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### **Domain Specific Effects of Stereotypes on Performance**

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Domains Specific Effects of Stereotypes on Performance

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### Abstract

We report the results of an experiment mirroring an earlier study finding that Asian-American women performed better on a math test when their Asian identity was salient and worse when their female identity was salient (Shih et al., 1999; Ambady et al., 2001; and Shih et al., 2002). In this paper, we assessed the performance of Asian-American women on a verbal test, a situation in which the valence of the stereotypes associated with the same two identities (i.e. Female, Asian) are flipped. Consistent with stereotypes, women performed better on the verbal test when their female identity was made salient than when their Asian identity was made salient. These results, taken together with the previously reported findings, indicate that identities are not universally adaptive or maladaptive, but rather are adaptive or maladaptive in different domains.

## Effects of Social Identity and Stereotypes on Performance: Global or Domain-Specific?

A large and growing body of work on stereotype threat demonstrates that negative performance stereotypes about a group harm the performance of members of that group when these stereotypes are salient (Steele & Aronson, 1995; Steele, 1997). This effect has been found in a variety of social identity groups and in a variety of performance domains. For example, African-American students underperform on math and verbal tasks when their stigmatized identity is made salient (Steele & Aronson, 1995); women underperform on mathematics tasks and in negotiations (Spencer, Steele, & Quinn, 1999; Quinn & Spencer, 2001; Kray et al., 2001; Stone et al. 1999); and people from poor socioeconomic backgrounds underperform on tests of intellectual ability (Croizet & Claire, 1998).

Stereotype threat researchers propose that negative stereotypes harm performance by introducing additional anxiety into a test-taking situation (Steele & Aronson, 1995). Research has found that African-American students under threat conditions show physiological signs of elevated anxiety (Blascovich, Spencer, Quinn, & Steele, 2001). High levels of anxiety can undermine performance (Osborn, 2001). Anxiety about confirming a negative stereotype increases motivation on a task and alters the types of problem-solving strategies individuals use in a way harmful to performance. Highly motivated individuals tend to focus on central features of a task and ignore peripheral features (Easterbrook, 1959). Under stereotype threat, evidence suggests that people fixate on a single problem-solving strategy and become unable to generate alternative approaches to problems when their initial approach fails (Quinn & Spencer, 2001).

More recently, researchers have found that negative stereotypes not only disadvantage individuals directly by undermining their performance, but may also cause indirect harm. The stereotype lift literature finds that individuals exposed to negative stereotypes about another group show a small but reliable increase in their own performance (Walton & Cohen, 2003), increasing the difference in performance levels between negatively stereotyped and non-stereotyped individuals.

In sum, both stereotype threat and stereotype lift research (a) focus on negative stereotypes and (b) study a social identity's effects on individual performance in a single domain, implicitly suggesting that a social identity associated with negative stereotypes is maladaptive to members of that group. In this study, we examine the possibility that the social identities which stereotype threat and lift research have demonstrated to be often maladaptive may not, in fact, be universally maladaptive, but only maladaptive in the specific domains studied so far.

### Positive Stereotypes and Performance

There has been relatively little work on the impact of positive stereotypes on performance. While the stereotype threat and stereotype lift literature find that negative stereotypes hurt performance, there is accumulating evidence from stereotype susceptibility research that positive stereotypes can boost performance (Ambady, Shih, Kim, & Pittinsky, 2001; Levy, 1996; Shih et al., 1999).

In one representative study, Asian-American females performed better on a quantitative reasoning test when their Asian identity (associated with positive stereotypes for quantitative performance) was made salient and worse when their gender identity (associated with negative stereotypes for quantitative performance) was made salient,

compared to a control group for whom no social identity was made salient (Shih et al., 1999).

As discussed earlier, the mechanism most commonly found for the effects of negative stereotypes is anxiety (Steele, 1997). In contrast, evidence suggests that positive stereotypes may boost performance through ideomotor processes (Dijksterhuis & Bargh, 2001), a different process than that by which negative stereotypes hurt performance. Wheeler and Petty (2001) describe the ideomotor process as a “cold” process, one that occurs automatically, outside of conscious awareness. Ideomotor processes occur through the perception-behavior expressway, the overlapping cognitive representations for stereotype schemas and behavior. When a person is exposed to a positive stereotype and the stereotype schema is activated, stereotype-consistent behavior will also be automatically activated. Mere exposure to positive stereotypes about aging, for example, can boost memory in the elderly (Levy, 1996).

