Brief report

‘Be prepared’: An implemental mindset for alleviating social-identity threat

Tara C. Dennehy1*, Avi Ben-Zeev2 and Noriko Tanigawa3
1Department of Psychology, University of Massachusetts, Amherst, USA
2Department of Psychology, San Francisco State University, San Francisco, USA
3Department of Linguistics, Philology, & Phonetics, Oxford University, UK

Stereotype threat occurs when people who belong to socially devalued groups experience a fear of negative evaluation, which interferes with the goal of staying task focused. The current study was designed to examine whether priming socially devalued individuals with an implemental (vs. a deliberative) mindset, characterized by forming a priori goal-directed plans, would help these individuals to overcome threat-induced distracting states. Participants from low and high socioeconomic status backgrounds (measured by maternal education; SESm) completed a speeded mental arithmetic test, an intellectually threatening task. Low-SESm individuals performed comparably and exhibited similar confidence levels to high-SESm counterparts only when induced with an implemental mindset, suggesting that implemental mindset priming may help to create equity in the face of stereotype threat.

To be ‘quick on the uptake’, ‘think on one’s feet’, and a ‘quick study’ are cultural idioms that speak to the perception of an intelligent person as someone able to process information and to respond to situations extemporaneously. This notion is not limited to lay theories of intelligence (e.g., Sternberg, 1985) but is integral to several commonly used IQ and aptitude subtests, such as speeded mental arithmetic in the Wechsler Adult Intelligence Scale (WAIS; see Vernon, 1987). The utility of speeded standardized tests notwithstanding the mere fact that they are perceived to assess intelligence has been shown to adversely impact individuals from socially devalued groups (e.g., African, Americans, Latinos, and people from lower socioeconomic status), leading to documented underperformance relative to higher-status peers (Croizet, Desert, Dutrevis, & Leyens, 2001; Gonzales, Blanton, & Williams, 2002; Spencer & Castano, 2007). This underperformance has been linked with fear of negative evaluation – a phenomenon known as stereotype threat (Steele, 1997), a type of social-identity threat.

Stereotype threat has been implicated in a plethora of negative outcomes for stigmatized individuals. Beyond the broadly documented performance effects (Nguyen & Ryan, 2008), stereotype threat has been linked to executive resource depletion (Johns, Inzlicht, & Schmader, 2008), physiological stress (Blascovich, Spencer, Quinn, & Steele, 2001), inflexible perseverance (using previously successful problem-solving strategies that are no longer effective or appropriate; Carr & Steele, 2009), mind-wandering (Mrazek

*Correspondence should be addressed to Tara Dennehy, Department of Psychology, University of Massachusetts, 135 Hicks Way, Tobin Hall 629, Amherst, MA 01003, USA (email: tdennehy@psych.umass.edu).

DOI:10.1111/bjso.12071
et al., 2011), poorer learning and knowledge acquisition (Taylor & Walton, 2011), lower confidence (Spencer & Castano, 2007), and heightened anxiety (Bosson, Haymovitz, & Pinel, 2004; Osborne, 2001), among other consequences.

Changing a deliberative into an implemental mindset: A novel intervention designed to alleviate stereotype threat

Schmader, Johns, and Forbes’ (2008) Integrated Process Model of stereotype threat delineates how concern with negative evaluation evokes heightened self-monitoring and increased arousal (also see Ben-Zeev, Fein, & Inzlicht, 2005), which co-conspire to deplete working memory resources and to cause underperformance. The concomitant activation of the task-relevant achievement goal of performing quickly and accurately and a task-irrelevant social-evaluation goal of appearing competent and avoiding failure – such that the concern with accuracy comes at the expense of speed (Seibt & Förster, 2004) – gives rise to what Gollwitzer (2012) has termed a deliberative mindset. A deliberative mindset is characterized by selecting ‘from among various wishes and desires, those few that one wants to realize’ (Gollwitzer & Bayer, 1999, p. 405) and by heightened sensitivity to incidental information (Fujita, Gollwitzer, & Oettingen, 2007). In the context of stereotype threat, the parallel goals to succeed (task relevant) and to appear competent (task irrelevant) vie for attentional resources. The deliberation between task-relevant and task-irrelevant (or incidental) goals is an understandable but detrimental reaction to a threat ‘in the air’, which is implied by situational cues rather than by explicit prejudice or stereotypes (Steele, 1997).

