

## **Lingering Effects: Stereotype Threat Hurts More than You Think**

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*Starting with the first realization that negative stereotypes can cause people to underperform in the stereotyped domain, an impressive body of work has documented the robust and wide-ranging nature of stereotype and social identity threat. In this article, we look beyond the stereotyped ability domain and present evidence that coping with stereotypes and prejudice can linger, affecting a broad range of behaviors even in areas unrelated to the stigmatized ability. This stereotype threat spillover occurs because coping with negative stereotypes and prejudice leaves self-control resources depleted for challenges that arise later, even in unrelated situations. We suggest a number of different ways that individuals can empower and hopefully inoculate themselves against spillover including shifting appraisals and adopting positive coping strategies. We also discuss societal changes, encouraging governments and other organizations to enact policy that will reduce the prevalence of stereotyping and cultivate feelings of intrinsic motivation to reduce prejudice.*

In their now famous paper, Steele and Aronson (1995) laid the foundations for what came to be known as *stereotype threat*; the apprehension targets feel when negative stereotypes about their group could be used as a lens through which to judge their behaviors. Stereotype threat is a situational predicament where

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individuals suspect that their behaviors could be judged based on negative stereotypes about their group (Inzlicht & Schmader, 2011; Steele, 2010; Steele, Spencer, & Aronson, 2002). When negative stereotypes are widely known, anything a person says or does that is consistent with the stereotype lends credence to the stereotype as a self-characterization. This threat of confirming negative stereotypes introduces extra-task concerns, which distract from performance and can ultimately result in stereotype confirmation. According to Steele and Aronson, one of the reasons Black students tend to perform worse than White students in school is because stereotypes are “in the air” (Steele, 1997; Steele, 2010), on Black students’ minds, arousing deep-seated fears and distracting them from doing as well as they could.

What is more, Steele and his colleagues (2002) suggest that stereotype threat falls under the broader category of *social identity threat*, which results from anxiety about one’s social category being devalued (Tajfel & Turner, 1986). This broader conception of threat includes any situation that contains the risk of marginalization, not only when stereotypes are “in the air,” but also when environmental cues hint that one’s social identity makes one vulnerable to devaluation, exclusion, and biased treatment. So, for example, being exposed to prejudice can lead to social identity threat.

Two decades of research have followed Steele and Aronson’s (1995) landmark paper and have confirmed the view that when people consider stereotypes that target their groups, or when they face implicit or explicit prejudice, their performance tends to suffer in the stereotyped or stigmatized domain. This stereotype threat (Steele, 2010) can ultimately interfere with intellectual functioning and academic engagement, setting the stage for later differences in educational attainment, career choice, and job advancement. General information about stereotype threat can be found at <http://reducingstereotypethreat.org>, which acts as a general resource for academics and the public alike. So the prominent race, gender, and ethnicity gap in academic attainment can be explained, at least in part, by the power of the situation.

But, can coping with negative stereotypes or prejudices affect people beyond the realm of the stereotyped domain? Can stereotype threat, in other words, hurt more than we think it can, contributing not only to academic performance gaps, but also to gaps in other spheres of life? This is the central question of this article.

### *Beyond Performance in Stereotyped Domains*

Whether we are talking about stereotype or social identity threat, the consequence is well known: two published meta-analyses attest to the robust effect of threat on performance in stereotyped domains (Nguyen & Ryan, 2008; Walton & Cohen, 2003). However, given that individuals exist in a variety of contexts and circumstances and live lives replete with much more than performing tasks

in stereotyped domains, it is surprising that very few studies have gone *beyond performance* or *beyond stereotyped domains* to examine other important consequences of stereotype threat. In this article, we outline new research on stereotype threat that does just this.

We look beyond the traditional types of performance and domains investigated by stereotype threat researchers to show that the effects of stereotype threat reach further than previously thought. We examine how encounters with stereotypes or prejudice can affect people even in nonstereotyped domains, even in “safe” situations where there is little risk of being the target of prejudice. The implication is that coping with negative stereotypes and dealing with prejudice can have lingering effects, hurting people in a broad range of outcomes.

The article is divided into two broad sections. In the first section, we outline theory and empirical research on a phenomenon we call *stereotype threat spillover*, which we define as a situational predicament whereby coping with negative stereotypes leaves one in a depleted volitional state and, thus, less able or willing to engage in a variety of tasks requiring effortful self-control (Inzlicht & Kang, 2010). We suggest that stereotype and social identity threat have lingering effects that continue to influence people after they leave threatening environments, such that it has residual effects on behavior even in areas unrelated to the impugning stereotype.

In the second section, our focus shifts from the problem to possible solutions, first at the level of the individual and then of society as a whole. We suggest a number of different ways that individuals can empower and hopefully inoculate themselves against the effects of stereotype threat including shifting appraisals and adopting positive coping strategies, such as those fostered by mindfulness meditation. In terms of society-wide change, we suggest that society—in the form of governments, business organizations, and academic institutions—take serious steps to reduce or change the content of group-based stereotypes, for example that women are not skilled at math and science, and steps to reduce discrimination, such as sexist remarks and comments. This type of policy-level change is instrumental in eradicating problems related to stereotype threat at their very root—the continued existence and propagation of stereotyping, prejudice, and discrimination. We begin with an overview of theory and research on stereotype threat spillover.

### **Theory and Research on Stereotype Threat Spillover**

The consequence of stereotype threat on performance in stereotyped domains is widely known, with nearly 200 separate articles examining performance deficits (Inzlicht & Kang, 2010). In this article, and in this section, we look beyond performance in stereotyped domains and ask what happens after people leave threatening environments.

### *From Stereotype Threat to Stereotype Threat Spillover*

Although we think that performance in traditionally studied stereotyped domains, especially academic domains, is of paramount importance, we focus here on a problem that is much less studied but equally important: the problem of lingering effects of stereotype threat, of what happens to people *after* they leave threatening environments. We explore whether stereotype threat affects people only during the time they spend in threatening environments—for example, in a testing session—or, more likely, if this experience had residual effects beyond this environment, spilling over into other aspects of people’s lives. Adopting this broader perspective allows for an expansion of the original theory to cover not only domains where people are denigrated and unwelcome, but also domains that are usually thought to be stereotype-free. This article explores these broad consequences of stereotype threat via the phenomenon of *stereotype threat spillover* (Inzlicht & Kang, 2010).

Stereotype threat spillover is a phenomenon that occurs, paradoxically, *after* people have left threatening environments (Inzlicht & Ben-Zeev, 2000), after they have stopped worrying that they are being judged based on the group to which they belong. It occurs because their time spent *in* the threatening environment was emotionally and cognitively taxing (Johns, Inzlicht, & Schmader, 2008; Schmader & Johns, 2003). Threatening environments oblige people to cope with negative stereotypes and prejudices, and this can leave them in depleted volitional states wherein they are less able or willing to engage in a variety of tasks requiring effortful self-control. Because of this, stereotype and social identity threat continues to influence people after they leave threatening environments, such that it has residual effects on behavior even in areas unrelated to the impugning stereotype. For example, even though the experience of stereotype threat for Black college students involves coping with negative stereotypes about their group’s academic ability, this experience could spill over to affect them outside of the classroom. For example, it could affect their physical stamina in a game of pick-up basketball, or their ability to resist delicious chocolate cake offered at the cafeteria, or even their capacity to do their chores when they return home. To appreciate how stereotypes can spill over into other domains, we start by describing the processes involved in coping with stereotype and social identity threat (see also Inzlicht, Aronson, & Mendoza-Denton, 2009; Inzlicht & Good, 2006; Inzlicht, Tullett, & Gutsell, 2011).

### *Mechanics of Stereotype Threat*

At the most basic level, stereotype and social identity threat are sources of stress (Clark, Anderson, Clark, & Williams, 1999; Pascoe & Richman, 2009) and should be seen as very similar, psychologically, to the other stressors that targets

of prejudice need to deal with, things such as economic hardships, poor housing, and even the chronic threat of physical violence (Allison, 1998). As such, threat should be viewed within the broader framework of stress and coping models (e.g., Lazarus & Folkman, 1987). According to a number of theoretical perspectives (e.g., Dion, 2002; Major & O'Brien, 2005; Miller & Kaiser, 2001), stereotype and social identity threat, once appraised, could result in a number of physiological, emotional, cognitive, and behavioral reactions that are distinguished along the lines of involuntary stress reactions and voluntary coping responses.

As soon as one appraises a situation as identity threatening, a series of involuntary stress responses takes hold—a physiological stress response due to increases in arousal (Ben Zeev, Fein, & Inzlicht, 2005; Blascovich, Spencer, Quinn, & Steele, 2001) and distracting thoughts (Cadinu, Maass, Rosabianca, & Kiesner, 2005) that consume limited working-memory resources (Beilock, Ryell, & McConnell, 2007; Schmader & Johns, 2003). These involuntary stress responses activate their attendant voluntary coping strategies. Essentially, individuals are motivated to disconfirm negative stereotypes and expend great effort to do so (Jamieson & Harkins, 2007). However, this goal is often compromised by the use of maladaptive coping strategies. It turns out that people “naturally” cope with negative stereotypes maladaptively—they suppress the powerful thoughts and emotions activated by the situation. They try to push the thought of stereotypes out of their minds, actively trying not to think about them (Logel, Iserman, Davies, Quinn, & Spencer, 2009). They also deny the arousing emotions they are feeling, actively and effortfully avoiding them and trying to suppress their bodily manifestations (Johns et al., 2008).