To review, the stereotype threat and stereotype lift literatures find that negative stereotypes can be maladaptive, undermining the performance of members of the stereotyped group while boosting the performance of others. The stereotype susceptibility literature finds that positive stereotypes can be adaptive to members of the stereotyped group, enhancing their performance. In each of these literatures, studies have been conducted in a single domain, so it remains unknown whether the activated social identities are globally adaptive or maladaptive across domains or adaptive and maladaptive in specific domains.

Maladaptive and Adaptive Identities: Global or Domain-Specific?

Some studies have begun to examine the relationship between social identity, stereotypes, and performance in more complex ways. Kray et al. (2001) studied the effects of the salience of a single social identity, in a single performance domain, following the introduction of a new stereotype. Shih et al. (1999) examined the salience of two distinct social identities in a single performance domain. The study of the global or domain-specific nature of the effects of social identity and stereotypes on performance is the logical next step.

If the effects of social identity salience are domain-specific, then the salience of an identity that undermines performance in one domain might have no effect, or even boost performance, in another domain. The salience of an identity that boosts performance in one domain might have no effect, or even undermine performance, in another domain.

One possibility—that the effects of social identity and stereotypes on performance are global and not domain-specific—is suggested not only by the social psychological work on stereotype threat and stereotype lift, but by classic sociological theories of stigma. Goffman, for example, writes that members of stigmatized groups possess an identity that is “deeply discrediting.” When an individual has a stigmatized social identity, the stigma can extend across different situations, “break[ing] the claim that his other attributes have on us” (Goffman, 1963).

To date, however, the specificity of these effects has never been directly tested. Research on the effects of social identity and stereotypes on performance has been restricted to single domains of performance (e.g. Steele & Aronson, 1995; Stone, et al., 1995). These studies, by focusing on only one domain, leave the impression that the

effects of stereotypes might be domain specific. Evidence for the possibility of domain-specific effects of social identities and stereotypes on performance can be found in the research and theory on framing effects. Studies have found that framing tasks differently can lead to different performance outcomes (e.g. Brown & Josephs, 1999; Kray, Thompson, & Galinsky, 2002; Stone et al., 1999). These studies made salient different aspects of the task rather than different aspects of the self. For example, Stone et al. (1999) framed the same sports task as a test of either athletic ability or mental acuity. Thus, these studies do not directly test whether the salience of an identity that leads to decreased performance in one domain might have no effect, or even a positive effect, on performance in another domain. They do, however, suggest that the possibility warrants study.

### The Present Study

The present study addresses two issues pertaining to stereotypes, social identity, and performance. First, we contribute to the growing body of stereotype susceptibility literature by studying the adaptive effects of positive stereotypes in a domain in which they have not yet been studied: verbal skills. Second, we test the hypothesis that the adaptiveness of a social identity may be specific to performance in the domain about which the stereotypes exist. We expect that identities which have been observed to threaten performance in one domain because they are associated with negative stereotypes about performance in that domain can, in fact, be adaptive and facilitate performance in a different domain in which they are associated with positive stereotypes.

To test these hypotheses, we designed a study to mirror earlier studies reported in the literature—Shih et al. (1999), Ambady et al. (2001), and Shih et al. (2002)—making

one important change. The respective salience of the same two identities (i.e. Female, Asian) was studied, but in a performance domain in which the valence of the stereotypes associated with two identities (i.e. Female, Asian) are flipped. Specifically, we examine the effects of identity salience on verbal reasoning rather than mathematical reasoning. In the study we mirrored, female gender identity was associated with the negative stereotype that women have inferior mathematical reasoning skills. In the present study, female gender identity is associated with the positive stereotype that women have superior verbal reasoning skills. Similarly in the study we mirrored, Asian ethnic identity was associated with positive stereotype that Asians have superior mathematical reasoning skills. In the present study, Asian ethnic identity is associated with the negative stereotype that Asians have inferior verbal reasoning skills.

