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# THE MODERATING ROLE OF AGE-GROUP IDENTIFICATION AND PERCEIVED THREAT ON STEREOTYPE THREAT AMONG OLDER ADULTS*

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**ABSTRACT**

Although research has shown that older adults are negatively affected by aging stereotypes, relatively few studies have attempted to identify those older adults who may be especially susceptible to these effects. The current research takes steps toward identifying older adults most susceptible to the effects of stereotype threat and investigates the consequence of stereotype threat on the well-being of older adults. Older adults were tested on their recall of a prose passage under normal or stereotype threatening conditions. Memory decrements for those in the threat condition were moderated by perceived stereotype threat such that greater decrements were seen for those who reported greater perceived threat. A similar pattern was observed for negative emotion, such that those in the threat condition who reported higher perceptions of threat experienced a greater decrease in positive emotions. Age group identification also proved to be an important factor, with the strongly identified performing worse than the weakly identified. As well, high age-group identification buffered some of the negative affective consequences associated with stereotype threat, which is consistent with some models of coping with stigma.

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Referred to by some as the "last bastion of bigotry", ageism is thought to represent the most socially condoned and institutionalized form of prejudice in the world today (Nelson, 2002). One consequence of prejudice and stereotyping of older adults is the experience of stereotype threat, a mechanism by which concerns about fulfilling a negative stereotype interfere with performance and, therefore, lead to stereotype fulfillment (Steele & Aronson, 1995). Dangerously, stereotype threat works cyclically to both create and maintain stereotyped beliefs. For older adults, the stereotype threat associated with negative memory-related stereotypes can lead to vast decrements in memory performance (Chasteen, Bhattacharyya, Horhota, Tam, & Hasher, 2005; Hess, Auman, Colcombe, & Rahhal, 2003). Although research has shown that older adults are often negatively affected by aging stereotypes, and stereotype threat specifically (Chasteen et al., 2005; Hertzog & Hultsch, 2000; Hess et al., 2003), only a few studies to date have identified older adults who may be especially susceptible to these effects (Levy, 2008; O'Brien & Hummert, 2006). One goal of the current research project is to add to this literature by examining potential moderators of the stereotype threat effect among older adults. Identifying those older adults most susceptible to stereotype threat is the first step toward creating targeted interventions to reduce the impact of stereotype threat on the growing older adult population.

Most research on the effects of age stereotypes and stereotype threat on older adults has focussed on consequences for cognitive or behavioral performance. For example, studies have shown that simple exposure to negative aging stereotypes led to decreases in walking speed (Hausdorff, Levy, & Wei, 1999), a shaky, sloppy handwriting style (Levy, 2000), as well as reduced memory performance (Levy, 1996). As for stereotype threat effects, older adults exposed to stereotype threat performed worse on a recall task than both younger adults and older adults not exposed to threat (Hess et al., 2003). In addition, perceptions of stereotype threat have been shown to be powerful predictors of memory performance, with older adults reporting greater feelings of threat and showing worsened memory performance compared with young adults (Chasteen et al., 2005).

As of yet, however, only a few researchers have looked beyond performance effects to examine the consequences of age-based stereotyping on the emotional health and well-being of older adults. Another goal of the current research project, then, was to address the paucity of research on the interaction between age-related stereotyping and well-being by specifically examining the effect of stereotype threat on the emotions of older individuals. Indeed, holding negative age self-stereotypes leads to decreased positive affect and a reduced will to live (Levy, 2003), so it can be hypothesized that being the target of negative age stereotyping will also have deleterious effects on older adults' emotional well-being.

Research on age stereotyping is distinct from research on gender and racial stereotypes in a number of ways. One of these is the relatively normative and institutionalized existence of negative views of aging and of the older adult community as a whole (for reviews see Pasupathi & Lockenhoff, 2002; Wilkinson

& Ferraro, 2002). Ageism is culturally embedded in our language, humor, music, art, literature, television, and advertising (Cohen & Kruschwitz, 1990; Covey, 1988; Palmore, 1971; Robinson & Skill, 1995; Ryan, Hamilton, & Kwong See, 1994; Smith, 1979). Because of the common and pervasive negative view of aging and older adults in our society, age stereotypes may be activated through seemingly innocuous cues and behaviors (for example, having to write down your age on an intake form at the doctor's office). In order to examine this idea more fully, a third goal of our research project was to use a "real-life" manipulation to induce stereotype threat and, further, to investigate the consequences of stereotype threat on an everyday memory task that mimics what older adults must do in their daily lives. This type of threat manipulation is distinct from previous manipulations of stereotype threat with older adults which involve procedures and tests that are relatively overt (for example, having older adults read a news article about age-related decline in memory). Instead, we were interested in examining the effects of more subtle situational cues (for example, completing tasks in the presence of younger adults), that older adults encounter repeatedly in their daily lives.

## THE CURRENT RESEARCH

The goals of the current research project are threefold:

1. to identify those older adults who are most susceptible to stereotype threat;
2. to examine the emotional consequences of experiencing stereotype threat; and
3. to test the effects of real-life stereotype threat on everyday memory performance.

