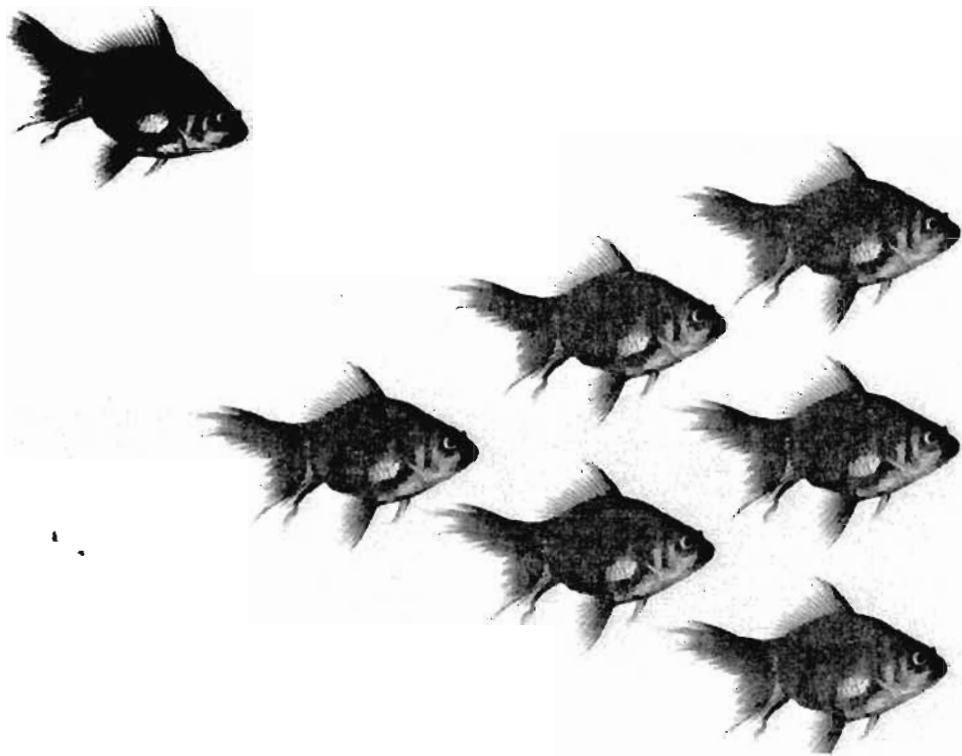


STEREOTYPE THREAT

THEORY, PROCESS, AND APPLICATION



**EDITED BY
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OXFORD

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An Identity Threat Perspective on Intervention

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Kurt Lewin, the renowned experimental social psychologist, said that understanding the processes underlying a problem can help us to remedy it. He also said that one of the best ways to understand a phenomenon is by trying to change it. This chapter discusses how an understanding of “identity threat”—the psychological threat arising from possible devaluation of one’s group—led to successful interventions that closed the achievement gap in schools, a pervasive social problem in the United States. The interventions include invoking high performance standards, encouraging optimistic interpretations of adversity, and buttressing students’ sense of self-integrity and belonging. All the interventions were tested using randomized field experiments that assessed outcomes over long periods of time, sometimes years. Not only did the interventions lead to positive academic trajectories for ethnic minority students in general and female students in science, they also advanced a theoretical understanding of how identity threat compounds over time through recursive feedback loops. Because of the self-reinforcing nature of recursive cycles, subtle but well-timed interventions can have effects that appear disproportionate to their size and duration. Additionally, the research shows how making the jump from lab to field—from theory to application—can bring to light new theoretical principles related to psychological processes and intervention itself.

Keywords: Stereotype threat, academic performance, black–white test score gap, male–female science gap, intervention, affirmation

Across a variety of times and places people have faced negative stereotypes about their group’s ability and belonging in society. Because they know that members of their group have faced prejudice and discrimination, and because they may have experienced these themselves, they may worry they could be judged or treated stereotypically (Steele, Spencer, & Aronson, 2002). This concern is understandable. It can be costly to trust someone who could later prove untrustworthy (Cohen & Steele, 2002). The emotional, psychological, and pragmatic costs of committing oneself to an endeavor or relationship, assuming fair treatment only to find otherwise, can be doubly troubling. Not only is there the loss of time and energy, but

there is also the feeling of having been taken in. For this reason, in school and work settings in the United States, ethnic minorities may entertain the hypothesis that they could be stereotyped until they are provided with evidence to the contrary. Women in math and science may experience similar concerns (Davies, Spencer, Quinn, & Gerhardtstein, 2002).