To summarize in the present study, we examine two social identities – Asian and Female - for which facilitative and debilitating effects, respectively, have been documented in the domain of mathematical reasoning. But we study the salience of these identities in the verbal reasoning domain, in which the opposite predictions would be made based on the stereotypes associated with these social identities. If the influences of social identities on performance are domain-specific, we should see the opposite pattern of performance effects from that seen in Shih et al.,1999. Specifically, we would expect improved performance when gender is made salient, and diminished performance when ethnicity is made salient. On the other hand, there is a remote chance that performance pattern observed in Shih et al. 1999 was a result of the influence of these identities being globally positive or negative. If that were the case, then we would expect the pattern of performance to be the same as the pattern we observed in Shih et al., 1999. In this way,

we examine whether the influences of stereotypes on performance on both mathematical and verbal domains are domain-specific or global.

### Method

Participants. Asian-American female undergraduates (n=51) were run in this experimental study in exchange for monetary compensation.

Design and Manipulation. Participants were randomly assigned to one of three conditions: Asian identity salient, female identity salient, or no identity salient. For direct comparability, identity salience was manipulated using the same method reported in Shih et al. (1999). In the female identity salient<sup>1</sup> condition, participants were asked to complete a student life survey asking them identify their sex and answer gender-related questions: (a) whether they lived on or off campus; (b) whether they had a roommate; (c) whether they lived in a coed or single-sex environment; (d) whether they preferred to live in a coed or single-sex environment; and (e) to list three reasons why they would prefer a coed floor or a single-sex floor. In the Asian identity salient condition, participants completed a student life survey asking them to identify their ethnicity and to answer ethnicity-related questions: (a) how many generations their family lived in America; (b) their family's country of origin; (c) a rating of the degree to which food from their ethnic heritage was a part of their upbringing; (d) whether they were involved with any student organizations; and (e) the name of the organizations in which they were involved. In the no identity salient condition, participants completed a student life survey asking questions about aspects of young adult life unrelated to gender or ethnicity: (a) how often they watch television; (b) whether or not they subscribe to cable television services; (c) frequency with which they ate out; and (d) their frequency of movie attendance.

Procedure. When participants arrived for the study, they were greeted by an experimenter blind to the participants' assigned experimental condition. The participants were asked to complete one of the three manipulation questionnaires. After participants completed the manipulation questionnaire, they were then asked to take a verbal skills test. Participants did not know that they would be taking a verbal test until this point.. The test questions were drawn from a published Graduate Record Examination (GRE) study guide<sup>2</sup>. After the allotted time for test completion, participants completed a final questionnaire providing personal background information including their age, major, ethnicity, year in school, their verbal SAT score, as well as their thoughts about the goals of the experiment. None of the participants guessed the goals of the research. They were also asked to answer the following items on a scale of 1 (not at all) to 7 (very much): a) how well do you think you did on the verbal test, b) how confident are you in your answers on the verbal test, c) how much did you enjoy the experiment, d) how talented do you think you are verbally, e) how much would you like to do another similar experiment, f) how difficult was the test, g) how important was it for you to do well on the test and h) how much do you enjoy reading. Participants were then paid and debriefed.

### Results

A three condition one-way ANOVA covarying out SAT scores revealed a significant main effect for condition,  $F(2, 49) = 4.67, p < .05$ . Participants in the Female identity salient condition ( $M = 8.64; SD = 3.01$ ) answered significantly more questions correctly than participants in the Asian salient condition ( $M = 6.46; SD = 2.88$ ),  $t(49) = 2.77, p < .01, r = .28$  one-tailed. Participants in the Female identity salient condition also answered more questions correctly than participants in the Control condition, ( $M = 7.64;$

$SD = 2.50$ ). This comparison was approaching significance,  $t(49) = 1.60$ ,  $p < .06$  one-tailed. Finally, participants in the Control condition answered more questions correctly than participants in the Asian identity condition. This comparison was also approaching significance,  $t(49) = 1.67$ ,  $p = .052$  one-tailed.

Participants across all three conditions did not show any significant differences in the number of questions attempted ( $F < 1$ ), or their accuracy in these questions ( $F(2, 49) = 2.03$ ,  $p > .14$ ). Although the means for accuracy did follow the same pattern as the means for number correct with participants in the female identity salient condition showing the highest accuracy, and participants in the Asian identity salient condition showing the lowest and participants in Control condition falling in between the two experimental conditions (Female  $M = .67$ ,  $SD = .17$ ; Control  $M = .63$ ,  $SD = .17$ ; Asian  $M = .57$ ,  $SD = .18$ ).