What will be critical as we later explore policy implications is that this stress and coping account also suggests that stereotype threat need not always result in poor performance. A person under stereotype threat can perform at the same level as a nonthreatened person, but would need to use more adaptive coping strategies to do so (e.g., Inzlicht, Aronson, Good, & McKay, 2006). That is, performance tends to suffer when people cope with stereotype stress by doing things such as suppressing emotions, blocking sensations, and denying thoughts. These coping strategies occur after people have already experienced full-blown emotions, and they can tax executive resources in the process (Richards & Gross, 2000). If, instead, a person were to use less resource-intensive coping strategies before appraisals give rise to the full syndrome of responses (Gross & Thompson, 2007), this person may be spared the full effects of stereotype threat. For example, stereotype threat is diminished when people cope with it by misattributing their emotions (Ben-Zeev, Fein, & Inzlicht, 2005), correctly attributing them (Johns, Schmader, & Martens, 2005), or reappraising the situation (Johns et al., 2008). Stereotype threat, then, affects performance not because of stress per se, but because of the ways that people cope with it. This means that interventions will be successful to the extent that they can help people cope more adaptively, something

we will expand upon in the next section. Unfortunately, the typical strategy is response-focused (e.g., Johns et al., 2008), leaving people depleted for subsequent tasks.

Research in social neuroscience is consistent with this stress and coping approach. Recent neuroimaging evidence suggests that stereotype threat leads to abnormal recruitment of neural networks in the rostral-ventral anterior cingulate cortex (ACC), areas associated with the regulation of negative and self-conscious emotions (Krendl, Richeson, Kelley, & Heatherton, 2008; Wraga, Helt, Jacobs, & Sullivan, 2007; see also Derks, Inzlicht, & Kang, 2008). Instead of activating brain regions related to performing well, those under stereotype threat recruit brain regions linked with increased emotional load. Performing under stereotype threat, therefore, is akin to a dual-task paradigm, with emotions and cognitions competing with the same limited executive resource as those required by the central task—and, importantly, by many tasks that arise after one has left the threatening environment.

What all of these reactions—voluntary and involuntary, stress and coping, cognitive and emotional—have in common is that they lead to processing inefficiencies via depleted executive resources (Schmader, Johns, & Forbes, 2008). Each of these putative reactions taxes executive control, the cornerstone resource needed for skilled performance in virtually any challenging cognitive task. The end result is that people coping with stereotype and social identity threat have fewer resources to focus on the task at hand, performing well on a test.

So here is a social-psychological explanation that offers at least a partial explanation for some of the persistent gaps in academic performance that exist worldwide, be that between Blacks and Whites (National Assessment of Educational Progress, 2009), men and women (College Board, 2010), rich and poor (Croizet & Millet, 2011), or Christian and Muslim (Levels & Dronkers, 2008). When individuals who belong to groups stereotyped as being inferior in some domain operate in that domain—say, when a woman who faces the stereotype that “girls are no good at math” takes a standardized math test—they face the possibility that their behavior can confirm the negative stereotype as self-descriptive. This possibility increases involuntary stress responses, including anxiety and distracting thoughts, which are typically met by coping attempts that involve suppressing the powerful thoughts and emotions activated by this possibility. Although this process of coping can be effective, more often than not, it consumes executive control resources, and result in people underperforming in stereotyped domains.

Traditional conceptualizations of stereotype threat end right here, with poor performance in a stereotyped domain. However, given what we know about the process of stereotype threat and the nature of executive control, we suggest that stereotype and social identity threat can continue to have effects after people have finished their test and left the threatening environment. What is unique about our model is that it addresses what happens after people have taken the test, after

they have left the threatening environment. Because executive control is used to manage the effects of stereotype and social identity threat (Schmader et al., 2008), there is less executive control that will remain for the central performance task—and, importantly, there is less that will remain after people leave the threatening environment. Stereotype threat, in other words, can have lingering effects in nonstereotyped domains; it can spill over even after people have left threatening environments, because it leaves people with diminished executive control resources in a state known as “ego depletion” (Muraven & Baumeister, 2000).

### *Ego Depletion and Stereotype Threat Spillover*

Ego depletion refers to a state of compromised self-control ability, of having little mental energy to overcome environmental temptations and override urges, emotions, and automatic response tendencies. According to work in this area (e.g., Baumeister & Heatherton, 1996), self-control is a central volitional resource very much akin to what is colloquially known as “willpower.” One of its key features is that it is limited; engaging in a self-control task at time 1 affects later self-control performance at time 2. A second key feature is that self-control is thought to rely on a central resource, underlying many seemingly unrelated behaviors (Baumeister, Heatherton, & Tice, 1994). A recent meta-analysis of nearly 100 separate studies confirms both of these features, with initial acts of control resulting in losses to subsequent control with minimal variation of this basic effect across task domains (Hagger, Wood, Stiff, & Chatzisarantis, 2010).

For example, suppressing thoughts and emotions, which requires effortful control (Wegner, 1994), can lead to subsequent failures of self-control as evidenced by poor exam results (Schmeichel, Vohs, & Baumeister, 2003), inappropriate aggressive responding (Stucke & Baumeister, 2006), overeating (Vohs & Heatherton, 2000), overreliance on heuristics to make decisions (Masicampo & Baumeister, 2008), poor physical stamina (Muraven, Tice, & Baumeister, 1998), and unfocused attention (Inzlicht & Gutsell, 2007). It is still unclear why initial acts of self-control hurt subsequent ones. Although it is possible that ego depletion comes about because self-control does in fact rely on a limited resource (Gailliot et al., 2007; but see Kurzban, 2010), it is also likely that depletion can result from changes in motivation (Muraven & Slessareva, 2003; Robinson, Schmeichel, & Inzlicht, 2010), impulsivity (Schmeichel, Harmon-Jones, & Harmon-Jones, 2010), or basic emotionality (Gutsell & Inzlicht, 2010). Regardless of how ego depletion operates, the point remains the same: when people engage in self-control at one moment, they will be less likely or able to engage in control in a subsequent moment.

With this logic, it is simple to see how stereotype threat can spill over, how it can have lingering effects even after people have left threatening environments. It occurs precisely because of what happens when people are immersed in

threatening environments, where they typically cope by trying to manage their emotional and cognitive responses (Johns et al., 2008; Logel et al., 2009). This is a resource-demanding strategy requiring self-control (Gross & Thompson, 2007), leaving people in a depleted state where they are less able or willing to engage in tasks requiring further control. Given that self-control is limited and that stereotype threat taxes it, it follows that stereotype threat will leave people with fewer volitional resources to perform—even on nonstereotyped tasks.

Returning to the example of Black college students facing negative ability stereotypes, if they cope with their predicament by suppressing thoughts of the impugning stereotype or by denying feelings of anxiety and apprehension, they would have less willpower to pursue other tasks afterward; they would have had a harder time with any task requiring self-control. And given the breadth of behaviors and activities that rely on deliberative control, this suggests that they would have a harder time with many, many pursuits. In short, because coping with threat is depleting, stereotype threat can spill over and continue to influence people after they leave threatening environments—even in areas unrelated to the impugning stereotype. We now turn to empirical evidence that supports this model.

### *Stereotype Threat Has Lingering Effects*

*Eating.* Our first attempt at documenting stereotype threat spillover involved a simple correlational study relating vulnerability to threat with self-regulated learning (Inzlicht, McKay, & Aronson, 2006; Study 1). The logic was straightforward: people who are the most sensitive to the prejudices against their group will experience the most social identity threat (Aronson & Inzlicht, 2004), but also the most difficulty in regulating their own behaviors. We first examined Black university students' reports of how well they were able to regulate their own learning with items such as "how well can you study when there are other interesting things to do" or "how well can you arrange a place to study without distractions" (Pajares & Valiante, 2006). Results indicated that the more Black students were sensitive to race-based rejection (Mendoza-Denton, Downey, Purdie, Davis, & Pietrzak, 2002), the less they reported regulating their learning behaviors. So, something about being sensitive to group-based prejudices contributed to these Black students' problems regulating their behavior.

This was the first bit of evidence that sensitivity to discrimination is related to problems with self-control. It was not, however, evidence for spillover into nonstereotyped domains, given the prevailing stereotypes about Black's academic abilities (Steele, 2010). We then ran two more correlational studies, this time examining sensitivity to discrimination among Muslims and women and relating it to weight and obesity (Kang & Inzlicht, 2010). Healthy eating requires that people monitor food intake and overcome temptations to eat high-calorie food, both of which require ongoing engagement of self-regulatory resources to be successful



(Vohs & Heatherton, 2000). If coping with social identity threat consumes executive resources, it should also reduce the ability to overcome the impulse to eat tempting foods. In the long run, this means that the more people are vulnerable to threat, the more problems they should have regulating their food intake and the more they should weigh.

This is precisely what we found (Kang & Inzlicht, 2010). Among Muslim students, the more they were sensitive to prejudice against their group, the more they weighed and the greater the likelihood that they were obese. The same was true for women: the more they were sensitive to being treated unfairly, the higher their body mass index and the more likely they were to be classified as obese. We find these data startling. Obesity is associated with chronic illness and is widely considered to have reached epidemic levels in a number of Western nations (e.g., Mokdad et al., 1999), and here we have documented that it is associated to some general sensitivity to discrimination. But can coping with stereotype and social identity threat actually cause obesity? Of course, there are many reasons why someone may be obese—for example, biology and culture—so results linking threat with obesity do not necessarily implicate a loss of self-control. We found stronger evidence in a separate study showing that threat can cause overeating.

In this experimental study, we brought women into the lab, asked them take a diagnostic math test, and then, in an ostensibly separate study, gave them the opportunity to eat up to nine scoops of ice cream (Inzlicht & Kang, 2010; Study 2). Given prevailing stereotypes about women's poor math and science skills, when they take math tests that are capable of diagnosing their strengths and weaknesses, they typically need to cope with stereotype threat and underperform as a result (Spencer, Steele, & Quinn, 1999). The women in our control group took the same diagnostic test as those in the threat group, but we also armed them with an effective coping strategy—we asked that they reappraise the test situation by looking at it objectively and neutrally, as if they were professional test evaluators. Such reappraisal instructions eliminate the need to suppress thoughts and emotions in order to cope with the threat, thereby saving participants' self-control resources (Richards & Gross, 2000). We did not give women in the threat group any further instruction about how to cope with the situation and presumably they engaged in the resource-depleting coping strategy typical of those under threat—suppressing emotions and cognitions (Johns et al., 2008; Logel et al., 2009). The results suggested that stereotype threat could indeed have lingering effects. Women who coped with stereotype threat “naturally” ate more ice cream than those who coped by reappraising the situation. Results, in other words, indicated that stereotype threat could spill over, affecting not only women's math performance, but also how much they allowed themselves to eat. Furthermore, the more women were sensitive to sexism, the more they overate.