However adaptive and reasonable this response can be, it can prove costly. As other chapters in this volume attest, the concern that one may be viewed through the lens of a stereotype—stereotype threat—can raise stress, deplete mental resources, and undermine performance (Steele et al., 2002; see also Beilock, Rydell, & McConnell, 2007; Inzlicht, Tullett, & Gutsell, 2011, Chapter 7, this volume; Schmader, Johns, & Forbes, 2008). It can erode people's sense of comfort, belonging, and trust (Cohen & Steele, 2002; Steele et al., 2002; Walton & Carr, 2011, Chapter 6, this volume; Walton & Cohen, 2007), as well as lower their career aspirations (Davies et al., 2002). Structural factors are often seen as the source of inequality. However, inequality can also arise from differences in people's perceptions, their subjective construals (Ross & Nisbett, 1991). Groups may differ in their subjective construals at school or work because of real historical antecedents. But such construals can reinforce objective inequalities. When members of a group underperform because they perceive that they could be stereotyped, their educational, economic, and career opportunities diminish. Because inequality has psychological as well as structural causes, psychological interventions need to be considered along with structural approaches (Nisbett, 2009).

Research on stereotype threat has shown that it can occur regardless of the objective prejudice in an environment. The mere possibility that one could be seen negatively can prove threatening. All of us belong to groups that, in one setting or another, can cast us as outsiders. When we care about succeeding in the setting, the sense of being seen as an outsider can be debilitating. As research on stereotype threat demonstrates, such concerns can arise from widely known negative stereotypes about our groups (Steele et al., 2002). A white basketball player may worry about confirming, in the minds of others, the "white men can't jump" stereotype to such an extent that it undermines his or her vertical leap performance (Garcia, 2002). Likewise African Americans and Latino Americans at school or work, and women in math and science, may underperform because of the stress arising from possibly confirming a negative stereotype about their ethnic or gender group (Davies et al., 2002; Steele & Aronson, 1995).

Stereotype threat is an example of the general phenomenon of identity threat (Branscombe, Schmitt, & Harvey, 1999; Steele et al., 2002). *Social identity threat*, the group form of this threat, arises when people realize that they could be devalued on the basis of their group for any reason. Because the threat is directed at one's group, one need not experience it personally. For instance, African Americans and women felt threatened—displaying lower self-esteem and worse performance—when they thought that someone *else* in their group could perform poorly and thus lend credence to the stereotype (Cohen & Garcia, 2005). Like any psychological stressor, identity threat can depress cognitive functioning and emotional well-being,

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especially when chronic and experienced in a domain, like school or work, where outcomes have material and symbolic consequences.

■ MOVING FROM LAB TO FIELD: CONCEPTUALIZING IDENTITY THREAT IN REAL-WORLD SETTINGS

Laboratory research suggests several effective steps for reducing stereotype threat. Among these are exposing students to role models who disconfirm the stereotype through their competence (Marx & Roman, 2002), encouraging people to see performance gaps between groups as due to social rather than genetic factors (Dar-Nimrod & Heine, 2006), and having people call to mind an alternative, positively stereotyped identity they hold, such as “high-achieving college student” (Rydell, McConnell, & Beilock, 2009). A structural strategy to reduce stereotype threat is to ensure adequate representation of the stereotyped group in the classroom or workplace (Inzlicht & Ben-Zeev, 2000). The picture of stereotype threat emerging from these studies is of a process that is powerful but malleable. Although stereotype threat causes dramatic decrements in performance, small changes in the laboratory can free people of its effects. Clearly, it is possible to manipulate a person’s subjective construal in the lab for the better. Such laboratory research, moreover, proved critical in the development of social-psychological interventions that closed achievement gaps in schools. However, in the field, unlike the lab, a blizzard of competing cues could offset the effect of any positive intervention. A solid understanding of how identity threat and intervention processes play out over time and interact with other factors in social environments is needed.