Finally, examination of the measures in the final questionnaire revealed no differences among the conditions in how talented they believed they were verbally ( $F < 1$ ), how interested they were in reading ( $F < 1$ ), how much they enjoyed the experiment ( $F < 1$ ), or how much they would like to participate in a similar experiment in the future ( $F < 1$ ), how difficult the test was for them ( $F < 1$ ), how important it was for them to do well on the test ( $F < 1$ ) or how confident participants reported being in their answers ( $F(2,49) = 2.51$ ,  $p < .10$ ),

## Discussion

In this study, we found that Asian-American women performed better on a verbal reasoning test when their female identity was made salient and worse when their Asian identity was made salient. These results, taken together with the results from earlier

studies (e.g. Shih et al., 1999) supports and extends our understanding of stereotypes, social identity and their effects on performance. While past research has shown that priming different identities alters performance in a given domain, this is the first study to show that the same identity (i.e. female or Asian) can be associated with performance boosts in one domain (i.e. female in verbal; Asian in math) and performance deficits in another domain (i.e. female in math; Asian in verbal). These results suggest that the consequences associated with social identities are domain specific, rather than universal or global. For instance, while previous studies have found that activating Asian identity improves performance in the math domain, in this study, we find Asian identity hurts performance in a verbal domain. Conversely, while previous studies have found that activating female identity hurts performance in the math domain, we find that the female identity boosts performance in the verbal domain. Thus, it is not the case that the Asian identity has a positive impact in all performance domains, nor is it the case that the female identity has a negative impact in all performance domains. An identity that boosts performance in one domain can undermine performance in another domain and vice versa.

Consistent with previous work, the present findings suggest that the salience of social identities about which there are positive stereotypes can raise performance compared to the salience of social identities about which there are negative stereotypes. It is interesting to note that the differences between the control and the experimental conditions, although not significant at the .05 level, were coming extremely close to significance at  $p = .052$  and  $p = .058$ . A number of possibilities exist to account for these findings. First, it might be possible that if more power were to be added to the study with

the addition of more participants, that these trends would reach significance and that performance in both experimental conditions would be significantly different from control. Alternatively, it might be possible that in a verbal test primed one or both of the identities (i.e. Asian or Female) and thus, there really are no differences between the control and experimental conditions.

In an effort to find the better understand what is going on in the control condition, we had asked 15 Asian-American women in a pre-test to generate six memories related to their gender or ethnicity, making sure to generate 3 memories associated with each identity, after they filled out the control questionnaire and were told that they would be taking a verbal test (but did not actually take the test). They were also asked to indicate the positivity of each memory on a scale of 1 (negative) to 7 (positive). We then coded for whether participants first reported an ethnicity or gender related memories, as a rough proxy for testing whether one identity may be more salient than the other. We found that participants did not seem to show a tendency to generate memories associated with one identity or another ( $t < 1$ ). This finding suggests that the second possibility, that one of the identities was activated in the control condition might be less likely.

However, we did find that participants generated significantly more positive gender-related memories ( $M = 4.09$ ) than ethnicity-related memories ( $M = 3.02$ ),  $F(1, 14) = 6.28$ ,  $p < .03$ . This pattern of results suggests that although one identity did not seem to be more salient than the other in the verbal test-taking situation, participants were affectively orienting themselves more positively towards their gender identity, the identity associated with a positive stereotype, than their ethnic identity, the identity associated with a negative stereotype. This pattern of results found for these positivity

ratings are consistent with the results reported in Pittinsky, et al., 1999, which finds that individuals orient themselves more positively towards the identity that is more adaptive in any social situation.

It is intriguing to note that while identity salience seems to be strongly related to performance outcome, affective orientation towards different identities does not seem to be strongly, if at all, related to performance. Specifically, we find that although participants in the control condition seem to be orienting themselves more positively towards their female identity in the verbal test situation, they do not seem to be performing as well as the participants in the female identity salience condition. Future studies could examine the relative strength of the relationships between affective orientation towards difference identities, identity salience and performance outcomes.

