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## STEREOTYPE SUPPRESSION AND RECOGNITION MEMORY FOR STEREOTYPICAL AND NONSTEREOTYPICAL INFORMATION

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In attempting to inhibit their stereotypes, suppressors may direct greater attention toward the very behaviors whose influence they seek to avoid. In an empirical demonstration of this effect, some participants were instructed to suppress their use of stereotypes while forming impressions of an Asian woman who revealed stereotypical and nonstereotypical behaviors. Unlike a control group who merely formed impressions, these suppressors later recognized stereotypical behaviors significantly more accurately than nonstereotypical behaviors. Because memory was assessed with a recognition measure, these findings minimize the possibility that the results were due to differential reliance on stereotype-based retrieval cues by suppressors and non-suppressors. These findings have important implications for people's ability to successfully avoid stereotyping others.

People's ability to inhibit stereotypical thinking has received increasing empirical attention in recent years. The question of whether and how people can avoid stereotyping is important because averting the use of stereotypes yields several desirable consequences. First, for those whose personal belief systems prohibit them from using stereotypes, avoiding stereotype use diminishes feelings of compunction (Monteith, 1993; Monteith, Devine, & Zuwerink, 1993). Second, suppression helps ensure that social norms against stereotyping are not transgressed (Schuman,

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Steeh, & Bobo, 1985). Third, successful suppression might be crucial to avoiding legal sanctions for using stereotypes in work and educational settings. However, recent research has shown that successful stereotype suppression can be elusive. Attempts to avoid thinking about a stereotype, in fact, tend to result in the *increased* accessibility of stereotype-related thoughts in memory. Although initial attempts to minimize stereotypic thoughts may be successful, judgments and behaviors tend to be more stereotypical after suppression attempts end than if stereotype suppression was never attempted in the first place (Macrae, Bodenhausen, Milne, & Jetten, 1994; Sherman, Wyer, & Stroessner, 1996).

The increased influence of the to-be-suppressed thoughts after suppression attempts end appears to emerge because of the processes that are initiated when individuals try to avoid particular thoughts (Wegner, 1994; Wegner, Schneider, Carter, & White, 1987). According to Wegner and Erber's "ironic process model" (1992; Wegner, 1994) two processes are instigated when individuals attempt to suppress a thought. One process, which is believed to be relatively automatic, is a monitoring process that serves to detect any occurrence of the to-be-suppressed thought. This process is necessary because to suppress an unwanted thought, the presence of that thought must first be detected in consciousness. One unintended effect of this monitoring process is that it increases the accessibility of the unwanted thought. This occurs for two reasons. First, the mere act of searching for a match between the to-be-suppressed thought and ongoing mental activity depends on the accessibility of that thought. If the thought were not accessible, identifying whether it had arisen would be problematic. Second, if the monitoring process actually detects any of the to-be-suppressed thoughts, attention is drawn to those thoughts, increasing their activation. Thus, both searching for and finding the to-be-suppressed thought in memory can lead to greater accessibility of that thought in memory (Macrae et al., 1994).

Following detection of an unwanted thought, the second process is initiated. This second process, termed the operating process, is believed to be relatively controlled. The operating process serves to replace the unwanted thought, once it is detected, with other thoughts that are more consistent with the desired state of mind. Because the operating process is relatively controlled, variables that reduce the motivation or capacity to engage in thought suppression can presumably undermine it. If the operating process either is not initiated or is interfered with, then the unwanted thought cannot be replaced. As a result, the increased accessibility that results from the automatic monitoring process may lead to a particularly heightened activation of the unwanted thought in these conditions.

