

# Stereotype Threat Deconstructed

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## Abstract

More than a decade of research has demonstrated that individuals underperform in situations that remind them that they are stereotyped to do poorly. This paper explores the psychological processes that underlie these stereotype threat effects. Specifically, reminders of negative stereotypes cue uncertainty and a search for evidence that one might be confirming the stereotype. This process of monitoring for failure and suppressing negative thoughts and feelings hijacks the very cognitive mechanism—working memory—that is necessary for success on complex cognitive tasks where group differences in performance are a concern. Fortunately evidence suggests that when stigmatized individuals reappraise their experience, group differences in performance can be reduced if not eliminated.

## Keywords

stereotype threat, stigma, academic performance, working memory, reappraisal

One of the most vexing problems in the struggle for equality is the fact that the dismantling of institutionalized barriers to advancement has not erased gender and racial gaps in achievement. If these groups are now free to excel, why do they continue to underperform? Steele and Aronson (1995) broke important new ground in this entrenched debate when they suggested that most academic settings are replete with subtle reminders of stereotypes that presume the incompetence of certain groups. This “threat in the air” can cue a concern with confirming these stereotypes that can impair the ability to perform up to one’s potential.

In the decade after this theory of stereotype threat was first identified, it quickly became one of the most widely researched topics in social psychology. Effects have been found to extend to those stigmatized on the basis of gender, ethnicity, and socioeconomic status and in a broad range of settings including academics, athletics, the workplace, and neurological testing (Steele, Spencer, & Aronson, 2002). But it has also been demonstrated that anyone can exhibit impaired performance when reminded of ways in which they might be negatively stereotyped. Thus, women perform more poorly at math if told they will be compared to men, but White men also perform more poorly at math if told that they will be compared to Asian men (Aronson et al., 1999; Johns, Schmader, & Martens, 2005). With more than a decade of research establishing that stereotype threat impairs performance, there has been a need for understanding *how* these effects occur. The work in our lab has sought to answer this riddle by

deconstructing the series of psychological processes that underlie these pernicious effects.

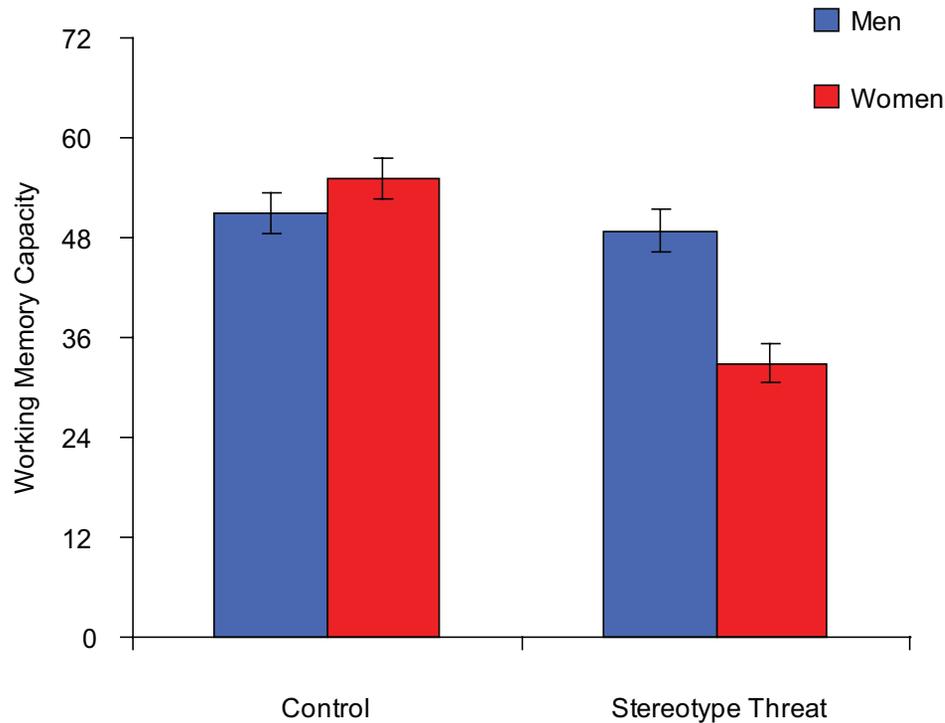
## A Threat in the Air That Weighs Heavily on the Mind

Our approach is to assume that when individuals are reminded of being the target of negative stereotypes, they expend cognitive effort at more than just the task at hand. Because the situation primes a sense of uncertainty about their ability in a domain in which they would like to excel, they become motivated to make sure that any sign that they might be confirming the stereotype is identified and suppressed. Ironically, this increased vigilance and control hijacks the same central executive processor (i.e., working memory) needed to excel on complex cognitive tasks, producing the very result—poorer performance—that they are trying to avoid. Although we present a more formal model of these processes elsewhere (Schmader, Johns, & Forbes, 2008), here we summarize some of the data we have collected to support several key hypotheses.