Here is direct evidence that dealing with stereotypes in one domain (math) could affect behavior in an unrelated domain (eating). The quality of the evidence

is also an improvement over our initial correlational findings, with stereotypes clearly leading to problems regulating food intake. So, what other domains are vulnerable to spillover?

*Endurance and aggression.* It turns out that stereotype threat can spill over into the domain of physical endurance (Inzlicht et al., 2006) and even aggression (Inzlicht & Kang, 2010). Again looking at women, we found that coping with stereotype threat during a math test could lead them to have less physical endurance afterwards. In this study (Inzlicht et al., 2006; Study 3), women expected to take a diagnostic math test, or in the control group, a diagnostic verbal test. After working on a number of practice test items, they were given a hand exerciser and told to continuously squeeze it for as long as they could. Because this exercise becomes uncomfortable quickly, willpower is needed to overcome the physical discomfort and persist on the task (Muraven et al., 1998). Compared to the women expecting to take the verbal test—a domain where women need not cope with negative stereotypes—those who took the math test held onto the hand exerciser for less time. Coping with negative stereotypes about math, in other words, affected how long women could persist on a physical exercise.

Stereotype threat can also affect whether women become violently aggressive (Inzlicht & Kang, 2010; Study 1). While aggressive impulses are various and common, aggressive behavior is not; people generally inhibit and control such impulses. Ego-depleted individuals lack this impulse control and are more aggressive as a result (Stucke & Baumeister, 2006). If stereotype threat results in ego depletion, it could also lead to unrestrained aggression. As with the other studies, women took a diagnostic math test with no further instructions or with instructions to reappraise the test in a neutral way (Richards & Gross, 2000). After leaving the threatening situation, participants completed an unrelated competitive reaction-time game, ostensibly against their partner. In this task, whoever responded quicker to a target was allowed to punish their partner by sending bursts of white noise to their partner's headphones. Importantly, participants got to select how loud the white noise would be and for how long it would be delivered. Louder noises delivered for more time were considered more aggressive (Bushman & Baumeister, 1998). Results were consistent with spillover: compared to those who reappraised the situation, women who coped with stereotype threat "naturally" were nastier to their partners, shooting them with noise that was louder and longer.

As with the results with spillover and eating, we find these results startling. Here is evidence that stereotype threat has lingering effects, affecting something as important as whether or not someone acts aggressively. We wonder if this suggests that stereotype threat could contribute to the controversial issue of a "race-gap" in criminality. Although contentious and widely debated (Sampson & Wilson, 1995), research repeatedly suggests racial and ethnic differences in the rates of

violent crime in the United States, such that more crime is committed by members of stigmatized racial groups (e.g., Hawkins, Laub, & Lauritsen, 1998; Morenoff, 2005). Research in sociology and criminology offers a number of explanations for this phenomenon, including the overrepresentation of stigmatized racial groups in poor neighborhoods (Krivo & Peterson, 1996) and a biased criminal justice system (Chambliss, 1994). We wonder if we should add to this a social-psychological explanation: stereotype threat spillover could explain a significant, even if small, portion of this race-gap. Hard and constant exposure to stereotype and social identity threat could leave stigmatized individuals chronically depleted and less able to restrain impulses, including aggressive and violent ones. Indeed, this possibility is consistent with modern theories of crime, which depict crime as the result of some breakdown in restraint and self-control (Gottfredson & Hirschi, 1990). Clearly, more research is needed to address this important possibility.

*Self-control.* We found more evidence for spillover in other domains. For example, we found that women who just coped with negative stereotypes about women's alleged math inferiority spent less time on a challenging word puzzle (Inzlicht & Hickman, 2004). These are important findings because they speak to the generality of the basic spillover effect and are consistent with the view that coping with stereotype threat can have lingering effects. However, none of these findings reveal a direct link between stereotype threat and lack of control, so they cannot inform us of the mechanism behind the effect. To shed light on this issue, we examined performance on the Stroop color-naming task, a canonical measure of executive control, specifically the inhibition of an automatic reading response (Miyake et al., 2000). If coping with threat is indeed depleting, it should affect performance on this axiomatic measure of control.

In one study (Inzlicht et al., 2006; Study 2), Black and White students expected to take a diagnostic GRE-style test—a situation that activates negative race stereotypes for Blacks but not Whites (Steele & Aronson, 1995). Afterwards, everyone completed the Stroop color-naming task, which involves seeing color words printed in various colors. Sometimes the semantic meaning of the word and the color of the word matched (e.g., seeing “red” in red) and sometimes they did not (e.g., seeing “red” in green). Participants had to name the color of the word, which can be difficult because it requires controlling one's natural tendency to read the word. What we found was that the Black students who had worked on the diagnostic test had a harder time controlling their natural impulse to read the words; they exhibited less attentional control than Whites or than Blacks expecting to take a “nondiagnostic” test. So their previous experience coping with threat hurt their ability to stay on task and pay attention in a nonthreatening situation.

So here, finally, is evidence that stereotype threat can directly hurt executive resources, specifically the verbal resources (Beilock et al., 2007) that are so crucial for self-control (Tullett & Inzlicht, 2010). What is more, stereotype threat affects

brain systems associated with control (Inzlicht & Kang, 2010; Study 4). In an additional study, men and women took a diagnostic math test and were required to cope “naturally” or encouraged to reappraise their emotions. After the test, participants completed the Stroop task while we recorded brain activity. Showing the same, now familiar, pattern of spillover, female participants who coped “naturally” with threat performed worse on the Stroop than men or women who coped by reappraising the situation. Importantly, this spillover into attentional control was mediated by a curious pattern of brain activity. Specifically, coping with threat led to inefficient activity in the ACC, a brain region that is richly interconnected with both limbic and prefrontal areas of the brain, and is thought to serve an alarm function, alerting when control and remediation are needed (Bartholow et al., 2005). People who previously coped with threat showed brain activity suggesting that they were not efficiently monitoring their performance; instead, they were alerting and orienting to all aspects of their performance, even to those where control was not necessary. Having just experienced stereotype threat, it seems, affects the ACC-based performance monitoring system in a way that renders it inefficient and, in the process, impairs effective self-control. So, stereotype threat can spill over; but what about social identity threat—can it spill over too?

*Social identity threat spillover.* While it is true that up until now we have only described correlational data linking a sensitivity to prejudice with things that suggest spillover—for example, higher obesity rates (Kang & Inzlicht, 2010) and more overeating (Inzlicht & Kang, 2010; Study 2)—there are also good experimental data suggesting social identity threat spillover. In one study, we had people spend 5 minutes vividly recalling, imagining, and writing about moments when they were targets of prejudice (Inzlicht & Kang, 2010; Study 3). What is interesting about this study is that people were free to remember and write about instances where they were targets of prejudice based on any one of their social identities—and people wrote about being a target because of their race, religion, gender, age, and sexual orientation. After vividly remembering these instances, participants were given a simple choice between two lotteries, one that was high risk with a large payoff versus a second that was low risk with a low payoff. The normatively “rational” choice is the low-risk lottery because it has a higher expected value. The logic here is that rational decision-making relies on a deliberative, controlled system (Kahneman, 2003) and is thus disturbed by states of ego depletion (Masicampo & Baumeister, 2008). If coping with prejudice has lingering effects, then, it should affect people’s ability to make rational decisions, even when the decisions are unrelated to the domain of prejudice. And this is precisely what we found. After vividly recalling instances of prejudice, participants were more likely to choose the high-risk lottery compared to participants in the control group (who recalled their moments of prejudice *after* making the lottery choice) who overwhelmingly chose the low-risk lottery. Coping with threats to social identity—whether they are

threats to one's race, religion, or gender—contributed to poor decision-making, even when the decision was in a prejudice-free domain.

Others have since shown further evidence for the lingering effects of social identity threat. For example, Blair and Steele (2010) have shown that some Black students show spillover effects after witnessing someone else make a racist remark. Specifically, race-identified Black students had difficulty maintaining their attention, as assessed on a Stroop color-naming task, after they heard a racist comment versus a neutral, nonracist comment. Coping with social identity threat, in other words, spilled over to the realm of attentional control. More recently, studies have shown spillover when people cope with the fact that they have relatively less money than those around them (Johnson, Richeson, & Finkel, 2011). Specifically, students of relatively low socioeconomic status had a tougher time regulating their consumption of candy and in maintaining their focus on a Stroop task after coping with a situation where their social identity was threatened.

In sum, stereotype and social identity threat *can* spill over. Self-control, or its failure, is the proximal cause of spillover, and given self-control's prominent role in many spheres of human behavior, it is no surprise that threat can have such a long list of lingering effects. Future research will most certainly add to this list.

### **Policy Implications of the Lingering Effects of Stereotype Threat**

Stereotype threat has lingering effects, hurting people targeted by negative stereotypes and social identities in a broad range of domains. Fortunately, there is much that can be done to eliminate stereotype threat spillover—including individual-based approaches that help targets cope more adaptively with threat and societal-based approaches whose goal is to change norms of behavior and curb stereotyping and prejudice. In this section, we discuss strategies for reducing the occurrence of stereotype and social identity threat, and for minimizing the consequences when it does occur. In the service of this latter goal, we will first discuss what can be done to help individuals manage and potentially overcome the consequences of spillover. We hope to offer feasible suggestions for ways in which resources can be provided to stigmatized individuals, whether it be a Black man at a prestigious university, a White man with an athletics scholarship, a woman in an Engineering program, or a Korean immigrant in an English-speaking environment.