To achieve these goals, we had older adult participants complete a test of everyday memory performance (memory for a prose passage) either in a stereotype threat condition or in a no-threat condition. As a real-life manipulation of stereotype threat, participants in the stereotype threat condition completed the memory task with a young confederate in the room. Those in the no-threat condition completed the memory task along with another older adult. In addition, the test materials in the stereotype threat condition were quite formal, resembling what older adults might encounter at a doctor's office or when renewing a driver's license, while the test materials in the no-threat condition were quite informal and suggestive of a casual environment. Dependent variables of interest included free, cued, and recognition-based recall of the prose passage, as well as measures of specific positive and negative emotions taken both before and after the stereotype threat manipulation.

We tested a number of potential moderators of the stereotype threat effect: age-group identification, and state (situational) and trait (dispositional) perceived stereotype threat. Our first potential moderator, age-group identification,

refers to the extent to which individuals identify with their age group (Garstka, Branscombe, & Hummert, 1997). Group identification has been shown to moderate racial and gender stereotype threat effects (e.g., Mendoza-Denton, Downey, Purdie, Davis, & Pietrzak, 2002; Nosek, Banaji, & Greenwald, 2002; Pronin, Steele, & Ross, 2004; Schmader, 2002) as well as age stereotype threat effects among late middle-aged adults (O'Brien & Hummert, 2006). For example, women who are more highly identified with their gender group are more affected by negative stereotypes about women and math ability (Schmader, 2002). Following from this, women are actually able to buffer the effects of stereotype threat in the domain of math achievement by disavowing feminine characteristics, thereby reducing their identification with their gender group (Pronin et al., 2004). However, research on the rejection-identification model (Branscombe, Schmitt, & Harvey, 1999) also suggests that individuals can buffer themselves again negative stigma-related consequences through increased group identification. So, although increased group identification might lead to greater susceptibility to stereotype threat and related effects, it may also paradoxically buffer the negative affective consequences related to stigma. Tests of age-group identification with older adults are necessary to see not only whether age-group identification moderates susceptibility to stereotype threat in older adults, but also whether highly identified older adults experience less negative affective consequences in the face of stigma.

The second potential moderator in our study was a construct we call perceived stereotype threat (Chasteen et al., 2005). Perceived stereotype threat measures the extent to which individuals expect and perceive stereotyping against them. Thus far, it has been found that perceived stereotype threat is inversely related to older adults' memory performance, such that memory performance decreases as perceived stereotype threat increases (Chasteen et al., 2005). We modified the original measure of perceived stereotype threat in order to make a distinction between state (situational) and trait (dispositional) perceived stereotype threat. State perceived stereotype threat refers to the extent to which an individual expects and perceives stereotyping related to memory performance in the current situation; trait perceived stereotype threat is a measure of chronic awareness and expectancy of stereotyping in the domain of memory performance. As a dispositional measure, trait PST can be conceptualized as similar to stigma consciousness, the extent to which an individual tends to expect, perceive, and be influenced by negative stereotypes about one's group (Pinel, 1999).

## Predictions

Our first set of hypotheses refers to the main effect of our stereotype threat manipulation. We predicted that participants in the threat condition would perform worse on the memory tasks compared to participants in the no-threat condition. In terms of change in affect, we expected to see a decrease in positive affect for

those in the threat condition, with no change in positive affect for those in the no-threat condition. It was less clear whether we would see any change in negative affect for either condition, as older adults are known to report low levels of negative affect in general (Charles, Reynolds, & Gatz, 2001; Gross, Carstensen, Pasupathi, Tsai, Götestam-Skorpen, & Hsu, 1997; Mroczek, 2001). Thus, we thought that this might create a restricted range of responses where we would be unlikely to see a significant change in negative affect. If significant changes in did emerge, we expected that those in the threat condition would experience an increase in negative affect while those in the no-threat condition would experience no change in their level of negative affect.

In our second set of hypotheses, we expected the effects of our stereotype threat manipulation to be moderated by age-group identification and perceived stereotype threat. Stereotype threat effects should be most potent for those highly identified with the older adult age group or high in both state and trait perceived stereotype threat, compared with those who are low in these constructs.

## METHOD

### Participants and Design

Forty-two female older adults ($M_{age}$ = 71.14 years, range = 62-84 years) volunteered to participate in this study. In this experiment, we only included females because older females are known to be targeted much more often and severely by age-based prejudice than their male peers (Kite & Wagner, 2002). By only testing female participants, we controlled for any gender-related discrepancy in prejudice experience. All participants were recruited through the Adult Volunteer Pool in the Department of Psychology at the University of Toronto, St. George campus, and received $15 for their participation.