### STEREOTYPE SUPPRESSION AND ENCODING OF STEREOTYPE-RELEVANT MATERIAL

These thought suppression processes illustrate why attempts at stereotype inhibition may not always meet with success. Attempts to suppress a stereotype may only increase how much attention is directed toward stereotypical thoughts and may increase the subsequent accessibility of the stereotype. However, stereotype suppression might be expected to have other important influences on social perception as well. Just as the monitoring and operating processes increase how much attention is directed at stereotypical thoughts, they might also be expected to increase the attention directed at stereotypical information in the external stimulus environment. First, the greater accessibility of the stereotype among suppressors may enhance the detectability of stereotype-consistent behaviors. That is, the accessibility of the stereotype may increase the likelihood that stereotype-consistent behaviors are noticed and encoded as stereotypical (see Hamilton & Sherman, 1994). Second, once a stereotype-consistent behavior has been encoded, attempts to inhibit stereotypic thoughts may lead to continuing activation of that behavior for the reasons discussed earlier. Therefore, one might expect stereotype suppressors to direct greater attention toward stereotype-consistent behaviors than perceivers who are not attempting to suppress their stereotypes. Of course, the allocation of greater resources toward stereotypical information leaves fewer resources that may be directed at nonstereotypical information. The implications are that suppressors might encode and store stereotypical information more thoroughly than nonsuppressors, whereas nonsuppressors might encode and store nonstereotypical information more thoroughly than suppressors.

Macrae, Bodenhausen, Milne, and Wheeler (1996, Experiment 2) recently sought to test these hypotheses by assessing participants' ability to recall stereotypical and nonstereotypical information under suppression and non-suppression instructions. Participants were instructed to form an impression of an elderly man who they saw describe himself in a short video segment. Some information contained in the man's description was stereotypical of elderly men, and some information was neutral regarding the stereotype. Before being shown the video, half the participants were told to avoid using stereotypes when forming their impression, and half were not given this instruction. One week later, participants were asked to recall as much of the information from the man's description as they could. Results showed that recall of the stereotypical information was greater for those participants who were instructed to avoid using their stereotypes than for those who were not told to avoid stereotyping. Furthermore, recall of the nonstereotypical

information was lower for the participants in the suppression than in the no suppression condition. These data are consistent with the notion that engaging in stereotype suppression increases the likelihood that available stereotypical information will be noticed and stored in memory, and that suppression decreases the likelihood that nonstereotypical information will be attended to and thoroughly encoded.

### ENCODING VERSUS RETRIEVAL

Because free recall was used as the measure of memory in Macrae et al.'s (1996) study, however, these intriguing findings are open to an alternate interpretation. Free recall is not a clear indicator of how much attention has been given to stereotype-relevant information or how well that information has been represented in memory. Free recall performance reflects not only attention, encoding, and storage, but also retrieval. Therefore, the greater recall of stereotypical material displayed by suppressors over nonsuppressors may not reflect greater attention to that information or enhanced representation of that information by these participants, but may rather reflect the greater ease with which these participants can retrieve the stereotypical information from memory.

One of the most important determinants of the retrievability of an item from memory is the nature and strength of the cues used to retrieve the information (e.g., Tulving & Pearlstone, 1966). Previous work has shown that stereotypes provide useful retrieval cues that promote access to stereotype-consistent information (e.g., Dijksterhuis & van Knippenberg, 1996; Rothbart, Sriram, & Davis-Stitt, 1996; van Knippenberg & Dijksterhuis, 1996). Such cues are particularly effective in prompting recall of an item if the cue was associated with the item during encoding (Tulving & Pearlstone, 1966). Given the differential accessibility of the stereotype for suppressors and nonsuppressors during encoding, an account based purely on the differential use of the stereotype as a retrieval cue could potentially account for Macrae et al.'s (1996) data. If instructions to suppress the stereotype increased the activation of the stereotype during encoding (as has been demonstrated in other studies), then the stereotype would have been more likely to have become associated with the behavioral information encountered. This would have been especially likely for the stereotypic information because the suppressors' monitoring process would have detected those items as matches with the unwanted stereotype. Thus, the enhanced recall of stereotypical information (and, conversely, the poorer recall of nonstereotypical information) by participants in the suppression condition might merely have resulted from the differential use of the stereotype as a retrieval cue, and not because the stereotypical information was better

represented in memory. The fact that recall was collected seven days after encoding also contributes to this possibility, given that expectancy-based retrieval cues become increasingly effective as information decays in memory (Stangor & McMillan, 1992).