#### *Change from the Target's Perspective*

Thus far, we have documented evidence of a process, stereotype threat spillover, which can help to account for the negative outcomes associated with coping with threats to one's social identity. Across a number of studies, we have shown that coping with negative thoughts and feelings related to stigmatization

can take a toll on what happens to individuals later on—even in seemingly unrelated situations (Inzlicht & Kang, 2010; Inzlicht et al., 2006). In an experimental setting, a single experience of stereotype threat can lead to a single instance of, for example, aggressive behavior. In the life of a stigmatized individual, however, these threatening situations are a chronic reality exacting continuing demands on self-control resources, depleting the ability to resist aggressive impulses on a much larger and much more important scale—day-to-day life. Black college students are not just faced with the difficulty of writing one exam—they must constantly attempt to perform well in situations where their racial identity predicts that they should perform poorly. Critically, unless steps are taken to derail the process of stereotype threat spillover, the minor and major decisions in their lives will often reflect the consequences.

While we are conscious that system-level policy changes would be necessary to truly tackle the problems associated with stereotyping and prejudice—a subject that we will turn to in the next section—we also feel that a focus on individuals can provide a sense of personal control and empowerment. Previous research has shown, for instance, that when people feel that they have the power to effect desirable change in their lives, they have reduced feelings of physiological stress and resignation, show increased coping efforts, and are less likely to fall prey to feelings of helplessness (Bandura, 1977, 1982). In fact, feelings of personal control may constitute a central need in people's lives (Kay, Gaucher, Napier, Callan, & Laurin, 2008). Encouragingly, when individuals feel that they have the ability to promote change, they are more likely to feel that their group is capable of effecting social change through unified action (Fernández-Ballesteros, Díez-Nicolás, Caprara, Barbaranelli, & Bandura, 2002). Thus, strategies that help to fortify the individual against stereotype threat spillover may have the added benefit of encouraging the individual to fight for more far-reaching policy change.

*Shifting appraisals.* At the individual level, the first step in the process of stereotype threat spillover is appraisal; if a person does not perceive a situation as threatening, there will be no stereotype-related thoughts and feelings to contend with, and thus no consequences for performance or self-control. This becomes immediately apparent when we look at one of the key ways that stereotype threat is manipulated in experiments—one group is led to appraise the situation in a threatening way, while another is prompted to appraise it in nonthreatening terms (e.g., Croizet et al., 2004; Inzlicht & Kang, 2010; Spencer et al., 1999). The difference between the two groups is that those in the control group do not feel the need to regulate negative emotions during the task, and thus feel less depleted afterward (Johns et al., 2008). In this way, reappraisal can essentially stop spillover before it starts, circumventing potentially damaging attempts to suppress negative emotions (Gross, 1998, 2002). One approach for minimizing spillover, then, is to help change problematic patterns of appraisal for people who are stigmatized.

We believe that this can be achieved not by putting on blinders to the threats that exist, but by encouraging people to construe situations in ways that they become challenges rather than threats.

From a physiological perspective, there are two key ways that our body can react to a performance situation, whether it is a calculus test or a piano recital: it can act as if it is being challenged, or as if it is being threatened. Compared to challenge, when in a threat state, the heart pumps blood less efficiently and has to push against greater resistance in the arteries and veins (Blascovich & Tomaka, 1996; Mendes & Jamieson, 2011). This physiological pattern has been found to produce deficits in performance and to contribute to negative health outcomes (Blascovich, 2008; Seery, Weisbuch, Hetenyi, & Blascovich, 2010). Fortunately, the way the body reacts to situations is not set in stone, and there are ways that we can tip the scales in favor of a challenge response.

Many of the manipulations that produce classic stereotype threat effects put people in a state of physiological threat as opposed to challenge. For example, telling people that a test is gender biased leads to a threat state among women, but a challenge state among men (Vick, Seery, Blascovich, & Weisbuch, 2008). Similarly, when Blacks are led to believe that a test is culturally biased against them, they are likely to experience threat (Blascovich et al., 2001). Reframing a test as a challenge, however, can buffer against these effects. For example, in one study, half of a group of Black students was told that a test “would be able to measure [their] ability at solving math problems,” while the other half was told that “working on these problems might be a big help in school because it sharpens the mind” (Alter, Aronson, Darley, Rodriguez, & Ruble, 2010, p. 167). This second group performed better than the first, demonstrating that simple changes in framing can influence the way that people perform. Even something as simple as having people focus on potential gains (e.g., grades or money) rather than losses can help shift them to a state of challenge that will maintain their ability to do well (Seery, Weisbuch, & Blascovich, 2009).

These findings offer simple policy suggestions that can bring about real change. If academic institutions—from high schools to universities, but also standardized test centers—adopted the simple policy of framing their tests in terms of gains instead of losses, stereotype threat and stereotype threat spillover can be mitigated. University professors could, for instance, change their essay grading-scheme such that students’ marks improve with each solid argument, rather than decline with each weakness. Another possible approach would be for supervisors to adjust the way that they present tasks to employees, treating them as opportunities to grow and gain new skills, rather than tests of one’s current abilities.

Several other research findings suggest alternative ways in which appraisals can be shifted for the better. One promising finding demonstrated that teaching people about stereotype threat can actually immunize them against its detrimental effects (Johns et al., 2005). Additionally, enforcing positive stereotypes (McGlone &

Aronson, 2006, 2007), focusing on the group's achievements (McIntyre, Paulson, & Lord, 2003), and emphasizing the commonalities between stigmatized and non-stigmatized groups (Rosenthal & Crisp, 2006) can all help to reduce performance deficits caused by feelings of stigmatization. Universities and testing centers could leverage these findings and create a set of standard practices to reduce stereotype threat by simply changing the way tests are framed and, thereby, appraised by test takers.

These same sorts of practices should stem spillover effects as well. To the extent that interventions geared at changing appraisals reduce stereotype threat, they should also reduce the chances that stereotype threat will spill over. For example, we previously discussed work showing that getting people to reappraise the test situation protected them from overeating, becoming aggressive, or losing focus after coping with stereotype threat (Inzlicht & Kang, 2010). Presumably this worked because when people reappraise their environments, they are less likely to be swept away by the full force of their emotions (Gross & Thompson, 2007) and spared the need to regulate and cope, which can be resource-demanding (Johns et al., 2008).

*Coping effectively.* While reappraisal can help to resolve miscommunications and ambiguities, there also needs to be a strategy for situations in which reappraisal is inadequate or impossible; for this, we turn to coping. There are two relevant levels of analysis when discussing coping in the context of stereotype threat spillover: (1) coping with negative thoughts while in a performance situation, and (2) coping with the effects of recurring instances of stereotype threat. We will touch on both of these by addressing ways that mindfulness meditation (Brown & Ryan, 2003) can help to change the way that people deal with negative thoughts.

As discussed previously, stereotype threat causes poor performance because it prompts disruptive negative thoughts and emotions during the relevant task (Cadinu et al., 2005; Croizet et al., 2004; Keller & Dauenheimer, 2003). Spillover, then, occurs because regulating these thoughts and emotions takes a toll on individuals' self-control resources, disrupting the ability to exert control in other domains (Inzlicht & Kang, 2009; Johns et al., 2008; Schmeichel, 2007). One way, then, to stop this process is to reduce the occurrence of ruminative thoughts and negative emotions.

Meditation has begun to show promise in this domain. Scientific interest in meditation and mindfulness has exploded in the last decade. This interest has fuelled study after study demonstrating various positive outcomes of mindfulness meditation, from improved executive control (Jha, Krompinger, & Baime, 2007) to reduced stress (Tang et al., 2007), from improved immune function (Davidson et al., 2003) to better emotion regulation (Brown, Goodman, & Inzlicht, in press). Mindfulness meditation practice, which is becoming more and more common in Western nations, involves cultivating focused attention by sitting



quietly for a few minutes a day and focusing on one solitary thing (e.g., one's own breathing) (Kabat-Zinn, 1994). Mindfulness meditation practice fosters a mind-set that is characterized by two dimensions, present moment awareness (e.g., Brown & Ryan, 2003) and nonjudgmental acceptance of experiences (Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008). As such, many studies have shown that meditators exhibit quelled reactivity to emotional stimuli, including threatening ones (e.g., Brown et al., in press).

In terms of coping with threats to one's social identity, meditation may be of great service. Mindfulness meditation decreases the frequency of negative thoughts and improves the ability to let go of these thoughts when they do occur (Frewen, Evans, Maraj, Dozois, & Partridge, 2008). Positive changes in distractive and ruminative thoughts and behaviors were found even when compared to relaxation techniques (Jain et al., 2007). Perhaps even more promising, a 10-day intensive meditation training course was shown to improve depressive symptoms and rumination and to bolster working memory and attention (Chambers, Lo, & Allen, 2008). Thus, meditation not only reduces distressing thoughts and feelings, but also fortifies the self-control resources that are at risk of being depleted by stereotype threat.

Making meditation training available as a resource in academic or workplace settings could be as simple as introducing meditation training programs, much like the fitness and skills workshops that are often already in existence. For example, universities and workplaces could start offering workshops on mindfulness-based stress reduction, a program funded by the National Institute of Health, and with proven effectiveness (University of Massachusetts Medical School, 2011). As an added benefit, given that ruminative thoughts and depressive symptoms certainly are not specific to those who are stigmatized, these resources could be widely beneficial to anyone who uses them.

In this section, we have outlined theoretically grounded strategies for reducing the undesirable consequences experienced by people who are targets of negative stereotypes. Thus far we have focused on efforts aimed at providing stigmatized individuals with the resources necessary to thrive in environments where destructive stereotypes are a reality. In the long run, however, we hope that this reality can be changed so that stigmatization becomes less and less prevalent. It is to this goal—the goal of reducing stereotype threat spillover at its roots—that we turn to next.