Figure 18.1 presents a model of the way in which psychological threats, including identity threat, affect performance (Cohen & Garcia, 2008). Threat acts as a restraining force (Lewin, 1951). It prevents positive forces in both the person and the environment from asserting their full impact on performance and learning. A student may have the ability to excel, but stereotype threat may prevent the expression of

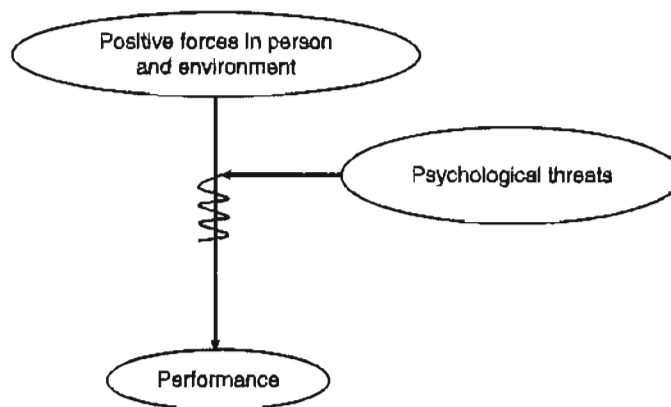


Figure 18.1 The interplay of psychological threat with other forces.

that ability, as when a skilled athlete chokes under pressure. Likewise, opportunities for learning may present themselves, but an intimidated student may fail to take advantage of them. Threat may also make negative factors gain a larger role in outcomes. For example, poor performance due to stereotype threat can make it more likely that a student will be assigned to remediation or held back in grade. Just as drag can prevent a car from achieving its top speed and efficiency, psychological forces can limit the efficiency of the school system. Effective social psychological interventions lessen threat, and thereby enable the positive forces to assert their impact more fully and help constrain forces that could have a negative impact.

Rather than being mutually exclusive, psychological and structural approaches are thus complementary (Garcia & Cohen, in press). Although both are necessary for optimal performance, neither is sufficient. For example, one popular psychological intervention is that of *attributional retraining* (Wilson, Damiani, & Shelton, 2002; see also Good, Aronson, & Inzlicht, 2003; Walton & Cohen, 2007). Students are taught to attribute setbacks to factors unrelated to the stereotype or a lack of belonging. Instead, they are encouraged to attribute them to common challenges inherent in school. Such interventions can dramatically improve performance (see Wilson et al., 2002). But they can prove ineffective and even counterproductive when unaccompanied by objective opportunities for growth. For instance, attributional retraining paired with poor instruction produced no improvement in performance for students with a history of failure. But when paired with high-quality instruction, it produced a level of performance on par with that of their peers without a history of failure (Menec, Perry, Struthers, Schonwetter, Hechter, & Eichholz, 1994).

One line of research explored the interaction between psychological and structural factors in a key educational situation—the feedback interaction between teacher and student. In this research, we explored the effects of identity threat in an interpersonal arena with implications for learning, rather than in the more common test-taking situation. Among the strongest predictors of student growth is the quality of feedback from mentors (Lepper, Aspinwall, & Mumme, 1990; Walberg, 1984). Such feedback is seen as a fundamental aspect of pedagogy by the educational community. If, as is often the case in today's schools, an African American student receives critical feedback from a white teacher, there is a potential for mistrust. The African American may wonder if the feedback reflects a genuine intent to help or if it instead reflects a biased judgment of his or her ability (Crocker & Major, 1989; see also Cohen, Steele, & Ross, 1999). When African American students were led to believe that a white college professor had given them critical feedback on an essay, they saw that feedback as relatively more biased than did white students and felt less motivated to revise their essay (Cohen et al., 1999). In a follow-up study, college science majors received critical feedback on a research presentation from someone they were led to believe was a male science professor (Cohen & Steele, 2002). Compared with male students, female students incorporated relatively fewer of the suggestions for improvement into a revision of their research presentation. In terms of Figure 18.1, critical feedback—a structural factor that should facilitate learning

and motivation—had a positive effect only for the nonthreatened group. Even though our methodology ensured that nonstereotyped and stereotyped students received virtually identical feedback, the two groups perceived it differently. Contrary to a color-blind philosophy, uniform instruction did not have uniform effects.