One way to control for the differential use of the stereotype as a retrieval cue by suppressors and nonsuppressors is to test participants' memory with a recognition task. Recognition tests minimize the role of retrieval processes in two ways. First, participants are not required to generate any of the material on their own. Instead, old items are re-presented along with foil items that have not yet been seen but are similar to the old items. Participants then must decide which of the items they had previously seen and which they had not. Because the test items are presented to the participants, recognition tests are minimally influenced by retrieval cues. Second, recognition tests allow computation of a recognition measure that controls for response biases. This measure mathematically removes the effects of guessing strategies and response biases that might otherwise influence the free recall performance of suppressors and nonsuppressors. For example, because the stereotype is more accessible for suppressors, they might set a lower reporting criterion for stereotypical behaviors they are not sure they have seen. Because recognition measures control for these various retrieval processes, they provide a much more sensitive measure than free recall as to whether or not a given piece of information has been stored in memory (e.g., Stangor & McMillan, 1992).

### THE PRESENT EXPERIMENT

The primary goal of this experiment was to assess the impact of stereotype suppression on memory for stereotypic and nonstereotypic information using a recognition measure. Our prediction was that stereotype suppressors would more thoroughly encode a target's stereotypical behaviors and less thoroughly encode a target's nonstereotypical behaviors than would nonsuppressors. This would result in better recognition accuracy for stereotypical behaviors among suppressors and better accuracy for nonstereotypical behaviors among nonsuppressors. In addition, whereas suppressors should show better recognition for stereotypical than nonstereotypical information, nonsuppressors should recognize both kinds of information equally well.

A secondary goal of this experiment was to test whether the same effects reported by Macrae et al. (1996) would emerge if socially sensitive stereotypes were being suppressed. In Macrae et al.'s (1996) study, the target was an elderly man selected to ensure that participants would not be highly motivated to avoid stereotyping the target in the absence of

explicit suppression instructions. In our experiment, we used a target from a social group that is much more likely to initiate spontaneous suppression concerns among participants (Judd, Park, Ryan, Brauer, & Krause, 1995; Schuman, Steeh, & Bobo, 1985). Specifically, our target was an Asian female college student. The choice of this target allowed us to examine the extent to which the effects reported by Macrae et al. generalize to members of more socially sensitive groups.

## METHOD

### PARTICIPANTS AND DESIGN

A total of 27 non-Asian undergraduates from the University of California, Santa Barbara participated in the experiment in exchange for partial course credit.<sup>1</sup> Participants listened to an audiotape of an Asian female target describing her activities during a typical day. The description contained 10 items reflecting traits typically perceived as stereotypical of Asian-American females and 10 items that were nonstereotypical (i.e., irrelevant to the stereotype). Half the participants were told simply to form an impression of the target. The other half of the participants were additionally instructed to avoid using any stereotypes when they formed their impression. Thus, the experiment utilized a 2 (no suppression vs. suppression instructions)  $\times$  2 (stereotypical vs. nonstereotypical items) design with repeated measures on the second factor.

### PROCEDURE

Participants were welcomed by the experimenter and were told that they would participate in a study assessing how people form first impressions of others. They were told that they would listen to an audiotape of a student from another university describing the events during her typical day. All of the participants were instructed that they should form an impression of what they thought the student was like. The participants who had been randomly assigned to the suppression instruction condition were additionally told that "preconceptions or stereotypes often influence the impressions people form of others." These participants were asked to "try not to use any stereotypes as you form your impression."

The participants then listened to the audiotape recording. On the recording, an Asian female ostensibly named Candace Chang described

1. Data from only non-Asian students were collected because it seemed likely that Asian students would respond differently to the experimental stimuli.

her activities during a typical day. The target described 10 behaviors that were consistent with the stereotype of Asian-Americans and 10 behaviors that were nonstereotypical. The stereotype-consistent behaviors reflected high degrees of studiousness, intelligence, industriousness, shyness, reservedness, submissiveness, and closeness to family (e.g., "studies before breakfast," "does everything her boss tells her to do even when she doesn't think it is her responsibility," see Rothbart & John, 1993 for a description of Asian-American stereotypes). The nonstereotypic behaviors primarily reflected facts about Candace's day (e.g., "makes dinner at home"). The audiotape recording lasted approximately two minutes.

After listening to the audiotape, participants completed a filler task for five minutes. The filler task, during which participants labeled a variety of geographic features on a map, was used to clear short-term memory. Participants were then given 10 practice trials on experiment-unrelated questions to familiarize themselves with using the "yes" and "no" keys on their computers.