Interestingly, in the present study, identity salience did not affect participants' attitudes toward the verbal reasoning test or their assessment of their own verbal reasoning skills, yet their actual performance was affected. This pattern of findings might provide additional insights into possible mechanisms underlying stereotype performance effects. For instance, this pattern of findings is consistent with prior work finding that the influence of the salience of social identities and stereotypes often occurs below automatically, conscious awareness (e.g. an ideomotor or "cold" process as identified by Wheeler & Petty, 2001). Specifically, we found performance differences, but we did not find differences in explicit self-reported attitudes or ability. This pattern of findings suggest that although people may consciously, explicitly reject the stereotypes about their verbal ability and thus show no differences on the explicit self-report measures, they are still affected by the stereotypes in terms of their performance.

Our findings provide additional support for the proposal that it is the stereotypes associated with a social identity, and not a social identity per se, that causes performance boosts and performance declines. Previous studies varied culture and found that stereotype performance effects found in one culture were not found in a second culture where the stereotypes associated with the same identity were different (Shih et al., 1999). For example, in Vancouver, Canada, the stereotype that Asians are quantitatively talented was found to be less prevalent than in the United States. Performance boosts were not observed when the Asian identity was made salient in Vancouver, Canada (Shih et al., 1999). In contrast, the present study keeps the culture constant, and instead varies the performance domain. Consistent with previous studies, the present study finds that making the same social identity salient (e.g. Female or Asian) in different contexts (e.g. Verbal or Math test) could lead to different consequences if the stereotypes associated with the identity changes. With this in mind, it should be possible to elicit opposite performance effects on a math and verbal test in the same session by making a single social identity salient.

Furthermore, the data provide evidence for the importance of identifying the factors that call any one of an individual's multiple social identities to the forefront. Previous research finds that motivations for maintaining desirable self-perceptions can determine the identities that individuals activate and inhibit when perceiving another person (Sinclair & Kunda, 1999) and when retrieving autobiographical memories (Sanitioso, Kunda, & Fong, 1990). That work emphasizes the internal motivations that make identities salient. The present study examines how people react when the external environment makes identities salient, and finds that (a) cues in the environment, such as

questions about ethnic heritage, can influence the activation of identities, and (b) the consequences of identity activation are largely contingent on the domain.

Finally, an important implication of our findings suggest that research on the effect of social identities and stereotypes on performance could begin to shift its focus to the facilitative effects of stereotypes (e.g. Crocker & Major, 1989), as well as investigate further what happens in the absence of social identity cues. In these ways, researchers can better understand and address the debilitating effects of stigmatized social identities and stereotypes. For example, the present findings suggest focusing attention on stereotype content, rather than global stigma or “spoiled” social identities more generally, can provide possible insights into how individuals might buffer themselves from the negative consequences of stigmatized identities. If one views identities as globally adaptive or maladaptive, and not domain-specific, the remedies one might adopt for redressing the effects of stereotypes would be global. That is, one might try to buffer oneself from harmful consequences of negative stereotypes through strategies such as rejecting a social identity entirely. If, however, one views identities as adaptive or maladaptive in specific domains, one might try to buffer oneself by changing the specific associations members of the stigmatized group make between their social identity and stereotypes in that particular domain.

Examination of how multiple identities interact with stereotypes and immediate social context to influence performance will open avenues for understanding potential processes that may provide strategic resources for members of stigmatized groups. The examination of the dynamics of social identity and stereotypes (dynamics of multiple social identities and dynamics across performance domain) also provides a more

comprehensive understanding of the experience of being a member of a stigmatized group, an understanding that recognizes that even stigmatized identities can offer adaptiveness and strength in different contexts. In this study, we found that the salience of female identity which was associated with negative performance outcomes on math tests in past research, led to positive performance outcomes on verbal tests in this study. These insights on the self, social identity, and stereotypes greatly enrich and expand the research and theory agenda for understanding the effects of social identity and stereotypes on individual performance, an increasingly central domain in research on self and identity.

