



## Reports

## Threatened to distraction: Mind-wandering as a consequence of stereotype threat

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## ABSTRACT

Two experiments tested the hypothesis that the threat of a negative stereotype increases the frequency of mind-wandering (i.e., task-unrelated thought), thereby leading to performance impairments. Study 1 demonstrated that participants anticipating a stereotype-laden test mind-wandered more during the Sustained Attention to Response Task. Study 2 assessed mind-wandering directly using thought sampling procedures during a demanding math test. Results revealed that individuals experiencing stereotype threat experienced more off-task thoughts, which accounted for their poorer test performance compared to a control condition. These studies highlight the important role that social forces can have on mind-wandering. More specifically, these results serve as evidence for task-unrelated thought as a novel mechanism for stereotype threat-induced performance impairments.

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We have all had the experience of sitting down to a task – writing a paper, reading a book, listening to a lecture – only to realize, perhaps with some frustration, that our mind has drifted away. The recent interest in mind-wandering calls attention to the simple fact that we are not always masters of our mind. Although mind-wandering may provide a welcomed respite from the minutia of everyday life, it can also impair performance (e.g., Smallwood, McSpadden, & Schooler, 2008). So imagine the implications if the tendency to mind-wander is systematically increased for certain segments of the population when confronting a task that could singularly determine their access to the best schools, funding opportunities, and career prospects. The current research integrates the methods for assessing mind-wandering with the theoretical framework for how negative stereotypes can systematically undermine performance in a way that could contribute to educational and economic disparities based on gender, ethnicity, race, and social class. The aim was to test the hypothesis that individuals are more likely to mind-wander in situations where they are stereotyped to do poorly and as a result are prevented from performing to their full potential.

## How stereotype threat affects attention and thought

Stereotype threat, defined as the risk of behaving in a way that substantiates a negative stereotype against one's group (Steele & Aronson, 1995), has emerged as a phenomenon of great theoretical

and practical interest. Recent advances have revealed an integrated set of mechanisms that are responsible for these impairments (Schmader, Johns, & Forbes, 2008). These include an increased physiological stress response, more conscious monitoring of performance, and active regulation of negative thoughts and feelings, each of which might work alone or in concert to hijack the working memory resources needed for complex cognitive problem solving. In an alternative account, Jamieson and Harkins (2007) propose that performance is impaired because the threat of confirming the stereotype prompts greater effort on the task which serves to potentiate one's dominant response. When this automatically activated response is not the most effective or efficient route to good performance, the likelihood of success is diminished.

Although these accounts differ in their explanation of how stereotypes impair performance, they both assume that people are trying to maintain attention on the task. The Jamieson and Harkins' mere effort account would seem to predict that attention would be hyper-focused on the task as people put forth additional effort in an attempt to disconfirm the stereotype. Schmader et al.'s integrated process model would suggest that if attention strays from the task, it is because people become absorbed in meta-cognitions about their performance (Schmader, Forbes, Zhang, & Mendes, 2009). Indeed, there is evidence that this does occur. Cadinu, Maass, Rosabianca, and Kiesner (2005) found that performance deficits resulting from stereotype threat were mediated by an increase in negative task-related thoughts during prior test sections. Similarly, Beilock, Rydell, and McConnell (2007) found that stereotype threat results in a greater proportion of task-related thoughts and worries.

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Although on-task thoughts and worries increase when people are the targets of negative stereotypes, prior research has not found an equivalent increase in task-unrelated thoughts (Beilock et al., 2007). However, methodological limitations may have prevented previous studies from uncovering the role of mind-wandering in disrupting task performance under stereotype threat. For instance, Cadinu et al. (2005) examined the role of negative thinking under stereotype threat but did not include task-unrelated thoughts in the verbal report coding scheme, eliminating any possibility of establishing the extent to which individuals were mind-wandering. Beilock et al. (2007) did include mind-wandering in their coding scheme, but relied on participants reporting their thoughts and feelings *after* the testing session. Research on mind wandering suggests that although retrospective measures allow for a rich assessment of the content of thought, they may systematically overlook many mind-wandering episodes. One reason for this discrepancy is that thoughts frequently drift away from a task without our awareness that our mind has gone AWOL (Schooler, 2002; Schooler, Reichle, & Halpern, 2005; Smallwood et al., 2008). This important fact may underlie the difficulty prior work has encountered in demonstrating the role of task-unrelated thought in stereotype threat or in documenting evidence of increased anxiety using self-report measures (Bosson, Haymovitz, & Pinel, 2004; Johns, Inzlicht, & Schmader, 2008). Thoughts and feelings that one is unaware of are especially pernicious in affecting behavior because one cannot compensate for them (Schooler et al., 2005; Smallwood et al., 2008). Perhaps this is why task performance can be impaired more by thoughts that are completely unrelated to the task than by task-related interference and worries (Smallwood, Baracaia, Lowe, & Obonsawin, 2003). In fact, a great deal of research suggests that mind-wandering can have a strong negative impact on task performance (Smallwood & Schooler, 2006). We review some of this work below in consideration of the role that mind-wandering may play in stereotype threat induced performance deficits.