Would it be possible for individuals under threat to mitigate the mind’s propensity to become preoccupied with task-irrelevant goals, while simultaneously attempting to fulfil task-relevant ones, via implemental mindset priming (Gollwitzer, 2012)? An implemental mindset – characterized by planning and executing cognitive procedures to realize a pre-selected goal – has been shown to increase task focus in the face of distractions (Freitas, Gollwitzer, & Trope, 2004) and to reduce processing of incidental information (Fujita et al., 2007) and may therefore help to prevent task-irrelevant goal pursuit (e.g., dwelling on social-evaluation concerns; Inzlicht & Ben-Zeev, 2000). Inducing an implemental mindset might thus mitigate the negative effect of ecological cues that signal threat, by helping stigmatized individuals to stay task focused.

In sum, there seems to be an intimate link between mindsets and social-identity threat. It appears that the mindset of threat is marked by deliberation between task-relevant and task-irrelevant goals: a detrimental or ‘inappropriate’ kind of deliberation, such that ‘deliberating the pros and cons of competing goals. . . causes doubts and insecurity instead of an optimistic trust in one’s ability’ (Hiemisch, Ehlers, & Westermann, 2002, p. 105). Priming an implemental mindset might thus prove an effective antidote to extra-task worries and other pernicious effects of intellectually threatening environments (see Inzlicht & Ben-Zeev, 2000).

Mindsets, social identity, and maternal SES (SESm)

To examine the prediction that priming an implemental mindset might help to protect performance under social-identity threat, we selected participants from low- and high socioeconomic status backgrounds as measured by maternal education (SESm)\(^1\) and presented them with a speeded mental arithmetic test: an intelligence-type test that

\(^{1}\) We selected maternal education as an index of socioeconomic status because it has emerged as a leading factor in determining socioeconomic status as a social status versus as an economic position (Bradley & Corwyn, 2002).
has been shown to elicit anxiety about intellectual performance (Ashcraft & Krause, 2007). Of note, socioeconomic status has been linked to stereotype threat effects and performance on intelligence-type tests (Croizet et al., 2001; Croizet & Claire, 1998; Spencer & Castano, 2007) but has been especially under-emphasized in US studies.

In a pilot study, we measured speeded mental arithmetic performance, without a mindset induction, to serve as a stereotype threat baseline for comparing the scores of low- and high-SESm individuals. Stereotype threat theorizing would suggest that low-SESm individuals would perform more poorly on this task because it is connoted with the diagnosticity of intellectual ability (Steele, 1997). In the main study, we induced separate groups of low-SESm and high-SESm individuals with an implemental versus a deliberative mindset prior to completing the same speeded mental arithmetic task.

The main predictions were: (1) in the pilot study, without any mindset induction, high-SESm individuals would outperform low-SESm individuals, reflecting a stereotype threat baseline given the documented adverse impact of speeded intelligence-type tests on people from lower socioeconomic backgrounds (Croizet et al., 2001), but that (2) in the main study, low-SESm individuals would perform similarly to high-SESm counterparts on the speeded mental arithmetic task after being primed with an implemental (but not with a deliberative) mindset. Priming a deliberative mindset was expected to mirror the stereotype threat baseline performance differential between the two SESm groups, whereas priming an implementational mindset was predicted to help low-SESm individuals to stay more task focused in the face of social-evaluation concerns – acting akin to a threat-removed manipulation (Steele, Spencer, & Aronson, 2002).

**PILOT STUDY**

We conducted a pilot study to verify whether a speeded mental arithmetic test would evoke performance differences between low- and high-SESm individuals and to thus establish a stereotype threat baseline for each group’s performance, similar to a real-world test-taking situation. We purposely avoided an explicit manipulation of stereotype threat given findings that blatant/explicit priming of stereotypes sometimes results in contrast effects (Wheeler & Petty, 2001). Furthermore, it is likely that academic environments may be chronically threatening for people from low-SESm backgrounds (see Woodcock, Hernandez, Estrada, & Schultz, 2012).

Participants were 26 undergraduate students at a large university in California who were recruited based on SESm criteria: Maternal education was either less than a high-school education level (low-SESm) or at a college-level education or higher (high-SESm; Ben-Zeev, Dennehy, & Kaufman, 2012). Participants were asked to complete a speeded mental arithmetic task (14 problems in total). Each problem (e.g., 167 + 86 + 375 = 638) was shown on the computer screen for 10 s. As a response to each problem, participants were asked to decide as quickly as possible if the solution was correct on a four-point confidence scale: definitely incorrect, probably incorrect, probably correct, and definitely correct, wherein ‘definitely’ responses indicated high confidence and ‘probably’ responses indicated lower confidence. To set a strict standard

---

2 We agree with Spencer and Castano (2007) that it is important to focus on SES in a culture that purports to have more class mobility than it affords and in which SES is often a ‘concealable stigma’ (Quinn, Kahng, & Crocker, 2004).