### Materials

#### *Age-Group Identification*

The age-group identification scale (Garstka et al., 1997) consists of 13 items assessing an individual's identification with their age group (e.g., "I value being a member of my age-group," "My age-group's successes are my successes"). Participants responded to the items on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The 13-item age-group identification scale had excellent internal consistency: Cronbach's $\alpha$ = 0.97. Participants completed the identification scale at home as part of a standard mailout sent to all new recruits to the Adult Volunteer Pool. The mailout contains several other unrelated measures used by the laboratories that sponsor the pool. All other measures and tasks were completed in our laboratory.

### *Current Affect*

Participants completed the 20-item Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) to assess current affect both before and after the experimental manipulation. The PANAS consists of 10 positive items (e.g., "I am proud," "I am excited"), and 10 negative items (e.g., "I am ashamed," "I am upset"). Responses to the items were made on a scale from 1 (*not at all*) to 4 (*very much*). Both administrations of the emotion scale had good internal consistency: pre-test Cronbach's $\alpha = 0.81$, and post-test Cronbach's $\alpha = 0.80$. In order to examine participants' affective reaction to the stereotype threat manipulation, change in negative affect and change in positive affect were computed by subtracting pre-test from post-test scores, with positive numbers reflecting increases in these emotions.

### *Prose Passage*

Participants were presented with a prose passage of approximately 650 words taken from Agatha Christie's (1972) novel *Elephants Can Remember*. This passage was used in an examination of older adults' memory bias for emotional information (Carstensen & Turk-Charles, 1994). In this passage, a godmother and her adult goddaughter discuss past and current social events and an interaction the godmother has with a mutual acquaintance. For analysis, this passage was divided into 56 information "chunks."

### *Recall Tasks*

Memory for the prose passage was assessed using tests of free, cued, and recognition recall. The free recall task asked participants to report everything they could about the content of the passage they had read earlier. Free recall responses were scored for the number of information "chunks" recalled out of a possible total of 56 chunks.

The cued recall task consisted of 15 short answer questions that asked participants to recall specific information about the characters and plot of the passage (e.g., "*What was the colour of the dress described in the passage?," "What is Mrs. Oliver's first name?").*

The recognition recall task consisted of 15 quotations taken from the passage. Participants were asked to identify the speaker of each quotation from a list of five options.

The appearance of memory task materials differed between the threat and no-threat conditions. In the threat condition, the materials were presented in formal test booklets and participants were asked to list their age and initials at the top of each page of each task. In the no-threat condition, the materials were presented in simple word processor format and participants were only asked to list their initials at the top of each page of each task.

### *Perceived Stereotype Threat*

Participants completed a seven-item measure to assess their perceptions of stereotype threat during the experiment. The perceived stereotype threat (PST) measure was initially adapted by Chasteen and her colleagues (2005) from Steele and Aronson (1995). We further modified the perceived stereotype threat measure in the present study in order to assess both state (situational) and trait (dispositional) perceptions of stereotype threat. Responses were made on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Analyses were conducted with a four-item measure of state PST (e.g., "*Today I felt the experimenter expected me to do poorly because of my age*") and a three-item measure of trait PST (e.g., "*In general, people often underestimate my memory ability because of my age*"). Both of these scales had good internal consistency: state PST Cronbach's $\alpha = 0.86$, and trait PST Cronbach's $\alpha = 0.81$.

### *Other Measures*

Basic demographic information including education level and self-rated physical health was collected via a standard demographic questionnaire. In addition, participants completed a series of items to assess cognitive ability including the Shipley vocabulary test (Shipley, 1940), a digit comparison task, and a verbal fluency task, which served as filler tasks.

## Procedure

Participants who had completed the mail-out questionnaire were brought into the laboratory for the main portion of the study. Participants were randomly assigned to either the threat ($n = 20$) or no-threat ($n = 22$) condition. Those in the threat condition participated along with a female young adult confederate; participants in the no-threat condition participated in same-age pairs. Therefore, all participants participated in this experiment in same-gender pairs. In the threat condition, the confederate was instructed to act as though she was completing all of the tasks at the same time as the older adult.

### *Threat Condition*

To create our stereotype threat manipulation, we used methods devised in prior research (Inzlicht & Ben-Zeev, 2000; Schmader & Johns, 2003), including having participants list their age on the memory tasks, completing the task in the same room as a young adult confederate, and telling them that the tasks are diagnostic of memory ability. When welcomed to the laboratory, participants were told that they would be participating in a study involving a reading comprehension task that would be diagnostic of their memory ability. Participants were specifically told that we were interested in their ability to remember the information contained in the passage they would read. Participants then read and completed the consent form.

After hearing some general experimental instructions, participants' current affect was assessed using the PANAS. Next, participants were presented with the prose passage and were told that their memory for the passage would be tested later. Participants were allowed 6 minutes to read the passage; for this and all other tasks, participants in the threat condition were timed conspicuously with a stopwatch.

Next, participants completed the cognitive tasks during a 15-minute filler time period. After the filler tasks, participants completed the memory tasks, which included measures of free recall, cued recall, and recognition recall. Before each section, participants were told that they were completing a memory test that would measure how much they were able to remember about the passage they had read earlier. Participants were given 5 minutes to complete each recall task and were asked to write down their age and initials at the top of each page of the booklet.