### *Change from Society's Perspective I: Strategies for Reducing Stereotypes*

In the previous sections, we outlined the potential for stereotype and social identity threat to spill over and impact diverse groups of individuals in a wide array of important and ubiquitous domains. Just as the effects of social identity threats cannot be confined to the laboratory, so too must our efforts to reduce these

threats be focused outside of the laboratory, at the broad level of social policy. A crucial first step toward decreasing the impact of identity threats is to decrease threat at its *source*—that is, by reducing negative stereotyping and prejudice. Although stereotyping and prejudice are among the world's most pressing social problems, with consequences ranging from health disparities to genocide and terrorism (e.g., Sternberg, 2003), their management is often handled poorly in social settings and policy (Paluck & Green, 2009). The necessity and demand for practical, theoretically driven, and empirically based stereotype and prejudice reduction programming and policy in all public spheres seems evident.

While stereotypes are generalized beliefs about a social group (e.g., “homeless people are dirty”), prejudice is attitudes and emotions related to those social groups (e.g., “I feel disgusted when a homeless person touches me”). Although stereotypes and prejudice are often intertwined, they are not necessarily correlated (Devine, 1989). Because of this distinction, and because coping with negative stereotypes and coping with prejudice can both spill over, it is important to identify strategies that will help to reduce both stereotyping and prejudice. In what follows, we outline strategies aimed at doing precisely this: reducing the existence of both stereotyped beliefs and prejudiced attitudes.

Claude Steele famously referred to stereotype threat as occurring whenever stereotypes are “in the air” (Steele, 1997). An important goal of policies aimed at reducing stereotype threat spillover, therefore, will be to decrease the existence of negative stereotypes—in effect, to take them out of the air. Stereotypes are well known and widespread, and targets must contend with them repeatedly over the course of a single day. Even children know that “girls are bad at math” (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002) and that some jobs are “for Black people” and others are “for White people” (Bigler, Averhart, & Liben, 2003)—these stereotypes are acquired early and exact a lifetime of consequences. Likewise, interventions aimed at reducing stereotypes should begin early and be repeated across the lifespan and across settings (e.g., at home, at school, in the workplace). We propose three ways in which exposure to negative stereotypes can be decreased: a reduction of stereotypic content in the media, exposure to and interaction with positive role models, and a series of subtle, stereotype-incongruent changes to the environment. Our list is in no way meant to be exhaustive, but we hope to provide some starting points for policy makers interested in applying research findings to the problem of stereotyping—and their attendant lingering effects—within contemporary society.

*Reducing stereotypic content in the media.* Powerful stereotypes, such as those linking women to inferior mathematical ability, wield their influence because they are shared at a cultural level. These cultural stereotypes are communicated widely, often via outlets of mass media (Ashmore, Del Boca, & Wohlers, 1986; Jacobs & Eccles, 1985). One particularly potent medium is television, and researchers have shown that exposure to gender-stereotypic television

commercials disrupt women's performance and aspirations in the mathematical domain (Davies, Spencer, Quinn, & Gerhardstein, 2002). In this study, women exposed to two commercials in which women acted stereotypically (being excited about new cosmetic and baking products) performed worse on a math test compared to men, avoided math items in favor of verbal items on an academic test, and indicated less vocational interest in quantitative compared to verbal domains. These results suggest the need for policy aimed at reducing stereotyped depictions of stigmatized individuals in the mass media, especially media aimed at children. Remember, stereotypes are acquired early, so efforts aimed at reducing children's exposure to stereotyped exemplars is particularly important. In this vein, we also suggest legislation against advertisements that propagate group stereotypes in any public place (e.g., roadside billboards, advertisements on public transit systems). Eradication of stereotyped depiction in mass media is a lofty goal, but even these small steps have the potential to go a long way in creating more identity-safe environments for stereotyped individuals.

*Exposure to positive role models.* Our next suggestion for reducing stereotypes is exposing individuals to positive, counterstereotypic role models. Numerous studies have shown that exposure to a female role model improves women's academic performance (Marx & Roman, 2002), confidence (Reid & Roberts, 2006), and attitudes and aspirations (Nauta, Epperson, & Kahn, 1998). A recent guide produced by the U.S. Department of Education on how to encourage girls in math and science suggests a number of ways that students can be exposed to female role models (Halpern et al., 2007). For example, teachers can be encouraged to assign biographical readings about female scientists, mathematicians, and engineers and to discuss current events which showcase achievements of women in math and science. The report further suggests that female role models who are "attainable," such as an older female student who overcame initial difficulty by working hard and persevering, may be more effective than a gifted female engineer who never had any difficulty with math or science (e.g., Good, Aronson, & Inzlicht, 2003). Recent research on the "Obama Effect" particularly highlights the power of positive in-group role models (Marx, Ko, & Friedman, 2009). Marx and his colleagues found that exposure to Barack Obama's stereotype-defying accomplishments helped Black students overcome the effects of stereotype threat. Exposure to positive role models is useful for both targets and perceivers, in that these positive role models help to break down the connection between a negative stereotype and an associated group.

*Changes to the environment.* The connection between groups and negative stereotypes can be further weakened by making subtle changes to environments in which stereotypes may be particularly salient. For example, not asking students to report their gender or race on academic tests or framing tests as measuring current knowledge or school-based performance rather than overall aptitude or individual

skill could limit the activation of group-based stereotypes in schools (Halpern et al., 2007). We also suggest other subtle changes, such as ensuring that women are equally represented in pictures on the walls of math, science, and engineering buildings and classrooms, or that minority students are equally represented on college admissions brochures and other academic advertisements. Indeed, much of the work of reducing stereotypes will involve breaking the connection between stereotypes and stereotyped group members. All of these suggestions work to weaken this connection and build new connections between these groups and more positive beliefs and expectations and, together, they should form a worthwhile step toward reducing the effects of stereotype and social identity threat, including the lingering effects we have discussed here. In the next section, we discuss interventions aimed at reducing prejudice, the negative attitudes and feelings associated with stereotypes.

### *Change from Society's Perspective II: Strategies for Reducing Prejudice*

Because dealing with prejudice—and not just with stereotypes—can be stressful and ego depleting, they too can have lingering effects after people have left the threatening environment. Thus, policies aimed at reducing prejudice can also be an effective tool in combating spillover.

Although some studies have shown promise toward the reduction of in-group preferences (e.g., Brewer & Gaertner, 2001; Gaertner & Dovidio, 2000) and automatic biases (e.g., Phillips, Kawakami, Tabi, Nadolny, & Inzlicht, 2011), the study of prejudice reduction should be extended significantly to include more direct interventions based on classic psychological findings (Paluck & Green, 2009). In an effort to offer practical strategies for prejudice reduction within a well-established theoretical and empirical groundwork, we next review some recent evidence that advocates a motivation-based approach to egalitarian education and policy.

*Motivation to reduce prejudice.* While the task of changing people's attitudes and beliefs to make them less prejudiced can be difficult, we believe that targeting people's specific motivations to regulate their prejudice can be effective. Essentially, we are proposing that some motivations to be unprejudiced are more effective and long-lasting than others and, specifically, we propose that one key way to reduce prejudice may be to increase the extent to which motivation to reduce prejudice is *self-determined*.

Self-determination refers to the extent to which behavior is autonomous or self-determined (i.e., originating from the self or sincerely self-endorsed), as opposed to being compelled through external pressure or social control (Deci & Ryan, 2002; Ryan & Deci, 2000). For instance, people can be driven by a deep interest in their work, or coaxed by a monetary reward. In terms of prejudice-reduction efforts, some people may be motivated to reduce prejudice because they value diversity and egalitarianism, while others may aim to reduce prejudice because

they fear being labeled a bigot. When one is self-determined to regulate prejudice, nonprejudice is a personally important goal, and may even be an integrated aspect of the self-concept.

The question of whether motivation is internal versus external is important in predicting whether people will be successful in achieving their goals (Grolnick & Ryan, 1987; La Guardia & Patrick, 2008; Pelletier & Sharp, 2008; Williams, Niemiec, Patrick, Ryan, & Deci, 2009). With respect to the present discussion, a growing body of work suggests that people with internalized, self-determined reasons for aiming to be nonprejudiced are better able to curb their racial biases, than those with nonself-determined reasons. More specifically, a self-determined motivation to control prejudice is related to decreases in modern racism (e.g., Legault, Green-Demers, Grant, & Chung, 2007; Plant & Devine, 1998); reduced automatic racial bias (Devine, Plant, Amodio, Harmon-Jones, & Vance, 2002; Legault et al., 2007); the suppression of stereotyping (Legault, Green-Demers, & Eadie, 2009); and attenuation of the effects of intergroup threat/competition on prejudice (Legault & Green-Demers, 2011). Furthermore, self-determined prejudice regulation appears to operate automatically, whereas nonself-determined prejudice regulation depletes self-regulatory strength (Legault et al., 2009), suggesting that self-determined prejudice regulation is more reliable in the face of everyday obstacles, distractions, and lapses in self-control that might otherwise undermine prejudice reduction efforts. Given the advantages of being internally and personally motivated to reduce prejudice, the major question becomes: How can the social context promote it?

*Reducing prejudice by changing motivation.* Our social environment—whether it be the home, workplace, or society at large—can have a profound impact on our motivational intentions and actions (for a review see Deci & Ryan, 2002). When the social context pressures people through the use of external controls (e.g., incentives, rules, and punishments), personal autonomy is undermined, and self-determined motivation diminishes (e.g., Deci, Koestner, & Ryan, 1999). On the other hand, social climates that support the individual's volition and choice have been shown to yield increases in self-determined regulation (e.g., Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004). In the realm of prejudice reduction, these findings suggest that prejudice will decrease when the social context acknowledges the individual's autonomy in choosing egalitarian goals and promotes the personal valuing of egalitarianism. On the other hand, when the social context exerts control over the individual by enforcing social and political standards of acceptable intergroup attitudes and behavior, self-determined prejudice regulation will decrease, and prejudice may even rise.