For example, one core hypothesis is that when individuals feel that they might be judged through the lens of a negative stereotype, they experience reduced working memory

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**Fig. 1.** Working memory capacity as a function of stereotype threat (vs. no threat), for men and women (Study 1 of Schmader & Johns, 2003).

capacity—the ability to focus attention on a goal-relevant task at hand while inhibiting task-irrelevant information (Engle, 2002). There are now several pieces of evidence to support this conclusion (e.g., Beilock, Rydell, & McConnell, 2007). For example, in one study (Schmader & Johns, 2003), men and women completed a well-validated measure of working memory capacity requiring them to solve simple equations while simultaneously remembering words for later recall (Turner & Engle, 1989). Women and men showed similar scores on this task when it was described to them as a memory measure (see Fig. 1). However, when told that this task would index gender differences in quantitative capacity, women had lower working memory capacity than their male peers. This effect replicated in a study of Latinos told that the task would reveal their intelligence, and a final study linked these cognitive deficits to women’s poorer math performance under stereotype threat. Taken together, these findings suggest that when individuals fear that they might confirm a stereotype about their group, their attention is divided between the task in front of them (e.g., taking a test) and some other psychological process. In follow-up work, we have tried to uncover just what that process is.

### ***Losing oneself in the moment***

One piece of this picture is a heightened sense of uncertainty about oneself and one’s abilities. It is ironic that the individuals most susceptible to stereotype threat are those who are most

invested in doing well in that domain (e.g., academics; Steele, 1997). Although these individuals might normally be quick to associate themselves with the domain, the threat of confirming a negative stereotype calls into question these self-perceptions. For example, in a recent study (Schmader, Whitehead, & Forbes, 2009), we had highly math-identified women and men complete a categorization task in which we asked them to decide as quickly as possible whether they could or could not envision themselves in a variety of different occupations. We were most interested in how fast they were to respond to several math-related careers (e.g., accountant, scientist), under the assumption that those who were quickest to say “yes, I could imagine myself as a statistician” have the strongest math self-concept.

Although men and women both said they could imagine themselves in about half of the math careers they saw, women seemed to become less confident in these judgments when we had them perform the categorization task again while they were waiting to take a math test that would be graded by a male graduate student. For men in this situation, those who were quick to associate themselves with math initially were still quick to make these associations while waiting to take a math test. But for women, those who were initially fastest to imagine themselves in a math-related career actually became the slowest to make these same judgments when under stereotype threat. When their math ability was about to be put to the test, these math-identified women felt uncertain about who they were and what they could do.

### **Searching for signs of failure**

At the same time that stereotype threat raises uncertainty about one's abilities, it also makes one vigilant for any evidence that one could be confirming the stereotype. Such evidence might be found in one's own behavior (Am I making mistakes?), internal experiences (Am I too anxious?), or others' reactions (Do they think I'm stupid?). For example, in one study, we measured patterns of brain waves seen in minority students as they performed a task that had been described to them as a simple pattern recognition task or as a diagnostic test of intelligence (Forbes, Schmader, & Allen, 2008). We were most interested in something called error-related negativity (ERN), which is thought to index activation of the anterior cingulate cortex, a region of the brain involved in detecting when one's behavior conflicts with goals. Because the ERN is detected in patterns of brain-wave activity only 30 to 180 milliseconds after a person makes a mistake, it is thought to reflect fast if not preconscious attention to the error. In our study, minority students who cared the most about doing well academically had higher ERN amplitudes to their errors on the task, but only when they believed we were assessing their intelligence. When their intelligence was on the line, these academically identified minority students were vigilant to signs that they might be failing.