Immediately following the recall tasks, participants completed the PANAS for the second time. Following this, participants completed the perceived stereotype threat measure. Finally, participants completed a suspiciousness check and a demographics sheet. Participants were then debriefed verbally and given a debriefing sheet to read. At this time, the confederate left the room so that the older adult would have the opportunity to privately ask questions if she so desired. The experimenter answered the participants' questions if asked, and the participant was then compensated, thanked, and dismissed.

### *No-Threat Condition*

A similar procedure was used in the no-threat condition, with the following exceptions. When welcomed to the laboratory, participants were told that they would be participating in a study involving reading comprehension and impression formation. Participants were specifically told that we were interested in their thoughts and opinions about the passage they would read. In contrast to participants in the threat condition, participants in the no-threat condition were timed inconspicuously with a normal wrist watch.

For the memory tasks, participants were told that they were completing reading comprehension tasks that would help us to learn more about their thoughts and opinions about the contents of the passage they had read a few minutes before. Participants in the no-threat condition were only asked to write down their initials at the top of each page of the booklet. All other procedures were identical to the threat condition.

## RESULTS

Before testing our hypotheses, we conducted a series of independent samples *t*-tests to ensure that our threat and no-threat groups did not differ according to education level, physical health status, or cognitive ability. There were no

differences between conditions for any of these variables, all *p*s > .20. Participant characteristics are presented in Table 1 by experimental condition.

The following analyses explore the dependent variables of interest in this study, as well as the potential moderators of the stereotype threat effect. Our primary dependent variable of interest, recall performance, was assessed in three different ways using tasks of free, cued, and recognition recall. Our other dependent variable of interest was participants' affect from pre to post experimental manipulation. Our main independent variables of interest were the stereotype threat manipulation, age-group identification, and perceived stereotype threat. Of the variables, stereotype threat, or the condition manipulation, was treated categorically, while all other independent variables were treated continuously and examined using regression analyses.

## Stereotype Threat Main Effects

Before examining potential moderators of stereotype threat effects in older adults, we first wanted to establish that our manipulation of stereotype threat was effective. To do this, a series of *t*-tests were conducted on the recall and affect data, with all tests being two-tailed. The stereotype threat manipulation had a

Table 1. Participant Characteristics by Condition

| | Condition | |
|---|---|---|
| Variable | No-threat | Threat |
| Age (years) | 71.5 | 70.8 |
| Education (years) | 15.1 | 15.4 |
| Self-rated physical health | 4.3 | 4.1 |
| Vocabulary | 35.7 | 36.2 |
| Digit comparison | 115.0 | 121.8 |
| Verbal fluency | 12.0 | 12.4 |

**Note**: Physical health was rated on a scale from 1 (*very poor*) to 5 (*excellent*). The Shipley vocabulary test requires participants to match a target vocabulary word (e.g., *pariah*) with a synonym from a list of four options (e.g., *outcast, priest, lentil, locker*); the maximum score on the Shipley vocabulary test is 39. The digit comparison task required participants to judge strings of three or six numbers as either the same or different; participants were given 5 minutes to complete as many digit comparisons as they could. In the verbal fluency task, participants were presented with a letter and asked to list as many words as possible that start with that letter, excluding proper nouns, numbers, and the same word with a different suffix (e.g., wave and waves). Participants were presented with three letters, F, A, and N, and were given 90 seconds to work on each letter; the score provided above represents the mean number of words produced across letters.

significant effect on participants' free recall performance (maximum recall = 56 chunks), $t(40) = 2.20$, $p < .05$, $d = 0.68$, such that participants in the threat condition ($M = 6.30$, $SD = 3.47$) recalled less than those in the no-threat condition ($M = 8.59$, $SD = 3.29$).

No significant main effects of the stereotype threat manipulation were found for the other two measures of recall, cued, $t(40) = 0.53$, $p = 0.60$, $d = 0.16$, and recognition, $t(40) = 0.61$, $p = .54$, $d = 0.19$, recall performance.

Participants' affect data were analyzed for changes in positive and negative emotions from before to after the experimental manipulation. As hypothesized, participants in the threat and no-threat condition did not differ in the extent to which they experienced a change in negative emotions, $t(40) = 0.62$, $p = .54$, $d = 0.19$. In terms of change in positive affect, there was a trend in the hypothesized direction, suggesting that those in the threat condition ($M = –0.31$, $SD = 0.59$) may have experienced more of a decrease in positive emotions than those in the no-threat condition whose levels of positive affect appeared largely unaffected by the experimental manipulation ($M = –0.06$, $SD = 0.41$), $t(40) = 1.58$, $p = .12$, $d = 0.49$.

## Analytic Strategy

Hierarchical linear regression analyses were used to test the predictive value of the independent variables on each dependent variable of interest. In each case, condition (threat or no-threat) and the independent variable in question were entered in step 1 to assess main effects. Condition was entered using a dummy-coded variable (0 = no-threat, 1 = threat). The interaction between condition and each independent variable was added in step 2. In all cases, *z*-score standardized values of the continuous independent variables were used (Jaccard, Turrisi, & Wan, 1990). Post-hoc tests were used to determine the source of significant interactions.