After completing the practice trials, participants were told that they would be presented with some statements that referred to the student they had heard on the audiotape. Whereas some items reflected information that the target mentioned, participants were told that other items were not part of the target's description of her day. Forty items then appeared on the computer screen in random order. Twenty of the items were consistent with the stereotype of Asian-American females. Of those items, half had been part of the target's description of her day (i.e., "old" items) and half were foils that were not part of her description (i.e., "new" items). The other twenty items were nonstereotypical. Half those items had appeared in the description, and the others had not. After each statement appeared on the screen, participants pressed the "yes" key if they recognized the item from the target's description and pressed the "no" key if they believed that the item had not been part of the target's description. After completing the procedure, participants were fully debriefed and thanked for their participation.

## RESULTS

The proportion of hits (correct identification of old items) and false alarms (failure to reject new items) were used to compute separate measures of recognition accuracy for stereotypic and nonstereotypic items for each participant. A nonparametric measure of recognition sensitivity,

$$A' = \frac{1.5 + (\text{hits} - \text{false alarms})(1 + \text{hits} - \text{false alarms})}{[4((\text{hits} - 1) - \text{false alarms})]}$$

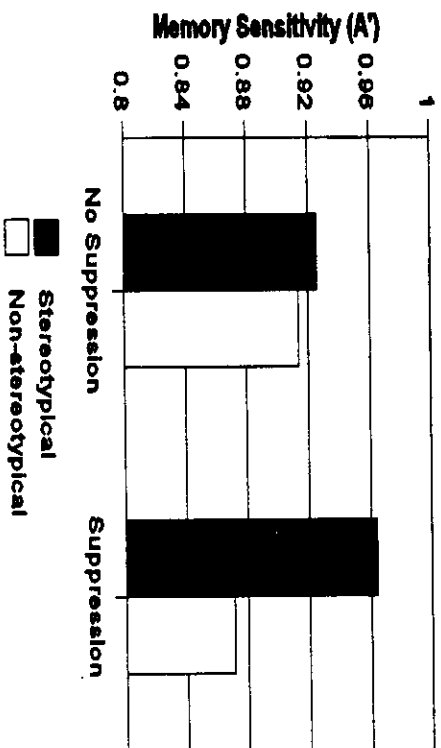


FIGURE 1. Memory sensitivity for stereotypical and nonstereotypical information as a function of stereotype suppression.

(Grier, 1971), was chosen because some participants exhibited perfect memory discrimination. Specifically, whereas no participants exhibited perfect memory for nonstereotypical information, eight participants had perfect memory for stereotypical information. Like other sensitivity measures,  $A'$  reflects the degree to which each participant correctly discriminated correct old items from new foil items while controlling for guessing strategies and response biases.

Participants'  $A'$  measures for stereotypic and nonstereotypic items were submitted to a 2 (no suppression vs. suppression instructions)  $\times$  2 (stereotypical vs. nonstereotypical item) ANOVA with repeated measure on the second factor. This analysis yielded an Item Stereotypicality main effect,  $F(1, 25) = 22.65, p < .001$ , and the predicted Instruction  $\times$  Item Stereotypicality interaction,  $F(1, 25) = 13.52, p < .01$ . The Item Stereotypicality main effect indicates that discrimination was greater for stereotypical ( $M = .95$ ) than for nonstereotypical ( $M = .89$ ) items. As can be seen in Figure 1, however, the interaction indicates that this difference did not emerge in both suppression conditions. For participants who did not suppress their stereotypes, there was no difference in their recognition of nonstereotypical and stereotypical items,  $t < 1$ . In contrast, and as predicted, participants who suppressed their stereotype exhibited greater discrimination for stereotypical than for nonstereotypical information,  $t(25) = 5.85, p < .001$ . Furthermore, comparisons between the two suppression conditions indicated that participants who suppressed their stereotypes exhibited marginally

more discrimination for stereotypical items,  $t(25) = 1.65, p < .10$ , and less discrimination for nonstereotypic items,  $t(25) = 1.91, p < .05$ , than did participants who did not suppress (one-tailed tests).