3 We had participants who indicate whether the solution was correct or incorrect rather than solving the problems in order to (1) maintain high arithmetic difficulty while preventing floor effects, and (2) mitigate the potential for participants ‘giving up’ when presented with difficult problems.
for accurate responses and to mitigate the potential for accurate guesses, we focused on participants’ accurate ‘definitely’ responses only, for which the probability of guessing the answer was 25% (vs. 50%; the probability of guessing the answer for ‘definitely’ and ‘probably’ responses combined). In agreement with the stereotype threat literature, we expected low-SES\textsubscript{m} individuals to perform worse than high-SES\textsubscript{m} individuals on the speeded mental arithmetic task. This prediction was corroborated: Low-SES\textsubscript{m} individuals performed significantly worse ($M = 0.93$, $SE = .28$) than high-SES\textsubscript{m} individuals ($M = 1.83$, $SE = .26$), $t(24) = 2.37$, $p = .013$, $d = .97$.\textsuperscript{4}

This baseline performance differential was consistent with the expectation that a speeded mental arithmetic task would create situational threat for low-SES\textsubscript{m} individuals (also see Spencer & Castano, 2007). It is possible, however, that these data simply reflected an intrinsic differential aptitude between the two SES\textsubscript{m} groups and not a stereotype threat baseline. If so, the subsequent manipulation of an implemental mindset would not be predicted to equate performance between the two SES\textsubscript{m} groups, but would rather showcase similar performance superiority for high-SES\textsubscript{m} individuals. If inducing an implemental (vs. a deliberative) mindset would help to equalize performance of the two SES\textsubscript{m} groups, however, then priming an implemental mindset would act akin to a threat-removed intervention and could prove to be a promising tool for alleviating situational underperformance due to social-identity threat.

**MAIN STUDY**

**Method**

**Participants**

Fifty-nine undergraduates at a large university in California were recruited based on SES\textsubscript{m} criteria. Two participants were dropped due to failure to follow the mindset manipulation instructions, resulting in a final sample of 57 participants.\textsuperscript{5}

**Design**

We employed a 2 (mindset: implemental vs. deliberative) x 2 (SES\textsubscript{m}: low vs. high) between-subjects factorial design.

**Procedure**

Participants were recruited to ostensibly pilot test a newly created standardized aptitude test, which allegedly assessed diverse problem-solving abilities. All participants were informed that the test would be timed and that they would be operating under time pressure. There was no explicit manipulation of threat because a speeded mental arithmetic test alone should be sufficient to threaten people from academically stigmatized groups. Participants from high- and low-SES\textsubscript{m} backgrounds were randomly

\textsuperscript{4} Although fewer accurate definitely responses could indicate lower certainty as well as lower performance, the same pattern was observed for all accurate responses (both ‘definitely’ and ‘probably’ responses), which substantiates this finding being a performance effect.

\textsuperscript{5} Although the sample size was constrained due to difficulty in recruiting a sufficient number of low-SES\textsubscript{m} individuals, a post-hoc power analysis using G\textsuperscript{*}Power (Erdfelder, Faul, & Buchner, 1996) revealed that the obtained power indeed reached the conventional threshold of .80 (Cohen, 1988). Based on a Cohen’s $f^2$ of .379, power for the mindset by SES\textsubscript{m} interaction was .802.
assigned into the implemental or deliberative mindset priming conditions. We adapted an experimental scenario from Hiemisch et al. (2002) about a hypothetical conflict with a faultfinding work colleague. Participants in the deliberative mindset condition were asked to generate at least four different important goals, such as ‘Stand up to my colleague about his comments (Goal 1)’, versus ‘Approach my colleague for feedback on how to perform better (Goal 2)’, and to then elaborate on the advantages and disadvantages of each potential goal. In contrast, participants in the implemental mindset condition were provided with a conflict resolution goal and were asked to generate multiple problem-solving steps to achieve it. Specifically, participants were instructed to identify and to describe at least four different problem-solving steps and their order of execution, such as, ‘Step 1: Ask another colleague for advice on the best way to talk to the senior colleague, Step 2: Ask the senior colleague if we can speak privately’, etc. Participants were then asked to complete the speeded mental arithmetic task from the pilot. Participants decided as quickly as possible if the solution to each mental arithmetic problem was correct on a four-point confidence scale: definitely incorrect, probably incorrect, probably correct, and definitely correct. Finally, participants filled out a demographic questionnaire and were debriefed.