How can we minimize the threat of negative stereotypes in order to convey feedback more effectively? In another experimental condition, we tested a theory-driven intervention designed to deflect the threatening characterization of the stereotype. Here, students received the same critical feedback as before, but now accompanied with the professor's assertion that he had high standards and his personal assurance that the student in question had the potential to reach those standards. The message, we thought, would invert the meaning of critical feedback in the eyes of stereotype-threatened students. They would see it less as a sign that the teacher had stereotyped them and more as a sign that he believed in their ability. Indeed, African American students receiving the feedback in this manner saw little if any bias and were as motivated as their white peers. Likewise, female science majors receiving this feedback incorporated significantly more of the feedback's suggestions for improvement. A recent field experiment found that the same intervention improved middle-school students' ability to learn from their teachers' feedback on their written work (Yeager, Purdie-Vaughns, Garcia, & Cohen, in preparation).

These studies reinforced the lesson that relatively small interventions, when attuned to important psychological processes, can have large effects (Ross & Nisbett, 1991). They suggested that theory-informed strategies could alleviate identity threat and close gaps in the ability to benefit from educational opportunity.

■ APPROACH TO REAL-WORLD INTERVENTION

Our intervention approach rests on three ideas (Garcia & Cohen, in press)—levers, recursion, and the dynamic nature of social systems. The first, *psychological levers*, are points in a complex system where targeted intervention can produce nonintuitively large and long-term effects. The lever used in many successful interventions concerns core psychological motives for belonging, self-integrity, and competence (Baumeister & Leary, 1995; Ryan & Deci, 2000; Steele, 1988; see also Sherman & Cohen, 2006). When they combat threats to such motives, even brief interventions can have large effects. In this way, social-psychological interventions accomplish what exceptional teachers and mentors do in more impactful ways in the real world (Cohen et al., 1999). They convey to students the message that they belong, have self-integrity, and can achieve a higher standard. These messages can prove especially important for socially stigmatized students, because they help negate a stereotype's characterization that they are seen as lacking ability and as not belonging. Indeed, when teachers have optimistic expectations for their students—higher than what is warranted based on students' prior records—this appears to especially benefit the achievement of minority students (Jussim & Harber, 2005).

Beyond psychological levers, the recognition of recursive cycles is also at the heart of our approach. In school, work, and many other real-world settings, processes can feed off their own consequences. Stereotype threat might lower performance. Lower performance in turn could increase stereotype threat, lowering performance still further, in a repeating cycle. In fact, rather than directly boosting performance, many social-psychological interventions instead interrupt the downward spiral characteristic of such self-exacerbating cycles (e.g., Blackwell, Trzesniewski, & Dweck, 2007; Cohen et al., 2006, 2009; Wilson et al., 2002).

A final key idea in our approach concerns the recognition of the dynamic or interactive nature of forces in a social system (Garcia & Cohen, in press; Ross & Nisbett, 1991). An intervention effect might act as the first spark in a chain reaction. For instance, a small intervention early in the year could raise children's performance. Because of this, their teachers may see such children as being more worthy of attention. The intervention effect could then be carried forward and even amplified by teachers' positive expectations (Jussim & Harber, 2005; Rosenthal & Jacobson, 1992). Such interactions can involve many social and psychological processes. Students who do better early on may come to feel efficacious in school, believe in the malleable nature of intelligence, and trust their teachers, all of which can contribute to better performance (Blackwell et al., 2007; Garcia & Cohen, in press; Tyler, 2004).

Because of recursive, interacting cycles, early outcomes have disproportionate impact. Early differences, even when slight, can snowball into large effects over time, as feedback loops both compound initial differences in performance and broaden their consequences (Caspi, Elder, & Bem, 1987; Cohen et al., 2009; Heckman, 2006). As one example, small early advantages in young athletes' size and coordination—even when due to random variability in when their birthdays fall relative to the start of the sports season—have sizable effects on their prospects of becoming professional athletes (Barnsley, Thompson, & Barnsley, 1985). A child who displays more early competence is likely to be perceived as more able, be given more opportunities to excel, and receive more mentoring. These in turn can advance the child's interests and self-confidence, which in turn can further their opportunities for growth. These recursive processes can play a larger role in domains like math and science, where subsequent learning builds on an earlier foundation of knowledge (see Blackwell et al., 2007). Small differences at an early age become magnified over time, making it increasingly difficult to catch up or enter a discipline later (Miyake, Kost-Smith, Finkelstein, Pollock, Cohen, & Ito, 2010).

