age-attitude IAT was further compounded by only including one subgroup of Asian Americans. In particular, East Asian Americans have been found to be especially vulnerable to the stigma of chronic mental illness like dementia, while this finding has not been as well established in other Asian American populations (Guo et al., 2000; Liu et al., 2008). According to Kim et al. (2001), the concept of “saving face” reflects the views of East Asian Americans specifically, and this behavior is translated into the increased stigmatization of dementia in older adults. It would be interesting to investigate whether different cultural experiences and immigration narratives would cause results to vary, especially because they perceive mental health differently. For example, a study found that South Asian Americans differed significantly from East Asian Americans in how they perceived mental health services as related to dementia (Turner, Christie, & Haworth, 2005). Unlike East Asian Americans who are aware about their disorders but resistant to labeling, South Asians, according to this study, simply had poor knowledge about the progression of dementia but no cultural shame or stigma associated with diagnosis. The high rate of immigration as well as the increasing numbers of older adults in the population makes it important to prioritize cultural competency more than ever especially in screening and education of older adults from minority ethnic groups.

Because one’s ethnic group was hypothesized to play a role in one’s implicit biases, it was crucial to properly define which participants fit under which ethnic group.

In particular, half of the Asian American participants sampled were born in the United States and the other half all immigrated over a few decades ago. In general, the impact of immigration and acculturation needs to be further investigated within immigrant groups, as one's degree of acculturation plays a factor in determining one's beliefs and values. One might have expected the Asian Americans who were born in the U.S. to share similar values with the Caucasian American group due to increased exposure to Western values. However, despite those predicted similarities it is still interesting that such a significant difference in preference for negative age stereotypes was found between the two ethnic groups. Because Asian Americans are known to possess stigmatized views toward mental health and associated help-seeking, psychiatric evaluations and treatments should be tailored to be more culturally appropriate and relevant. Researchers and clinicians should be trained to work with ethnic minority groups in order to provide the most effective outreach services, as one's culturally-linked values impact one's physical and mental wellbeing.

### **Mental Health in Asian American Older Adults**

This study's findings regarding the ability of ethnic-group to impact one's biases raises red flags regarding the pervasiveness of ageism and stigmatization, particularly in Asian American older adults. The influence stigma has on older adults' decisions regarding medical care and can be better understood through qualitative interviews. However, implicit attitudes are not often revealed clearly, and this study sought to show this effect through a quantitative measure like response time. Lack of acknowledgement of mental health results in increased suffering, minimization, and decreased help-seeking, which all have harmful long-term effects. Raising awareness about Asian Americans'

deeply rooted shame could benefit Asian American families with older adults who are affected by dementia and create a more multifaceted healthcare.

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(Appendices follow)



**APPENDIX A**  
Labels and Stimuli for Age-Attitude IAT

Labels:

Joy, Love, Peace, Wonderful, Pleasure, Friend, Laughter, Happy  
Agony, Terrible, Horrible, Nasty, Evil, War, Awful, Failure

Stimuli:



**APPENDIX B**  
Labels and Stimuli for Gender-Science IAT

Labels:

Astronomy, Math, Chemistry, Physics, Biology, Geology, Engineering

History, Arts, Humanities, English, Philosophy, Music, Literature

Stimuli:

Mother, Wife, Aunt, Woman, Girl, Female, Grandma, Daughter

Man, Son, Father, Boy, Uncle, Grandpa, Husband, Male

**APPENDIX C**  
Post-IAT Questionnaire

- Describe your experience completing the computer task.
- Did you know what the test was trying to assess? If you did know the purpose behind it, did that influence the way you took the test?
- How long have you lived in the United States?
- Did you attend school in the United States?
- What was your occupation (in home country and U.S.)?
- What percentage of the time do you use English now? (e.g. 50% of the time)