Results and Discussion
To examine the effects of mindset by SES on performance, we analyzed the number of accurate definitely responses (definitely correct to correct solutions and definitely incorrect to incorrect solutions), echoing the rationale in the pilot. The only statistically significant effect was the predicted mindset by SES interaction, $F(1, 53) = 8.47$, $p = .005, \eta^2_p = .138$, such that priming an implemental (but not a deliberative) mindset appeared to eradicate the performance differential between the SES groups found at baseline. Specifically, low-SES individuals in the deliberative mindset condition ($M = 0.67, SE = .38$) performed worse than low-SES individuals in the implemental mindset condition ($M = 2.25, SE = .38$), $t(26) = 2.74, p = .011$, and high-SES individuals in both the implemental ($M = 1.77, SE = .32$), $t(27) = 2.87, p = .008$, and deliberative ($M = 2.25, SE = .32$) mindset conditions, $t(22) = 4.18, p < .001$ (see Figure 1). In contrast, low-SES individuals in the implemental mindset condition performed just as well as high-SES counterparts in both the implemental, $t(31) = .90, p = .37$, and deliberative, $t(26) < .001, p = 1.0$, mindset conditions. No other effects approached significance. Furthermore, low-SES individuals in the implemental mindset condition performed similarly to high-SES individuals in the pilot study, which supports the idea that priming an implemental mindset could act akin to a threat-removed manipulation (see Steele et al., 2002).

An alternate interpretation of this finding is that it is indicative of shaken confidence rather than poorer accuracy. Such an interpretation would not necessarily be incompatible with stereotype threat, however. Spencer and Castano (2007) found that individuals from low socioeconomic backgrounds experienced lower confidence in addition to underperformance under stereotype threat for increased arousal and anxiety under

---

6 As a manipulation check, we recruited 66 additional participants who completed only the mindset manipulation followed by manipulation check questions rated on a 1–9 scale from not at all to completely (e.g., ‘Do you already know when, where, and how to take action to address this conflict with your colleague?’), adapted from Brandstätter and Frank (2002). Participants in the implemental condition were significantly more prepared to take action to resolve the conflict ($M = 6.82, SE = .282$) than participants in the deliberative condition ($M = 5.59, SE = .372$), $t(64) = 2.63, p = .011, d = .65$. 

---

**Mindsets and social-identity threat 589**
threat, see Bosson et al., 2004; Osborne, 2001). To examine the concern that our findings simply reflected shaken confidence, we conducted an additional analysis on the total number of accurate responses (all definitely and probably responses combined). The only statistically significant effect was the predicted mindset by SES interaction, $F(1, 53) = 6.54, p = .013, \eta^2_p = .11$, such that priming an implemental (but not a deliberative) mindset appeared to boost low-SES$_m$ individuals’ performance, replicating the pattern observed in the definitely-only analyses. This analysis lends further credence to the conjecture that implemental mindset priming can serve as a performance buffer for low-SES$_m$ individuals under threat.

Another plausible interpretation of this finding, however, is that low-SES$_m$ individuals may have felt societal pressure to be modest in performance domains to prevent backlash arising from violating group stereotypes (see Rudman & Fairchild, 2004), such that an implemental mindset served to reduce backlash concerns. This modesty-based interpretation is consistent with findings that working class people provide lower self-estimates of their abilities relative to middle class counterparts (Ivcevic & Kaufman, 2013). To test this proposition, we asked 69 high- and low-SES$_m$ individuals to report how desirable it is to be accurate versus modest when taking a difficult math test, and the degree to which they would be concerned about being perceived as arrogant versus incompetent on such a test. High- and low-SES$_m$ individuals did not differ in their valuations of accuracy versus modesty, $t(67) = .147, p = .884, d = .03$, nor in their concerns about being perceived as arrogant versus incompetent, $t(68) = .816, p = .417, d = .19$. These data suggest that our low-SES$_m$ participants would likely not have felt more pressure to be modest than high-SES$_m$ individuals. Instead, the current findings support our prediction that implemental mindset priming may be a useful tool for creating equity in the face of stereotype threat.