## Age-Group Identification

Because one participant in the no-threat condition did not complete the age-group identification scale, analyses are based on 21 participants in the no-threat condition and 20 participants in the threat condition. Scores on the age-group identification scale ranged from 1 to 7 with a mean of 4.75 ($SD = 1.66$). Age-group identification scores of participants assigned to the threat ($M = 4.86$, $SD = 1.51$) and no-threat ($M = 4.64$, $SD = 1.82$) conditions did not differ, $t(39) = 0.430$, $p = 0.67$, $d = 0.14$.

### *Age-Group Identification and Memory Performance*

We expected that stereotype threat effects would be most potent for those highly identified with the older adult age group. Although we did find that free

recall performance decreased as a function of age-group identification, β = –.26, $p$ = .09; Step 1: $R^2$ = 0.18, $p$ < .05, such that free recall performance decreased as identification with the older adult age group increased, no interaction with condition was found, β = –0.08, $p$ = 0.68; Step 2: $\Delta R^2$ = 0.01, $p$ = .68. There were no significant effects for the other two memory tasks, $p$s > .14.

### *Age-Group Identification and Change in Affect*

A significant effect for the condition by age-group identification interaction emerged for the dependent variable change in negative affect, β = –0.47, $p$ < .05; Step 2: $\Delta R^2$ = 0.13, $p$ < .05. In the threat condition, there was no relationship between age-group identification and negative affect, β = –0.33, $p$ = .16; in the no-threat condition, participants experienced a marginal increase in negative affect as age-group identification increased, β = 0.42, $p$ = .06.

## State Perceived Stereotype Threat

Mean state PST scores ranged from 1 to 5, with a mean of 1.89 ($SD$ = 1.03). Participants' levels of state-based perceived stereotype threat did not differ between the threat ($M$ = 1.76, $SD$ = 1.11) and no-threat ($M$ = 2.00, $SD$ = 0.96) conditions, $t$(40) = 0.742, $p$ = 0.46, $d$ = 0.23.[1]

### *State Perceived Stereotype Threat and Memory Performance*

Analyses revealed the hypothesized significant effect of state PST on cued recall when collapsed across condition, β = –0.41, $p$ < .01; Step 1: $R^2$ = 0.17, $p$ < .05. Specifically, as state PST increased, cued recall performance decreased. Also consistent with predictions, a trend for the condition by state PST interaction also emerged, β = –0.37, $p$ = .09; Step 2: $\Delta R^2$ = 0.06, $p$ = .09. As shown in Figure 1, participants in the threat condition experienced a decline in cued recall as state PST increased (β = –0.57, $p$ < .01) while cued recall performance for those in the no-threat condition remained stable as state PST increased, β = –0.16, $p$ = 0.48. As for free recall, the pattern of results for the main effect of state PST was similar to the significant main effect observed for cued recall, but was a marginal trend, β = –0.26, $p$ = .09. The interaction with state PST was not significant for free recall, $p$ > .53. No significant effects emerged for the recognition memory task, $p$s > .20.

[1]The state and trait PST measures were significantly correlated, $r$ = 0.36, $p$ < .05. Analyses covarying each PST measure from the other yielded an identical pattern of results.

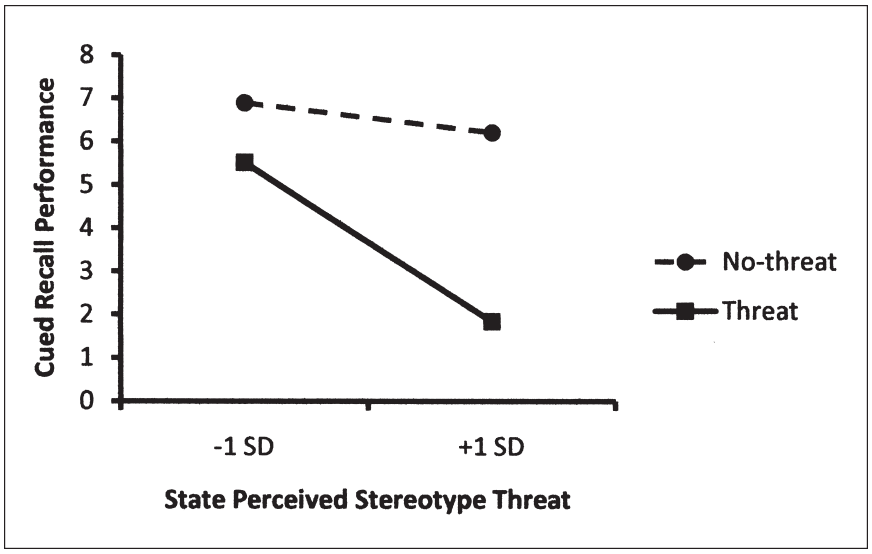


Figure 1. Performance on a 15-item cued recall task as a function of state (situational) perceived stereotype threat by condition.