The *identity engagement model* incorporates the notions of levers, recursion, and dynamic interaction (Cohen & Garcia, 2008; Garcia & Cohen, in press). It offers a model of how identity threat affects performance and learning in real-world settings over time. Figure 18.2 provides a graphic representation.

People's group identity will be psychologically engaged if they think it could cause them to be judged or treated negatively. For instance, most African Americans know that school and work are places where they could be judged negatively because of their race (Steele & Aronson, 1995; Walton & Cohen, 2007). People tend to

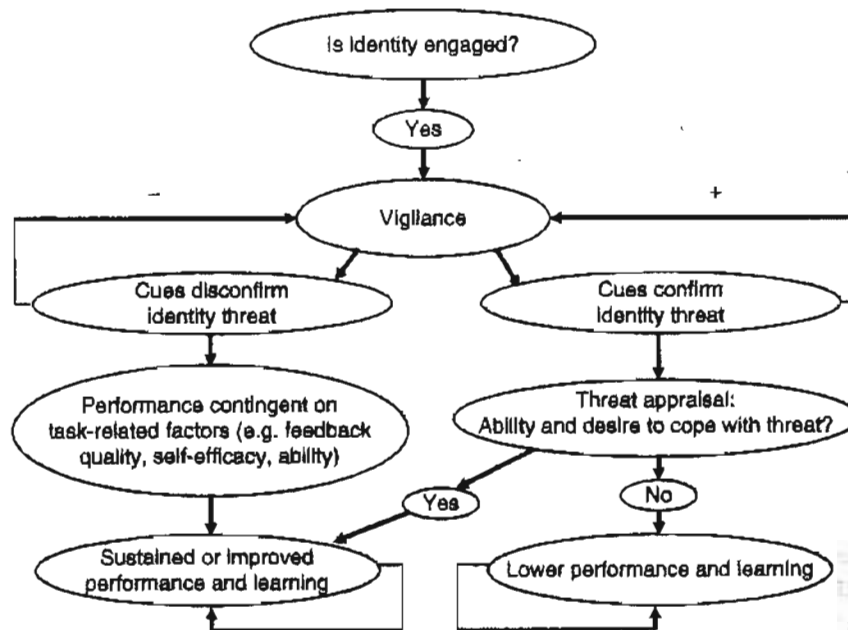


Figure 18.2 The identity engagement model

become vigilant when their identity is engaged (Kaiser, Brooke, & Major, 2006; Murphy, Steele, & Gross, 2007; Purdie-Vaughns, Steele, Davies, Dittmann, & Randall-Crosby, 2008). They comb their environment for cues to discern whether their identity is in fact affecting how they are being viewed. A minority student, for example, might scrutinize a teacher's feedback for evidence of bias (Cohen & Steele, 2002; Crocker & Major, 1989). In this vigilance stage, people engage in what coping researchers call a primary appraisal, asking themselves, "Is there a threat?" (Lazarus & Folkman, 1984).

The cues can *disconfirm* the threat, as when a teacher provides critical feedback with an invocation of high standards and personal assurance. When this occurs, people tend to feel treated as individuals. Their performance depends largely on structural and personal factors, such as the quality of instruction and their skill. The positive forces can assert a relatively direct impact on performance and learning.