A recent test of these hypotheses examined the role of the social climate in developing motivation to regulate prejudice (Legault, Gutsell, & Inzlicht, in press). Participants read and provided feedback on a new initiative to reduce prejudice. They were randomly assigned to one of three groups: a condition

designed to support self-determined motivation to be nonprejudiced; a condition designed to control and enforce external motivation to be nonprejudiced; and a neutral no-treatment condition. In the two treatment conditions, participants read a brochure outlining either a diversity (autonomy-support condition) or anti-prejudice (controlling condition) seminar. In the autonomy-support condition, participants were encouraged to examine their own attitudes toward nonprejudice and equality, and the personal importance of nonprejudice was emphasized. In the controlling condition, controlling language aimed at pressuring participants to comply with external standards of nonprejudice was used.

Results demonstrated that those in the autonomy-support of diversity condition displayed significantly less racism than those in the controlling, anti-prejudice condition, as well as those in the control group, an effect that was mediated by increases in self-determined motivation to be nonprejudiced. Interestingly, those who read the controlling brochure demonstrated significantly more racism than those in the neutral condition, suggesting that enforcing external policies without rationale can be worse for prejudice reduction than doing nothing at all.

Importantly, policy makers in government and universities can take steps to reduce prejudice by using interventions that target people's autonomous motivations to be nonprejudiced. Right now, this is not happening, with many programs trying to reduce prejudice by invoking the notion that prejudice should be battled against or eliminated. To name only a few, the Partners Against Hate project promotes the fight against hate violence, outlining various ways to combat prejudice; Tolerance-dot-org is an organization devoted to combating racial bias and the Government of Canada's Citizenship and Immigration Department currently espouses a "Racism: Stop it!" campaign in numerous schools throughout the country, calling for the elimination of racial discrimination and displaying symbols that summon the "stamping-out" of prejudice. The work we have outlined here casts doubt regarding the effectiveness of these prejudice reduction practices, and in fact suggests that they may actually increase prejudice. Instead, this work suggests that prejudice reduction will only happen when prejudice-reduction practices can foster self-determined motivation.

These findings provide a solid foundation for clear prejudice-reduction tactics that can stop stereotype and social identity threat spillover at its root. When perceivers hold fewer stereotypes and are less prejudiced, targets will have to cope less often with negative images and expectations about their group, leaving them with more intact self-regulatory resources.

## Conclusion

Stereotype threat research has come a long way since the original Steele and Aronson paper. Since then, we have learned much about the power of stereotype

threat—observing its potential to impact a variety of stigmatized groups in a number of important life domains. Our understanding of the mechanisms underlying stereotype threat has also evolved, with much current research still aimed at digging deeper and deeper to truly understand what brings about the now classic effects associated with this phenomenon. We have contributed to this understanding by presenting new evidence of stereotype threat spillover, the process through which stereotypes and prejudices can have lingering consequences in the day-to-day lives of stigmatized individuals. Although these findings are alarming, it has not been our goal to deliver a message of dread. Instead, we hope that this illumination of the far-reaching effects of stereotype and social identity threat will highlight the urgent need to do something to stop it, and the relative ease with which this can be done.

We have presented a number of theoretically driven suggestions for reducing the impact of stereotype threat, both at the level of the individual and at the level of society, which essentially build on social systems already in place. None of our suggestions require sweeping organizational or structural changes, so we challenge policy makers to begin testing and implementing these suggestions without delay. Now that we as social scientists are beginning to grasp the potency of stereotype ad threat, it behooves us to communicate our findings quickly and clearly to those with the power to make the changes necessary to reduce it. We have already seen evidence suggesting that stereotype and social identity threat may, even if only in small part, contribute to important and costly social problems such as overeating, obesity, violence, and risky decision-making. If we might be able to reduce these problems via simple suggestions to appraise and cope with situations differently, by eliminating stereotyped caricatures of women in the media, or by encouraging a more self-determined motivation to reduce prejudice, it will certainly have been worth our effort.

## References

- Allison, K. W. (1998). Stress and oppressed social category membership. In J. K. Swim & C. Stangor (Eds.), *Prejudice: The target's perspective* (pp. 145–170). San Diego, CA: Academic Press.
- Alter, A. L., Aronson, J., Darley, J. M., Rodriguez, C., & Ruble, D. N. (2010). Rising to the threat: Reducing stereotype threat by reframing the threat as a challenge. *Journal of Experimental Social Psychology, 46*, 166–171.
- Aronson, J., & Inzlicht, M. (2004). The ups and downs of attributional ambiguity: Stereotype vulnerability and the academic self-knowledge of African American college students. *Psychological Science, 15*, 829–836.
- Ashmore, R. D., Del Boca, F. K., & Wohlens, A. J. (1986). Gender stereotypes. In R. D. Ashmore & F. K. Del Boca (Eds.), *The social psychology of female-male relations* (pp. 69–119). New York: Academic Press.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191–215.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37*, 122–147.

- Bartholow, B. D., Pearson, M. A., Dickter, C. L., Sher, K. J., Fabiani, M., & Gratton, G. (2005). Strategic control and medial frontal negativity: Beyond errors and response conflict. *Psychophysiology*, *42*, 33–42.
- Baumeister, R. F., & Heatherton, T. F. (1996). Self-regulation failure: An overview. *Psychological Inquiry*, *7*, 1–15.
- Baumeister, R. F., Heatherton, T. F., & Tice, D. M. (1994). *Losing control: How and why people fail at self-regulation*. San Diego, CA: Academic Press.
- Beilock, S. L., Ryell, R. J., & McConnell, A. R. (2007). Stereotype threat and working memory: Mechanisms, alleviation, and spillover. *Journal of Experimental Psychology: General*, *136*, 256–276.
- Ben-Zeev, T., Fein, S., & Inzlicht, M. (2005). Stereotype threat and arousal. *Journal of Experimental Social Psychology*, *41*, 174–181.
- Bigler, R. S., Averhart, C. J., & Liben, L. S. (2003). Race and the workforce: Occupational status, aspirations, and stereotyping among African American children. *Developmental Psychology*, *39*, 572–580.
- Blair, A. N., & Steele, J. R. (2010). Examining the consequences of exposure to racism for the executive functioning of Black students. *Journal of Experimental Social Psychology*, *46*, 127–132.
- Blascovich, J. (2008). Challenge, threat, and health. In J. Y. Shah & W. L. Gardner (Eds.), *Handbook of motivation science* (pp. 481–493). New York: Guilford Press.
- Blascovich, J., Spencer, S. J., Quinn, D., & Steele, C. (2001). African Americans and high blood pressure: The role of stereotype threat. *Psychological Science*, *12*, 225–229.
- Blascovich, J., & Tomaka, J. (1996). The biopsychosocial model of arousal regulation. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 28, pp. 1–51). New York: Academic Press.
- Brewer, M. B., & Gaertner, S. L. (2001). Strategies for reducing intergroup bias. In R. J. Brown & S. L. Gaertner (Eds.), *Handbook of social psychology: Intergroup processes*. Oxford: Blackwell Science.
- Brown, K. W., Goodman, R., & Inzlicht, M. (in press). Dispositional mindfulness and the attenuation of neural responses to emotional stimuli. *Social Cognitive Affective Neuroscience*.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, *84*, 822–848.
- Bushman, B. J., & Baumeister, R. F. (1998). Threatened egotism, narcissism, self-esteem, and direct and displaced aggression: How self-love or self-hate lead to violence. *Journal of Personality and Social Psychology*, *75*, 219–229.
- Cadinu, M., Maass, A., Rosabianca, A., & Kiesner, J. (2005). Why do women underperform under stereotype threat? Evidence for the role of negative thinking. *Psychological Science*, *16*, 572–578.
- Cardaciotto, L., Herbert, J. D., Forman, E. M., Moitra, E., & Farrow, V. (2008). The assessment of present-moment awareness and acceptance: The Philadelphia mindfulness scale. *Assessment*, *15*, 204–223.
- Chambers, R., Lo, B. C. Y., & Allen, N. B. (2008). The impact of intensive mindfulness training on attentional control, cognitive style, and affect. *Cognitive Therapy and Research*, *32*, 303–322.
- Chambliss, W. J. (1994). Policing the ghetto underclass: The politics of law and law enforcement. *Social Problems*, *41*, 177–194.
- Clark, R., Anderson, N. B., Clark, V. R., & Williams, D. R. (1999). Racism as a stressor for African Americans: A biopsychosocial model. *American Psychologist*, *54*, 805–816.
- College Board. (2010). 2010 SAT trends. Retrieved October 17, 2011 at: <http://professionals.collegeboard.com/data-reports-research/sat/cb-seniors-2010/tables>
- Croizet, J.-C., Després, G., Gauzins, M.-E., Huguet, P., Leyens, J.-P., & Méot, A. (2004). Stereotype threat undermines intellectual performance by triggering a disruptive mental load. *Personality and Social Psychology Bulletin*, *30*, 721–731.
- Croizet, J. C., & Millet, M. (2011). Social class and test performance: From stereotype threat to symbolic violence and vice versa. In M. Inzlicht & T. Schmader (Eds.), *Stereotype threat: Theory, process, and application*. New York: Oxford University Press.



- Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., et al. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine*, *65*, 564–570.
- Davies, P. G., Spencer, S. J., Quinn, D. M., & Gerhardtstein, R. (2002). Consuming images: How television commercials that elicit stereotype threat can restrain women academically and professionally. *Personality and Social Psychology Bulletin*, *28*, 1615–1628.
- Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, *25*, 627–668.
- Deci, E. L., & Ryan, R. M. (2002). *Handbook of self-determination research*. Rochester, NY: University of Rochester Press.
- Derks, B., Inzlicht, M., & Kang, S. K. (2008). The neuroscience of stigma and stereotype threat. *Group Processes and Intergroup Relations*, *11*, 163–181.
- Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology*, *56*, 5–18.
- Devine, P. G., Plant, E. A., Amodio, D. M., Harmon-Jones, E., & Vance, S. L. (2002). The regulation of explicit and implicit race bias: The role of motivations to respond without prejudice. *Journal of Personality and Social Psychology*, *82*, 835–848.
- Dion, K. L. (2002). The social psychology of perceived prejudice and discrimination. *Canadian Psychology*, *43*, 1–10.
- Fernández-Ballesteros, R., Díez-Nicolás, J., Caprara, G. V., Barbaranelli, C., & Bandura, A. (2002). Determinants and structural relation of personal efficacy to collective efficacy. *Applied Psychology: An International Review*, *51*, 107–125.
- Frewen, P. A., Evans, E. M., Maraj, N., Dozois, D. J. A., & Partridge, K. (2008). Letting go: Mindfulness and negative automatic thinking. *Cognitive Therapy and Research*, *32*, 758–774.
- Gaertner, S. L., & Dovidio, J. F. (2000). *Reducing intergroup bias: The common ingroup identity model*. Philadelphia, PA: Psychology Press.
- Gailliot, M. T., Baumeister, R. F., Dewall, C. N., Maner, J. K., Ashby, P. E., Tice, D. M., et al. (2007). Self-control relies on glucose as a limited energy source: Willpower is more than a metaphor. *Journal of Personality and Social Psychology*, *92*, 325–336.
- Good, C., Aronson, J., & Inzlicht, M. (2003). Improving adolescents' standardized test performance: An intervention to reduce the effects of stereotype threat. *Journal of Applied Developmental Psychology*, *24*, 645–662.
- Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime*. Palo Alto, CA: Stanford University Press.
- Grolnick, W. S., & Ryan, R. M. (1987). Autonomy in children's learning: An experimental and individual difference investigation. *Journal of Personality and Social Psychology*, *52*, 890–898.
- Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology*, *74*, 224–237.
- Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology*, *39*, 281–291.
- Gross, J. J., & Thompson, R. A. (2007). Emotion regulation: Conceptual foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 3–24). New York: Guilford Press.
- Gutsell, J. N., & Inzlicht, M. (2010). Ego depletion affects basic (negative) emotions. Unpublished manuscript. University of Toronto.
- Hagger, M. S., Wood, C., Stiff, C., & Chatzisarantis, N. L. D. (2010). Ego depletion and the strength model of self-control: A meta-analysis. *Psychological Bulletin*, *136*, 495–525.
- Halpern, D., Aronson, J., Reimer, N., Simpkins, S., Star, J., & Wentzel, K. (2007). *Encouraging girls in math and science* (NCER 2007–2003). Washington, DC: National Center for Education Research, Institute of Education Sciences, U.S. Department of Education. Retrieved October 17, 2011 at: <http://ncer.ed.gov>.
- Hawkins, D. F., Laub, J. H., & Lauritsen, J. L. (1998). Race, ethnicity, and serious juvenile offending. In R. Loeber & D. P. Farrington (Eds.), *Serious and violent juvenile offenders: Risk factors and successful interventions* (pp. 30–46). Thousand Oaks, CA: Sage Publications.

- Inzlicht, M., Aronson, J., Good, C., & McKay, L. (2006). A particular resiliency to threatening environments. *Journal of Experimental Social Psychology, 42*, 323–336.
- Inzlicht, M., Aronson, J., & Mendoza-Denton, R. (2009). On being the target of prejudice: Educational implications. In F. Butera & J. Levine (Eds.) *Coping with minority status: Responses to exclusion and inclusion* (pp. 13–36). Cambridge, UK: Cambridge University Press.
- Inzlicht, M., & Ben-Zeev, T. (2000). A threatening intellectual environment: Why females are susceptible to experiencing problem-solving deficits in the presence of males. *Psychological Science, 11*, 365–371.
- Inzlicht, M., & Good, C. (2006). How environments threaten academic performance, self-knowledge, and sense of belonging. In S. Levin & C. van Laar (Eds.), *Stigma and group inequality: Social psychological approaches* (pp. 129–150). Mahwah, NJ: Erlbaum.
- Inzlicht, M., & Gutsell, J. N. (2007). Running on empty: Neural signals for self-control failure. *Psychological Science, 18*, 933–937.
- Inzlicht, M., & Hickman, L. (2004). Stereotype threat affects persistence in non-stereotyped domains. Unpublished manuscript. Wilfrid Laurier University.
- Inzlicht, M. & Kang, S. K. (2010). Stereotype threat spillover: How stereotypes affect eating, decision-making, aggression, and attention. *Journal of Personality and Social Psychology, 99*, 467–481.
- Inzlicht, M., McKay, L., & Aronson, J. (2006). Stigma as ego-depletion: How being the target of affects self-control. *Psychological Science, 17*, 262–269.
- Inzlicht, M., & Schmader, T. (2011). Stereotype threat: Theory, process, and application. New York: Oxford University Press.
- Inzlicht, M., Tullett, A., & Gutsell, J. N. (2011). Stereotype threat spillover. In M. Inzlicht & T. Schmader (Eds.). *Stereotype threat: Theory, process, and application*. New York: Oxford University Press.
- Jacobs, J. E., & Eccles, J. S. (1985). Gender differences in math ability: The impact of media reports on parents. *Educational Researcher, 14*, 20–25.
- Jacobs, J. E., Lanza, S., Osgood, D. W., Eccles, J. S., & Wigfield, A. (2002). Changes in children's self-competence and values: Gender and domain differences across grades one through twelve. *Child Development, 73*, 509–527.
- Jain, S., Shapiro, S. L., Swanick, S., Roesch, S. C., Mills, P. J., Bell, I., et al. (2007). A randomized controlled trial of mindfulness meditation versus relaxation training: Effects on distress, positive states of mind, rumination, and distraction. *Annals of Behavioral Medicine, 33*, 11–21.
- Jamieson, J. P., & Harkins, S. G. (2007). Mere effort and stereotype threat performance effects. *Journal of Personality and Social Psychology, 93*, 544–564.
- Jha, A. P., Krompinger, J., & Baime, M. J. (2007). Mindfulness training modifies subsystems of attention. *Cognitive Affective and Behavioral Neuroscience, 7*, 109–119.
- Johns, M., Inzlicht, M., & Schmader, T. (2008). Stereotype threat and executive resource depletion: Examining the influence of emotion regulation. *Journal of Experimental Psychology: General, 137*, 691–705.
- Johns, M., Schmader, T. & Martens, A. (2005). Knowing is half the battle: Teaching stereotype threat as a means of improving women's math performance. *Psychological Science, 16*, 175–179.
- Johnson, S. E., Richeson, J. A., & Finkel, E. J. (2011). Middle class and marginal? Socioeconomic status, stigma, and self-regulation at an elite university. *Journal of Personality and Social Psychology, 100*, 838–852.
- Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist, 58*, 697–720.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York: Hyperion.
- Kang, S. K., & Inzlicht, M. (2010). Stigma consciousness predicts obesity. Manuscript in Preparation. University of Toronto.
- Kay, A. C., Gaucher, D., Napier, J. L., Callan, M. J., & Laurin, K. (2008). God and the government: Testing a compensatory control mechanism for the support of external systems. *Journal of Personality and Social Psychology, 95*, 18–35.

- Keller, J. & Dauenheimer, D. (2003). Stereotype threat in the classroom: Dejection mediates the disrupting threat effect on women's math performance. *Personality and Social Psychology Bulletin*, *29*, 371–381.
- Krendl, A. C., Richeson, J. A., Kelley, W. M., & Heatherton, T. F. (2008). The negative consequences of threat: A functional magnetic resonance imaging investigation of the neural mechanisms underlying women's underperformance in math. *Psychological Science*, *19*, 168–175.
- Krivo, L. J., & Peterson, R. D. (1996). Extremely disadvantaged neighborhoods and urban crime. *Social Forces*, *75*, 619–648.
- Kurzban, R. (2010). Does the brain consume additional glucose during self-control tasks? *Evolutionary Psychology*, *8*, 244–259.
- La Guardia, J. G., & Patrick, H. (2008). Self-determination theory as a fundamental theory of close relationships. *Canadian Psychology*, *49*, 201–209.
- Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality*, *13*, 141–169.
- Legault, L., & Green-Demers, I. (in press). The protective role of self-determined prejudice regulation on the relationship between intergroup threat and prejudice. *Motivation and Emotion*.
- Legault, L., & Green-Demers, I. (2011). The protective role of self-determined prejudice regulation in the relationship between intergroup threat and prejudice. *Motivation and Emotion*. DOI: 10.1007/s11031-011-9242-9
- Legault, L., Green-Demers, I., Grant, P., & Chung, J. (2007). On the self-regulation of implicit and explicit prejudice: A self-determination perspective. *Personality and Social Psychology Bulletin*, *33*, 732–749.
- Legault, L., Gutsell, J. N., & Inzlicht, M. (in press). Ironic effects of anti-prejudice messages: How motivational intervention can reduce (but also increase) prejudice. *Psychological Science*.
- Levels, M., & Dronkers, J. (2008). Educational performance of native and immigrant children from various countries of origin. *Ethnic and Racial Studies*, *31*, 1404–1425.
- Logel, C., Iserman, E. C., Davies, P. G., Quinn, D. M., & Spencer, S. J. (2009). The perils of double consciousness: The role of thought suppression in stereotype threat. *Journal of Experimental Social Psychology*, *45*, 299–312.
- Major, B., & O'Brien, L. T. (2005). The social psychology of stigma. *Annual Review of Psychology*, *56*, 393–421.
- Marx, D. M., Ko, S. J., & Friedman, R. A. (2009). The “Obama Effect”: How a salient role model reduces race-based performance differences. *Journal of Experimental Social Psychology*, *45*, 953–956.
- Marx, D. M., & Roman, J. S. (2002). Female role models: Protecting women's math test performance. *Personality and Social Psychology Bulletin*, *28*, 1183–1193.
- Masicampo, E. J., & Baumeister, R. F. (2008). Toward a physiology of dual-process reasoning and judgment: Lemonade, willpower, and expensive rule-based analysis. *Psychological Science*, *19*, 255–260.
- McGlone, M. S., & Aronson, J. (2006). Stereotype threat, identity salience, and spatial reasoning. *Journal of Applied Developmental Psychology*, *27*, 486–493.
- McGlone, M. S., & Aronson, J. (2007). Forewarning and forearmng stereotype-threatened students. *Communication Education*, *56*, 119–133.
- McIntyre, R. B., Paulson, R. M., & Lord, C. G. (2003). Alleviating women's mathematics stereotype threat through salience of group achievements. *Journal of Experimental Social Psychology*, *39*, 83–90.
- Mendes, W. B., & Jamieson, J. (2011). Embodied stereotype threat: Exploring brain and body mechanisms underlying performance impairments. In M. Inzlicht & T. Schmader (Eds.), *Stereotype threat: Theory, process, and application*. New York: Oxford University Press.
- Mendoza-Denton, R., Purdie, V., Downey, G., & Davis, A. (2002). Sensitivity to status-based rejection: Implications for African-American students' college experience. *Journal of Personality and Social Psychology*, *83*, 896–918.
- Miller, C. T., & Kaiser, C. R. (2001). A theoretical perspective on coping with stigma. *Journal of Social Issues*, *57*, 73–92.

- Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex "frontal lobe" tasks: A latent variable analysis. *Cognitive Psychology, 41*, 49–100.
- Mokdad, A. H., Serdula, M. K., Dietz, W. H., Bowman, B. A., Marks, J. S., & Koplan, J. P. (1999). The spread of the obesity epidemic in the United States, 1991–1998. *Journal of the American Medical Association, 282*, 1519–1522.
- Morenoff, J. (2005). Racial and ethnic disparities in crime and delinquency in the U.S. In M. Tienda & M. Rutter (Eds.), *Ethnicity and causal mechanisms* (pp. 139–173). New York: Cambridge University Press.
- Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126*, 247–259.
- Muraven, M., & Slessareva, E. (2003). Mechanisms of self-control failure: Motivation and limited resources. *Personality and Social Psychology Bulletin, 29*, 894–90.
- Muraven, M., Tice, D. M., & Baumeister, R. F. (1998). Self-control as a limited resource: Regulatory depletion patterns. *Journal of Personality and Social Psychology, 74*, 774–789.
- National Assessment of Educational Progress. (2009). Nation's report card. Retrieved October 17, 2011 at: [http://nationsreportcard.gov/lit\\_2008/lit0004.asp](http://nationsreportcard.gov/lit_2008/lit0004.asp)
- Nauta, M. M., Epperson, D. L., & Kahn, J. H. (1998). A multiple-groups analysis of predictors of higher level career aspirations among women in mathematics, science, and engineering majors. *Journal of Counseling Psychology, 45*, 483–496.
- Nguyen, H.-H. D., & Ryan, A. M. (2008). Does stereotype threat affect test performance of minorities and women? A meta-analysis of experimental evidence. *Journal of Applied Psychology, 93*, 1314–1334.
- Pajares, F., & Valiante, G. (2006). Students' self-efficacy in their self-regulated learning strategies: A developmental perspective. *Psychologia: An International Journal of Psychology in the Orient, 45*, 211–221.
- Paluck, E. L., & Green, D. P. (2009). Prejudice reduction: What works? A review and assessment of research and practice. *Annual Review of Psychology, 60*, 339–367.
- Pascoe, E. A., & Richman, L. S. (2009). Perceived discrimination and health: A meta-analytic review. *Psychological Bulletin, 135*, 531–554.
- Pelletier, L. G., & Sharp, E. (2008). Persuasive communication and proenvironmental behaviours: How message tailoring and message framing can improve the integration of behaviours through self-determined motivation. *Canadian Psychology, 49*, 210–217.
- Phills, C. E., Kawakami, K., Tabi, E., Nadolny, D., & Inzlicht, M. (2011). Mind the gap: Increasing associations between the self and Blacks with approach behaviors. *Journal of Personality and Social Psychology, 100*, 197–210.
- Plant, E. A., & Devine, P. G. (1998). Internal and external motivation to respond without prejudice. *Journal of Personality and Social Psychology, 75*, 811–832.
- Reid, P. T., & Roberts, S. K. (2006). Gaining options: A mathematics program for potentially at risk adolescent girls. *Merrill-Palmer Quarterly, 52*, 288–304.
- Richards, J. M., & Gross, J. J. (2000). Emotion regulation and memory: The cognitive costs of keeping one's cool. *Journal of Personality and Social Psychology, 79*, 410–424.
- Robinson, M. D., Schmeichel, B. J., & Inzlicht, M. (2010). A cognitive control perspective of self-control strength and its depletion. *Social and Personality Psychology Compass, 4*, 189–200.
- Rosenthal, H. E. S., & Crisp, R. J. (2006). Reducing stereotype threat by blurring intergroup boundaries. *Personality and Social Psychology Bulletin, 32*, 501–511.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68–78.
- Sampson, R. J., & Wilson, W. J. (1995). Toward a theory of race, crime, and urban inequality. In J. Hagan & R. Peterson (Eds.), *Crime and inequality*. Stanford, CA: Stanford University Press.
- Schmader, T., & Johns, M. (2003). Converging evidence that stereotype threat reduces working memory capacity. *Journal of Personality and Social Psychology, 85*, 440–452.
- Schmader, T., Johns, M., & Forbes, C. (2008). An integrated process model of stereotype threat effects on performance. *Psychological Review, 115*, 336–356.

- Schmeichel, B. J. (2007). Attention control, memory updating, and emotion regulation temporarily reduce the capacity for executive control. *Journal of Experimental Psychology: General, 136*, 241–255.
- Schmeichel, B. J., Harmon-Jones, C., & Harmon-Jones, E. (2010). Exercising self-control increases approach motivation. *Journal of Personality and Social Psychology, 99*, 162–173.
- Schmeichel, B. J., Vohs, K. D., & Baumeister, R. F. (2003). Ego depletion and intelligent performance: Role of the self in logical reasoning and other information processing. *Journal of Personality and Social Psychology, 85*, 33–46.
- Seery, M. D., Weisbuch, M., & Blascovich, J. (2009). Something to gain, something to lose: The cardiovascular consequences of outcome framing. *International Journal of Psychophysiology, 73*, 308–312.
- Seery, M. D., Weisbuch, M., Hetenyi, M. A., & Blascovich, J. (2010). Cardiovascular measures independently predict performance in a university course. *Psychophysiology, 47*, 535–539.
- 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. (2010). *Whistling Vivaldi: And other clues to how stereotypes affect us*. New York: W. W. Norton & Company.
- 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.
- Steele, C. M., Spencer, S. J., & Aronson, J. (2002). Contending with group image: The psychology of stereotype and social identity threat. *Advances in Experimental Social Psychology, 34*, 379–440.
- Sternberg, R. J. (2003). A duplex theory of hate: Development and application to terrorism massacres and genocide. *Review of General Psychology, 73*, 299–328.
- Stucke, T. S., & Baumeister, R. F. (2006). Ego depletion and aggressive behavior: Is the inhibition of aggression a limited resource? *European Journal of Social Psychology, 36*, 1–13.
- Tang, Y., Ma, Y., Wang, J., Fan, Y., Feng, S., Lu, Q., et al. (2007). Short-term meditation training improves attention and self-regulation. *Proceedings of the National Academy of Sciences, 104*, 17152–17156.
- Tajfel, H., & Turner, J. C. (1986). The social identity theory of inter-group behavior. In S. Worchel & L. W. Austin (Eds.), *Psychology of intergroup relations*. Chicago: Nelson-Hall.
- Tullett, A. M., & Inzlicht, M. (2010). The voice of self-control: Blocking the inner voice increases impulsive responding. *Acta Psychologica, 135*, 252–256.
- University of Massachusetts Medical School. (2011). Center for Mindfulness, in Medicine, Health Care, and Society. Retrieved October 17, 2011 at: <http://www.umassmed.edu/cfm/stress/index.aspx>
- Vansteenkiste, M., Simons, J., Lens, W., Sheldon, K. M., & Deci, E. L. (2004). Motivating learning, performance, and persistence: The synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *Journal of Personality and Social Psychology, 87*, 246–260.
- Vick, S. B., Seery, M. D., Blascovich, J., & Weisbuch, M. (2008). The effect of gender stereotype activation on challenge and threat motivational states. *Journal of Experimental Social Psychology, 44*, 624–630.
- Vohs, K. D., & Heatherton, T. F. (2000). Self-regulatory failure: A resource-depletion approach. *Psychological Science, 11*, 249–254.
- Walton, G. M., & Cohen, G. L. (2003). Stereotype lift. *Journal of Experimental Social Psychology, 39*, 456–467.
- Wegner, D. M. (1994). Ironic processes of mental control. *Psychological Review, 101*, 34–52.
- Williams, G. C., Niemic, C. P., Patrick, H., Ryan, R. M., & Deci, E. L. (2009). The importance of supporting autonomy and perceived competence in facilitating long-term tobacco abstinence. *Annals of Behavioral Medicine, 37*, 315–324.
- Wraga, M., Helt, M., Jacobs, E., & Sullivan, K. (2007). Neural basis of stereotype-induced shifts in women's mental rotation performance. *Social Cognitive Affective Neuroscience, 2*, 12–19.

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