**GENERAL DISCUSSION**

Priming socially devalued (low SES$_m$) individuals with an implemental (vs. a deliberative) mindset, characterized by forming a priori goal-directed plans, appears to help these individuals to overcome threat-induced distracting states. This finding – that low-SES$_m$ participants induced with an implemental mindset performed equivalently to their high-SES$_m$ peers on a difficult speeded arithmetic test – generates optimism in the face of
the documented negative consequences of stereotype threat. Learning to induce an implemental mindset is feasible and beckons ecologically rich investigations on mindset-based educational interventions. Specifically, it might be useful to examine the effects of more specialized implementation intentions or cue-dependent contingency plans (e.g., ‘If I encounter situation x, then I will perform the goal-directed behavior y!’ per Bargh, Gollwitzer, & Oettingen, 2010, p. 282) on alleviating the harmful effects of social-identity threat (e.g., ‘If I am asked to multiply a whole number by a decimal, I will first round the decimal to a whole number and then adjust the estimate’; also see Bayer & Gollwitzer, 2007).

An implemental mindset intervention contributes to the existing toolbox of empirically supported interventions for stereotype threat (for a review, see Cohen, Purdie-Vaughns, & Garcia, 2012). These interventions are quite varied, targeting both environmental factors and stigmatized individuals’ internal states. A subset of these interventions have highlighted the benefits of teaching people to reappraise test-related anxiety and arousal as helpful (Jamieson, Mendes, Blackstock, & Schmader, 2010; Johns et al., 2008), and to re-evaluate threatening situations as challenging rather than threatening (e.g., Alter, Aronson, Darley, Rodriguez, & Ruble, 2010). Related interventions have manipulated participants’ approach versus avoidance goals (manipulations of regulatory focus; see Seibt & Förster, 2004). Although at face value, these interventions may seem similar to mindset induction, our data support a differentiation between implemental mindset priming and manipulations of regulatory focus. If implemental mindsets induce a promotion focus – or working towards a goal with an approach motivation – the literature on regulatory fit (Higgins, 2000) would afford the prediction that implemental mindset priming would hinder – not help – the performance of threatened individuals given evidence that prevention (not promotion) focus is associated with better performance under threat (Chalabaev, Major, Sarrazin, & Cury, 2012).

In contrast to many existing interventions, implemental mindset priming does not rely on invoking positive identities (an exercise that might be difficult in the face of intersectionality and multiple threatened identities) nor on the ability to engage in and to sustain cognitive reappraisal, which might be challenging for people whose executive resources are chronically depleted (see Mani, Mullainathan, Shafir, & Zhao, 2013; for how poverty diminishes cognitive capacity). As such, this potentially scalable intervention may be appropriate for people dealing with multiple threatened identities (Gonzales et al., 2002) or people with chronic deficits in executive functioning for whom reappraisal itself might constitute an extra-task demand (e.g., individuals with ADHD; Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005; people in poverty, Mani et al., 2013). The current study thus serves as a first step in establishing implemental mindset priming as one effective intervention for mitigating stereotype threat among members of an invisible stigmatized group: low-SES_m individuals. This finding is of particular import considering a recent report linking low parental SES with long-term negative consequences for educational attainment in Britain and Sweden (Bukodi, Erikson, & Goldthorpe, 2013).

There are potential limitations to implemental mindset priming as an intervention for stereotype threat, however. We do not yet fully understand when implemental versus deliberative mindset priming would be useful. It is possible that this intervention would be specific to standardized tests that require more fixed or crystallized intelligence rather than tests requiring fluid intelligence (Cattell, 1963). We encourage research on such topics, including whether a deliberative mindset might foster greater creativity on tests of fluid intelligence as compared to an implemental mindset. Further research would also be needed to investigate whether implemental mindset priming would provide similar
performance benefits to stigmatized individuals in cultures where holistic processing styles are predominant (as compared to the United States, where analytic processing is more common; Masuda & Nisbett, 2001).

In conclusion, the finding that implemental mindset priming improves performance for low-SES individuals under threat fits within a burgeoning literature on mindsets, implementation intentions, self-regulation, and their implications for social evaluation and performance in a stereotype threat context. All told, a ‘be prepared’ motto-turned-mindset appears promising as a useful tool for alleviating social-evaluation concerns under social-identity threat.

References


Received 24 September 2012; revised version received 20 February 2014