## References

- Ambady, N., Shih, M., Kim, A., & Pittinsky, T. L. (2001). Stereotype susceptibility in children: Effects of identity activation on quantitative performance. *Psychological Science*, 12(5), 385-390.
- Brewer, M.B. (1991). The social self: On being the same and different at the same time. *Personality and Social Psychology Bulletin*, 17, 475-482
- Croizet, J. & Claire, T. (1998). Extending the concept of stereotype threat to social class: The intellectual underperformance of students from low socioeconomic backgrounds. *Personality and Social Psychology Bulletin*, 24, 588-594.
- Crocker, J. & Major, B. (1989). Social stigma and self-esteem: The self-protective properties of stigma. *Psychological Review*, 96, 608-630.
- Dijksterhuis, A. & Bargh, J. A. (2001). The perception-behavior expressway: Automatic effects of social perception on social behavior. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 33, pp. 1-40). San Diego: Academic Press.
- Goffman, E. (1963). *Stigma: Notes on the management of spoiled identity*. New York: Simon & Schuster.
- Kray, L. J., Thompson, L., & Galinsky, A. (2001). Battle of the sexes: Gender stereotype confirmation and reactance in negotiations. *Journal of Personality and Social Psychology*, 80(6), 942-958.
- Levy, B. (1996). Improving memory in old age through implicit self-stereotyping. *Journal of Personality and Social Psychology*, 71, 1092-1107.

Pittinsky, T.L., Shih, M., & Ambady, N. (1999). Identity Adaptiveness and Affect Across One's Multiple Identities. *Journal of Social Issues: Special Issue: Prejudice and Intergroup Relations: Papers in Honor of Allport's Centennial*, 55(3), 503-518

Quinn, D. M., & Spencer, S. J. (2001). The interference of stereotype threat on women's generation of mathematical problem solving strategies. *Journal of Social Issues*, 57, 55-71.

Sanitioso, R., Kunda, Z., & Fong, G.T. (1990). Motivated recall of autobiographical memories. *Journal of Personality and Social Psychology*, 59, 229-241.

Shih, M., Ambady, N., Richeson, J. A., Fujita, K., & Gray, H. (2002). Stereotype performance boosts: The impact of self-relevance and the manner of stereotype activation. *Journal of Personality and Social Psychology*, 83, 638-647.

Shih, M., Pittinsky, T. L., & Ambady, N. (1999). Stereotype susceptibility: Identity salience and shifts in quantitative performance. *Psychological Science*, 10(1), 81-84.

Sinclair, L., & Kunda, Z. (1999). Reactions to a black professional: Motivated inhibition and activation of conflicting stereotypes. *Journal of Personality and Social Psychology*, 77, 885-904.

Spencer, S. J., Steele, C. M., & Quinn, D. M. (1999). Stereotype threat and women's math performance. *Journal of Experimental Social Psychology*, 35, 4-28.

Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and Performance. *American Psychologist*, 52, 613-629.

Steele, C. M. & Aronson, J. (1995). Stereotype threat and the intellectual test

performance of African-Americans. *Journal of Personality and Social Psychology*, 69, 797-811.

Stone, J., Lynch, C. I., Sjomeling, M., & Darley, I. M. (1999). Stereotype threat effects on Black and White athletic performance. *Journal of Personality and Social Psychology*, 77, 1213-1227.

Walton, G. & Cohen, G. L. (2003). Stereotype lift. *Journal of Experimental Social Psychology*, 39, 456-467.

Wheeler, C. S. & Petty, R. E. (2001). The effects of stereotype activation on behavior: A review of possible mechanisms. *Psychological Bulletin*, 127, 797-826.

AUTHOR NOTES

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## FOOTNOTES

1. This was the same manipulation used in Shih et al. (1999) as well as in Shih et al. (2002). It is possible that personal preferences could also be made salient in addition to their gender, causing the boost in performance with this manipulation. However, if we consider that the same manipulation led to decreased performance in Shih et al.'s (1999) study when participants were taking a math test, it seems that gender has been made salient and may be more influential.
2. The test consisted of two parts. The first part of the test, which participants were given 15 minutes to complete, consisted of 15 reading comprehension questions. A second test was administered in the same trial in which participants were tested under conditions of extreme stress: participants were given 3 minutes to complete 6 antonyms and 10 sentence completions. We report only the results of the first part of the exam because we had problems with the procedures in the second part of the exam. During the debriefing, many participants reported that when learned they had only 3 minutes to complete the second part, many of them panicked and just began to guess randomly. When we examined the means of the second part of the exam, there was no differences across conditions ( $F < 1$ , Asian  $M = 4.97$ , Control  $M = 5.03$ , Female  $M = 5.03$ ). Thus, the scores of the second part of the verbal exam were not included in the analyses.