## DISCUSSION

The results of this experiment replicate and extend the findings of Macrae et al. (1996). Participants who attempted to suppress their stereotypes demonstrated greater memory for stereotypical than nonstereotypical information. By contrast, nonsuppressors recognized stereotypical and nonstereotypical information equally well. In addition, whereas suppressors recognized stereotypical information more accurately than nonsuppressors, nonsuppressors recognized nonstereotypical information more accurately than suppressors. We demonstrated these findings despite using a target person from a socially sensitive group that might be likely to initiate spontaneous attempts at stereotype suppression in the absence of explicit instructions to do so. In addition, by measuring memory with a recognition task, we minimized the possibility that these results were due to the differential effectiveness of the stereotype as a retrieval cue for suppressors and nonsuppressors. Instead, our results suggest that there are important differences in the extent to which suppressors and nonsuppressors encode and store stereotypical and nonstereotypical information about a target person.

These results highlight some unintended consequences and costs of stereotype suppression. First, it appears that attempts at stereotype suppression not only increase the accessibility of the stereotype in perceivers' minds, as has been demonstrated in other research (e.g., Macrae et al., 1994; Sherman et al., 1996), but that suppression also increases the encoding of the stereotypical behaviors of others as well as memory for them. Ironically, it is the implications of these very behaviors that suppressors are trying to minimize as they form their impressions of the target. Moreover, to the extent that attention is differentially directed toward stereotypical information during suppression, then fewer resources are available to allocate toward nonstereotypical information that might facilitate the formation of an individuated impression of the target. Because suppressors direct so much of their attention toward stereotypical behaviors, they cannot thoroughly encode the nonstereotypical information and therefore recognize it with less accuracy.

The greater availability of stereotypical information also may have serious implications for the judgments that suppressors make about the targets of their suppression attempts. Our results indicate that the knowledge base on which suppressors may base their judgments likely will include more stereotypical than nonstereotypical information

about the target, and Macrae et al.'s (1996) data suggest that stereotypical information is more likely to be spontaneously recalled. Both lines of evidence agree that stereotype suppression leads to an increase in the availability of stereotypical information, making it likely that stereotypical information will influence judgments. This would be especially likely to the extent that perceivers are unable to form impressions of targets "on-line" as they are learning about them, and must instead base their subsequent judgments on the "raw data" from memory. In these circumstances, suppressors' efforts may be particularly likely to backfire, leading to more stereotypical judgments than those made by nonsuppressors. These effects may be particularly evident in situations in which the original goal of stereotype suppression is no longer salient (e.g., after some passage of time). In these cases, suppressors would be less likely to correct their judgments away from the implications of the material stored in memory. Thus, the encoding effects demonstrated in this experiment may seriously undermine the intentions of stereotype suppressors.

However, the results of this experiment do not minimize the benefits gained through stereotype inhibition concerning personal satisfaction and improved social relations. Moreover, it may be the case that there are important individual differences in the extent to which suppressors are subject to these unintended costs. On the one hand, it may be that low prejudiced people do not have these difficulties in inhibiting unwanted stereotypes. Because they have made concerted attempts over a long period of time to inhibit stereotypes (e.g., Monteith, 1993), and because they have made accessible egalitarian personal beliefs that can replace the unwanted stereotypes (e.g., Devine, 1989), these individuals may be able to inhibit with very little cost. Both practice (e.g., Kelly & Kahn, 1994) and the availability of replacement thoughts (Wegner et al., 1987) are two important factors shown to moderate the unintended results of thought suppression. On the other hand, individuals who are highly motivated to suppress their stereotypes but do not have the necessary practice and replacement thoughts may be particularly susceptible to the sorts of processes outlined in this paper. It is clear that future research on this topic must begin to address the more complex questions about how these basic processes are influenced by different situational contexts and how they vary across different individuals.

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#### ERRATUM

An error appears in J. W. Sherman, S. J. Stroessner, S. T. Loftus, and G. DeGuzman's "Stereotype Suppression and Recognition Memory for Stereotypical and Nonstereotypical Information" published in *Social Cognition* 15(3), Fall 1997, pp. 205-216.

On p. 211, under the section RESULTS, paragraph 1, the equation for A' is incorrectly given as:

$$A' = \frac{.5 + (\text{hits} - \text{false alarms})(1 + \text{hits} - \text{false alarms})}{[(4((\text{hits}(1 - \text{false alarms})))]}$$

The text should read:

$$A' = .5 + \frac{[(\text{hits} - \text{false alarms})(1 + \text{hits} - \text{false alarms})}{(4 \text{ hits}(1 - \text{false alarms}))]}$$

We apologize for the inconvenience.