But stereotype threat not only increases sensitivity to mistakes, it also increases sensitivity to one's own internal states. Most people assume that they feel anxious when things aren't going well, and so anxiety itself during performance can readily be interpreted as evidence of failure. To demonstrate that individuals are hypervigilant to anxiety when under stereotype threat, we had women complete a simple reaction-time task under stereotype-threatening or neutral conditions (Johns, Inzlicht, & Schmader, 2008). This task covertly indexes vigilance to anxiety and anxiety-related stimuli by measuring whether people are faster to identify the position of a dot if an anxiety word (vs. a neutral word) had just been presented in that location, thus drawing their attention to it. As expected, women under stereotype threat were more likely to have their attention drawn toward anxiety-related stimuli than were women in a neutral condition. Moreover, the more women showed this vigilance to anxiety, the lower their working memory on a subsequent task.

### **The view through threat-colored glasses**

Even if one identifies and acknowledges errors or anxiety during performance, such events could be interpreted as a normal part of learning and assessment. But stereotype threat activates negative thoughts that can bias the interpretation of what one is thinking, feeling, and doing. Anxiety during a test might be fine if one is feeling confident, but when experienced alongside thoughts of doubt, it becomes a distraction. Consider a recent study in which White and minority students came to the lab to take what they were told would be a diagnostic test of intelligence (Schmader, Forbes, Zhang, & Mendes, 2009). After

reporting their initial level of anxiety about the test, they all completed an adapted measure of working memory, which was in fact the primary variable of interest.

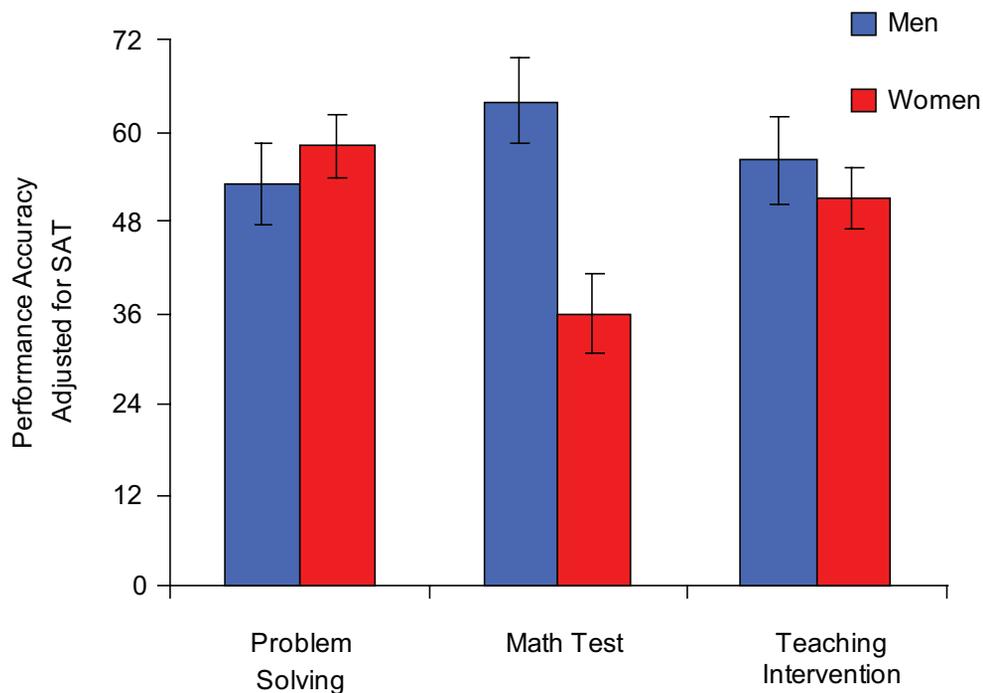
In this measure, working memory was assessed as individuals' ability to remember lists of words, given that they have to read an unrelated sentence aloud before each word is presented. We modified this measure so that some of these sentences included words associated with either confidence or doubt. As expected, anxiety about the upcoming test predicted lower working memory, but only for those who were primed with thoughts of doubt. When primed with thoughts of confidence, anxiety was unrelated to working memory. When anxiety is considered alongside more positive self-views, it ceases to have the power to interfere with other processing. Furthermore, although stereotype threat might normally cue self-doubt for minorities more than for Whites (Steele & Aronson, 1995), we were able to demonstrate that both groups of students exhibit the same deficits once the seeds of doubt have been planted by priming these thoughts directly.