### Mind-wandering under stereotype threat

Mind-wandering is defined as a decoupling of attention from the immediate task context toward unrelated concerns (Smallwood & Schooler, 2006). Previous research has indicated that mind-wandering can have detrimental effects on performance in several domains (e.g., Smallwood et al., 2008; Cheyne, Solman, Carriere, & Smilek, 2009), and may play an important role in educational settings (Smallwood, Fishman, & Schooler, 2007). Moreover, just as situations of stereotype threat are most likely to impair performance on cognitive tasks that require a degree of controlled processing (Schmader et al., 2008), mind-wandering is also most disruptive to task performance when sustained attention is needed to be successful (Smallwood & Schooler, 2006).

Although mind-wandering happens to us all from time to time, the tendency toward mind-wandering can also be affected by the situation. Mind-wandering is more likely to occur on tasks that we can carry out automatically (e.g. driving, running, and to some extent, reading). We know less about how social context can facilitate or impede mind-wandering, and the current set of studies begins to address that gap. We hypothesized that the threat of being targeted or judged by a negative stereotype would promote mind-wandering, which in turn may contribute to the performance detriments associated with stereotype threat. There are several reasons for this hypothesis.

First, according to Schmader et al.'s integrated process model of stereotype threat, individuals experience impairments to working memory capacity when they are targeted by a negative stereotype (Beilock et al., 2007; Schmader & Johns, 2003). In other research, those who are low in working memory capacity show an increased likelihood of mind-wandering (McVay & Kane, 2009). Therefore, if stereotype threat generally impairs the central executive resource

that allows us to focus attention on some focal task, then mind-wandering during that task should increase.

However, it is also possible that mind-wandering itself is triggered by stereotype threat and once initiated engages the same resources that are needed for successful task performance (Smallwood, 2010). For example, Christoff, Gordon, Smallwood, Smith, and Schooler (2009) show that during mind-wandering, individuals exhibit increased activation of both the default network that is typically activated during rest and areas like the anterior cingulate cortex and the dorsolateral prefrontal cortex that underlie central executive functions like working memory. Christoff et al. (2009) speculate that the increased activation of the ACC might suggest detection of cognitive inconsistencies that then require executive resources to understand or resolve. Smallwood and Schooler (2006) argue that the activation of executive processing areas points to the idea that mind-wandering itself can be a resource demanding activity leading to performance impairments.

Furthermore, individuals under threat also end up feeling anxious, especially if they attribute their arousal internally (Johns et al., 2008). Increased mind-wandering under stereotype threat could therefore result from increased anxiety (there is an established link between mind-wandering and negative moods, Smallwood, O'Connor, Sudbery, & Obonsawin, 2007; Smallwood, Fitzgerald, Miles, & Phillips, 2009). Specifically, the increase in mind-wandering under threat may be indicative of people using their "affect as information" (Schwarz & Clore, 1983) and employing cognitive efforts to make sense of their current internal state even though this can draw attention away from the task altogether. This might explain why research finds that attributing one's arousal to an external cause can attenuate the stereotype threat effect (Ben-Zeev, Fein, & Inzlicht, 2005; Johns, Schmader, & Martens, 2005).

From these multiple viewpoints, we predict that situations of stereotype threat should increase the prevalence of mind-wandering, which may contribute to the ensuing performance detriments. The challenge, however, is that individuals are often unaware that mind-wandering has occurred. Thus, although participants may be mind-wandering repeatedly during testing, they may not be able to report this using retrospective thought listing.

### Experimental overview

To test these hypotheses, two experiments were conducted employing methodological advances developed to measure mind-wandering. Study 1 tested the effect of stereotype threat on indirect performance markers of mind-wandering during the Sustained Attention to Response Task (SART; Robertson, Manly, Andrade, Baddeley, & Yiend, 1997). Study 2 was designed to build on the first study by using thought sampling to directly measure task-unrelated mind-wandering *during* a demanding math test. These studies provided the opportunity to examine whether more sensitive measures of the occurrence of task-unrelated thought would provide support for the hypothesis that mind-wandering is partially accountable for the detrimental effects of stereotype threat.

### Study 1

#### Participants

43 female undergraduate students from the University of California Santa Barbara participated in exchange for course credit (mean age = 19.0, *SD* = 1.85).

#### Procedure

Study 1 was a between subjects design comparing the frequency of mind-wandering among women under stereotype threat to women in a control condition. Stereotype threat was induced by adapting a

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