*State Perceived Stereotype Threat and Change in Affect*

There were no significant effects for changes in either positive or negative affect as a function of state PST, *p*s > .22.

## Trait Perceived Stereotype Threat

Participants' mean levels of trait, or chronic, PST ranged from 1 to 5, with a mean of 2.67 (*SD* = 1.09). Trait-based levels of perceived stereotype threat did not differ between the threat (*M* = 2.78, *SD* = 0.66) and no-threat (*M* = 3.01, *SD* = 0.73) conditions, $t(39) = 1.05$, $p = 0.30$, $d = 0.33$.

*Trait Perceived Stereotype Threat and Memory Performance*

As expected, with increased trait PST, performance on the free recall task decreased, $\beta = -0.41$, $p < .01$; Step 1: $R^2 = 0.27$, $p < .01$. No interaction with condition was found, $\beta = -0.19$, $p = .30$; Step 2: $\Delta R^2 = 0.02$, $p = .30$.

However, a significant condition by trait PST interaction was found for the cued recall task, $\beta = -0.41$, $p < .05$; Step 2: $\Delta R^2 = 0.10$, $p < .05$. In the threat condition, cued recall performance marginally decreased as trait PST increased ($\beta = -0.43$, $p = 0.06$). In the no-threat condition, cued recall performance remained stable as

trait PST increased (β = 0.13, $p > .57$). This relationship is shown in Figure 2. No significant effects emerged for the recognition memory task, $p$s > .12.

*Trait Perceived Stereotype Threat and Change in Affect*

Also as hypothesized, a significant condition by trait PST interaction was also found for participants' change in positive affect, β = –0.56, $p < .01$; Step 2: $\Delta R^2$ = 0.18, $p < .01$. As shown in Figure 3, those in the threat condition experienced a decrease in positive affect from pre to post stereotype threat manipulation as trait PST increased (β = –0.58, $p < .01$). In the no-threat condition, positive affect remained stable (β = 0.22, $p > .33$).

## DISCUSSION

One goal of this study was to examine the strength of stereotype threat effects on older adults. We did this by using more subtle situational cues than have been used in previous research, such as having a younger fellow participant in the room, and varying the formality of the memory tasks. We also tested the generalizability of the effect by examining other tests of memory in addition to free recall, which has been the most common performance measure. When considering the effects of our stereotype threat manipulation in isolation, we found that older adults under threat performed more poorly on a test of free

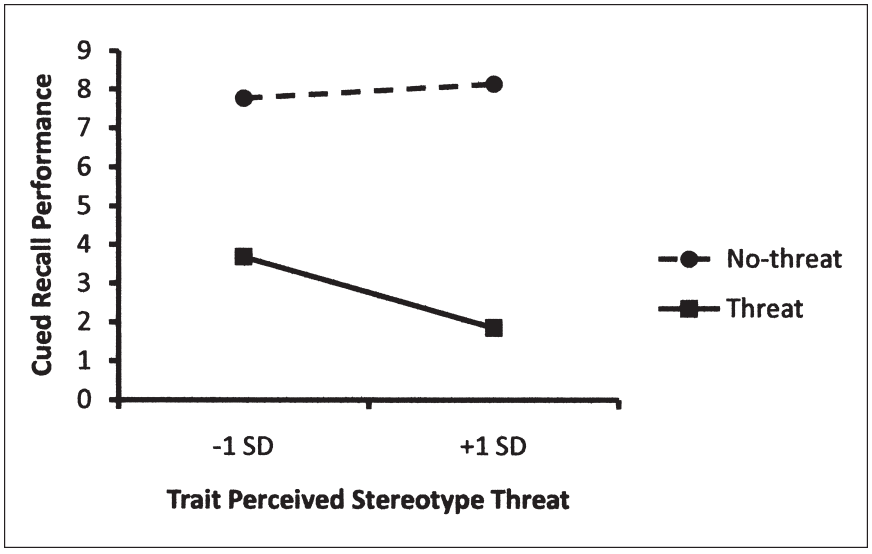


Figure 2. Performance on a 15-item cued recall task as a function of trait (dispositional or chronic) perceived stereotype threat by condition.