### **Never let 'em see you sweat**

After the interpretation stage, individuals under threat are left with thoughts and feelings that seem bad for performance. Although these negative thoughts could manifest as ruminations that themselves absorb cognitive resources (Beilock et al., 2007), they also motivate efforts to push them out of mind. We garnered evidence of emotion regulation attempts in a second condition of the dot-probe study described earlier (Johns et al., 2008). In this additional condition, we told women that we would be able to know if they were anxious by how much their attention was drawn toward anxiety words. We reasoned that if stereotype threat motivates a desire to suppress anxiety, women would now redirect their attention away from anxiety-related words and their reaction times would reveal these efforts. This is just what we found: When presented with both a neutral and an anxiety word, women under stereotype threat redirected their attention away from the anxiety word. Those women who exerted the most effort to avoid appearing anxious also had the lowest working memory scores, suggesting that these regulation processes are indeed cognitively draining.

### **Reconstructing Success by Reappraising the Situation**

The evidence reviewed points to how stereotype threat cues a mentally taxing process of monitoring performance and regulating emotions. The good news is that this cycle can be broken when the situation, including one's own internal experience, is reappraised. For example, although women and minorities try to avoid anxiety in anticipation of a test, these suppression efforts are eliminated if they are first told that anxiety will not harm their performance (Johns et al., 2008). This instruction to reappraise anxiety restores working memory and predicts better test performance even under threat.



**Fig. 2.** Performance accuracy (controlling for preexisting differences in test scores) for men and women as a function of stereotype threat, both when students were taught about stereotype threat (teaching intervention) and when they were not taught (math test) and as compared to a no-threat condition (problem solving; Johns, Schmader, & Martens, 2005).

Although these results suggest that people can be taught to reappraise their emotions, other research shows that some people do this spontaneously. In a recent study (Schmader, Forbes, et al., 2009), we assessed women's sympathetic nervous system activation (measured by levels of alpha amylase in their saliva) just before they took a practice GRE test. Although one might expect sympathetic activation to predict poorer test performance, this was true only among women who reported on an earlier questionnaire that they did not tend to reappraise their negative emotions. Among women who generally reappraise their emotions, the higher their sympathetic activation going into the test, the better they did.

Studies such as these provide optimism that stereotype threat can be undermined fairly readily by changing one's frame of reference. But there is still the issue of how such effects could be implemented. Fortunately, the theory of stereotype threat—with its focus on situational explanations for anxiety and poor performance—provides individuals with a different interpretation of their experience. By teaching students about the theory, we might effectively inoculate them against its effects. Consider the results of a study in which male and female statistics students completed a set of math problems described to them in one of three ways (Johns et al., 2005). One third was told that this was a simple laboratory exercise, and with this neutral frame, women performed just as well as their

male peers (see Fig. 2). A second third was told that this was a diagnostic math test used to compare men's and women's math ability. Not surprisingly, women in this condition underperformed their male counterparts. The final third received this same information but were also taught about stereotype threat and how it could make women anxious during tests. Although women in this condition still thought the researchers expected them to do poorly, their performance was just as good as men's. Knowledge really does grant the power to eliminate threat.

In the global economy of the 21st century, there is greater acknowledgement that we cannot afford to ignore factors that reduce human capital. Individuals live, work, and learn in increasingly diverse environments—environments that might be laden with subtle reminders of societal stereotypes. As we have reviewed, the mere knowledge of stereotypes that impugn your group's abilities can set in motion psychological processes aimed at disproving these beliefs. Ironically, those processes themselves divert resources from effective performance and can exacerbate the appearance of group differences in ability. Fortunately, these differences can be reduced if not erased by changing the nature of these performance environments to encourage more positive views of one's group or one's own abilities, or through greater transparency of the pernicious effects that stereotyping can have. By deconstructing stereotype threat, we can diffuse the damage it can do.

## Recommended Reading

- Schmader, T., Johns, M., & Forbes, C.E. (2008). (See References). A more thorough analysis of the processes by which threat reduces performance.
- Steele, C.M. (1997). (See References). A user-friendly description of the original theory.
- Steele, C.M., & Aronson, J. (1995). (See References). A historical classic, among the first set of studies demonstrating stereotype threat.

## Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the authorship and/or publication of this article.

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