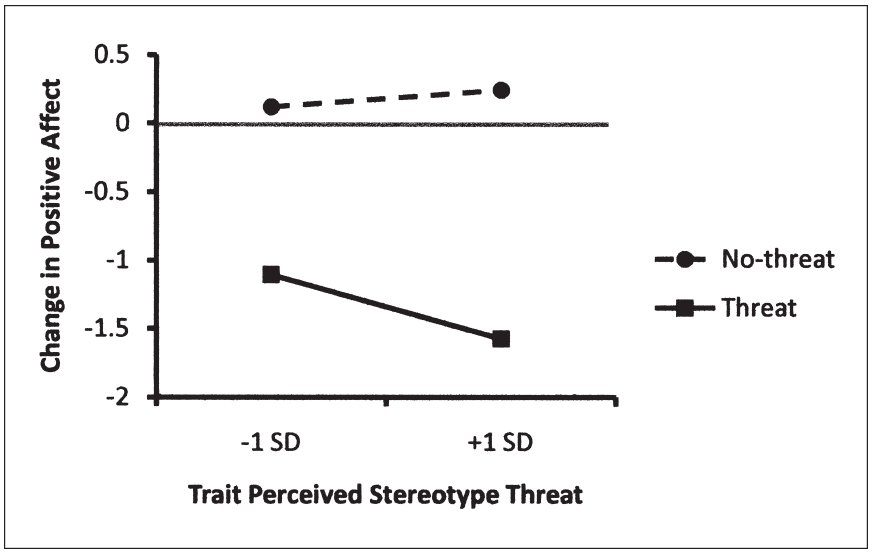


Figure 3. Change in positive affect from pre to post experimental manipulation as a function of trait (dispositional or chronic) perceived stereotype threat by condition. A zero value would indicate no change in positive affect from pre to post experimental manipulation. Positive values indicate an increase in positive affect; negative values indicate a decrease in positive affect.

recall performance than those not under threat (Hess et al., 2003). However, this main effect of condition did not extend into tasks of cued and recognition recall performance, perhaps because these tasks did not represent an adequate level of difficulty for our participants. Indeed, other researchers have shown that stereotype threat disrupted women's math performance on difficult, but not easy, tests of mathematic ability (Spencer, Steele, & Quinn, 1999).

A second goal was to test potential moderators of the stereotype threat effect. One potential moderator of interest in our study was age-group identification, the degree to which older adults identified with the older adult age group. To our knowledge, this is the first time that identification with one's age group has been considered as a potential moderator of stereotype threat effects in older adults (cf. O'Brien & Hummert, 2006, an examination of age-group identification as a moderator of stereotype threat among late middle-aged adults). Our results showed that age-group identification was associated with recall performance, such that the more that older adults identified with their age group, the lower their recall performance. This result was independent of stereotype threat condition, suggesting that perhaps those older adults who are experiencing memory failures turn to their fellow seniors for support, a notion

consistent with the rejection-identification model (Branscombe et al., 1999). The rejection-identification model posits that individuals can buffer some of the negative consequences associated with belonging to a stigmatized group by increasing their identification with that group and, in turn, increasing the positive benefits of strong group identification. Indeed, identification with their age group can help older adults cope with negative consequences associated with perceived age discrimination (Garstka, Schmitt, Branscombe, & Hummert, 2004). We suggest that this model may also be applied to the negative effects of self-related threats such as memory decline, which might also be buffered by increased group identification. Thus, it may be that those older adults who are threatened by the experience of memory decline might turn to fellow older adults for support and, thus, increase their levels of group identification.

An alternative explanation for this result may be that strongly identified older adults are simply more vulnerable to stereotypical declines in memory performance. This explanation would be in line with previous research showing that highly gender-identified women are more susceptible to stereotype threat effects in the domain of math performance (Schmader, 2002). Given that our results showed lower memory performance for highly age-identified older adults regardless of condition, it may be the case that strongly identified older adults are simply more sensitive to cues that their group is devalued, whether these cues are obvious, as in the threat condition, or benignly ambiguous, as in the no-threat condition. Because our experiment was not designed to test these two explanations, we will have to leave this clarification to future research.

In addition to examining the role that age group identification plays, we also examined whether state (situational) and trait (dispositional) perceived memory-related stereotype threat moderated stereotype threat effects on memory performance. We found that both state and trait threat perceptions influenced threat effects, particularly for cued recall performance. For both types of perceived stereotype threat, there was a steeper decline in cued recall performance with increased perceived stereotype threat among participants in the threat condition. This effect may not have generalized to the recognition task because of the relative ease of this task. As explained earlier, the stereotype threat effects might not have affected performance on this easy task. On the other hand, we also did not see this interaction emerge on the relatively difficult free recall task. This discrepancy may be due to the nature of the free recall task itself. Because scores on the free recall task were determined through a more subjective coding process, there may have been greater variability and noise associated with that measure compared with the cued recall task. Indeed, the pattern for the free recall task was in the same direction as what was found for the cued recall task, with participants in the threat condition showing a decline in recall performance with increased state perceived threat. Despite the discrepancy between the memory tasks, these results demonstrate that both situational and chronic perceptions of stereotype threat have a negative effect on older adults' cognitive task

performance. The idea of chronic perceived stereotype threat is particularly interesting in that it suggests the existence of especially stereotype-threat prone individuals, the very individuals who might benefit the most from stereotype threat interventions.

A third goal of this study was to determine the specific emotional effects of stereotype threat on older adults. Our results revealed that, consistent with the rejection identification model, identification with the older adult age group buffered those in the threat condition from experiencing an increase in negative affect in response to the stereotype threat manipulation. Because those in the no-threat condition did not experience a similar threat experience, it seems that group identification processes were not activated to protect participants' affective state. These results are the first to show that age-group identification can buffer the negative emotional consequences of stereotype threat, and lend greater support to the application of the rejection-identification model to older adults.

It is also conceivable that socioemotional selectivity (SES) theory (Carstensen, 1995), may help to account for our findings regarding age group identification and emotion. SES theory suggests that as they age, individuals focus on relationships and experiences which maximize social and emotional gains and minimize risks. This bias for positive relationships and experiences may account for why older adults experience less negative emotions than their younger counterparts (Gross et al., 1997). It may be the case that those older adults who are strongly identified with their age group tend to be those who are most attuned to positively valenced information. More specifically, chronological age might not be the only requisite for the positivity bias; instead, the degree to which individuals identify with their age group may also play a role. If one is strongly identified with the older adult age group, it suggests that they have accepted their status as an older adult and, most likely, hold positive views of this group. These strongly identified older adults may thus be the most likely to attend more to positive aspects of the environment, even in a threatening situation. This would explain why these older adults are less upset in a threatening situation than those less identified with the older adult age group. In the future, we might ask older adults to report what aspects of the situation contributed to their ratings of positive and negative emotions. It may be the case that highly identified older adults remember more positive aspects of the testing situation itself, and are therefore less likely to have experienced an increase in negative emotions. It also may be the case that highly identified older adults have a positivity bias even in their own emotions, such that their attention is focused solely on their positive emotions, and these are the emotions they are more likely to report.

We note also that the emotions data provide support for our measure of trait perceived stereotype threat. We found that those in the threat condition experienced a decrease in positive affect as trait (dispositional) perceived stereotype threat increased. This evidence indicates that our perceived stereotype threat measure serves as a good index of feelings of threat.

## Implications and Future Directions

The results of this study support the general finding that stereotype threat disrupts performance of stereotyped individuals on stereotype relevant tasks. These results could be further specified by focusing on the idea of "transitioning" into the older adult age group. For example, as with middle-aged adults (O'Brien & Hummert, 2006), it is likely the case that only older adults who recognize and accept their older adult status would be affected by such phenomena as priming, self-stereotyping, and stereotype threat. Indeed, Levy (2003) posited that two prerequisites need to be met in order for age stereotypes to have an effect on older adults. First, older adults must objectively join the old age membership group. This usually entails reaching a certain age arbitrarily determined by one's society as constituting status as a senior. The second, and theoretically more important step, involves actual identification with group members. This requires individuals to actively think about themselves as an older adult. These two prerequisites rarely occur at the same time; instead, the second prerequisite is often met years after the first. Levy asserts that only those who identify with the old age group will be affected by age stereotypes and research shows that older, but not younger, adults are affected by negative old age primes (Levy, 1996) and that only middle-aged adults who have begun transitioning to the older adult group are affected by age-based stereotype threat (O'Brien & Hummert, 2006). However, other researchers (Bargh, Chen, & Burrows, 1996) have shown that young adults can also be primed to conform to old age stereotypes. These findings raise interesting questions for work on old age stereotypes in general. Is it really the case that "you are only as old as you feel," or does this subjective "feeling," or identification, really play any role? Further research with middle-aged adults may shed some light on this issue as well as on issues underlying age-group identification. For example, what factors lead some middle-aged adults to transition quickly and easily into the old age group while others resist and continue identifying with a younger age group almost indefinitely? It is clear that there remains much to be learned about the influence of age-group identification on the processes of stereotype threat and self-stereotyping.

The results of this research have significant implications for the treatment of older adults. Because negative aging stereotypes and, therefore, stereotype threat, are so prevalent in our society (Kite, Stockdale, Whitley, & Johnson, 2005), it is important to take steps, as we have done here, to identify those who are most vulnerable to the deleterious effects of these phenomena. Once these individuals have been identified, intervention techniques can be implemented to combat these debilitating effects. For example, in future work, it would be interesting to see if our age-group identification results are moderated by an individual's beliefs about older adults. For example, someone who is highly identified with the older adult age group and has a positive view of older adults would probably be less affected by stereotype threat than an individual who is highly identified

with the older adult age group but views the group negatively. This finding also highlights the potential of in-group affirmation to reduce the effects of stereotype threat. Research with gender stereotypes (McIntyre, Paulson, & Lord, 2003) has shown that making positive group achievements salient helps to alleviate the negative effect of stereotype threat on women's math performance. A similar intervention with older adults may also help to inoculate this group against stereotype threat.

In conclusion, the present study is the first to examine stereotype threat effects among older adults using subtle situational cues similar to those encountered in everyday life. This study also adds to the small body of research which attempts to identify older adults most susceptible to stereotype threat. Our results show that one of our variables of interest, age-group identification, is not only associated with recall performance, such that older adults who identify strongly with their age-group experience a steeper decline in recall performance, but also seems to buffer some of the negative affective consequences associated with stereotype threat. These results suggest that future research should aim to more clearly elucidate the role of age-group identification in stereotype threat among older adults. Finally, our results highlight the unique nature of age-based stigma and point to the need for more research on this important topic.

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