But if the cues *confirm* the threat, a threat appraisal phase follows. People engage in a secondary appraisal, asking themselves, "Do I have the desire and ability to cope with this threat?" (Lazarus & Folkman, 1984). The importance of this stage for intervention rests on the insight that, often, it is not so much a particular stressor that is disruptive, but rather the psychological reaction to it. For example, people perform worse under stereotype threat partly because they try to suppress thoughts about the stereotype. They expend mental resources that could otherwise help their performance and, ironically, become more vulnerable to the stereotype's rebounding into consciousness later (Logel, Iserman, Davies, Quinn, & Spencer, 2009; Schmader, Forbes, Zhang, & Mendes, 2009). One can lessen the impact of

a stressor by altering psychological reactions. For example, one study altered college students' psychological reaction to test anxiety by informing them that arousal on standardized tests "doesn't hurt performance and can even help performance." This raised their actual scores on the math section of the Graduate Record Examination (GRE) by almost 1 standard deviation (Jamieson, Berry Mendes, Blackstock, & Schmader, 2010). The intervention, it seems, changed the meaning participants assigned to their bodily state. As a result, sympathetic nervous system activity correlated not with worse performance but better (Jamieson et al., 2010).

In our model, identity threat can escalate, with its consequences feeding off themselves and creating other vulnerabilities. Teachers may label underperforming students as at-risk and assign them to a remedial track, which could further undermine performance and increase disciplinary problems (Rosenthal & Jacobson, 1992; Steele, 1997). After performing poorly, students may worry still more about being stereotyped or seen as not belonging (Wilson et al., 2002). Left to itself, identity threat thus escalates and implicates a broader swath of outcomes (Garcia & Cohen, in press; Cohen et al., 2009). This could help explain the downward spiral in performance and disciplinary problems observed, particularly among minority students, at certain stages like middle school (Eccles, Lord, & Midgley, 1991; Simmons, Black, & Zhou, 1991). Interrupting the recursive and interactive process of identity threat early presents an opportunity to have long-term performance benefits. Even a small initial effect at the beginning of a recursive cycle could serve as a spark that yields benefits that compound and broaden over time (Cohen et al., 2009; Garcia & Cohen, in press).

■ FIELD-TESTED INTERVENTIONS

The vigilance stage, a phase when people assess their environment, lends itself to intervention. The meaning people assign to events, their subjective experience, can be manipulated (Ross & Nisbett, 1991). In the study described earlier, the meaning of critical feedback changed with an invocation of high standards and personal assurance. It no longer reflected a biased judgment but a belief in one's potential (Cohen & Steele, 2002). Vigilance-based strategies provide people with a hopeful narrative for understanding events in their lives, especially adversity.

In one of the experimental conditions in a study by Good et al. (2003), students were exposed to role models who discussed their initial difficulties after moving from elementary to middle school, but who reported getting increasingly better grades as they learned the ropes and kept working (see also Aronson, Fried, & Good, 2002). In another experimental condition, students were led to view intelligence as expandable rather than fixed (see Dweck, 1999). Both interventions lessened the tendency to see frustration in school as evidence of intellectual limitation. Compared with students in a control group, students in both conditions went on to earn higher statewide test scores. Indeed, girls particularly benefited, eliminating the gender gap in math scores. Similar positive effects of such interventions on grades were displayed in a New York City school by low-achieving African and Latino American students from economically disadvantaged backgrounds (Blackwell et al., 2007).

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We explored an intervention conducted at the vigilance stage with our colleague Greg Walton (Walton & Cohen, 2007, 2011; see Walton & Carr, 2011, Chapter 6, this volume). We wondered if an intervention could reframe not the meaning of a single event, like the receipt of critical feedback, but one's entire college experience. As African American students may experience *belonging uncertainty* in school (Walton & Cohen, 2007), visiting and revisiting the question of whether they and members of their race belong, they may globalize the meaning of a setback in school. We tested a strategy addressing concerns about belonging (Walton & Cohen, 2007). It sought to shore up minority students' sense of belonging in school by breaking the false sense that their difficulties were unique to themselves and their race (Steele et al., 2004).

College freshmen were brought into the lab at the end of their first year, a time of consolidation. They were told they would be helping researchers interpret the results of a survey, a survey that we had actually administered to junior and senior students at their school. The results of the survey conveyed that although most first-year students had worried about whether they belonged during the transition to college, these worries subsided. Moreover, the survey concluded, the prevalence and duration of these worries did not differ "across demographic groups." At the heart of the intervention lay two messages: One's difficulties are shared (Schachter, 1959), and there is reason for hope (Snyder, 2000). To facilitate internalization of the message, students were asked to give a speech summarizing not only the survey results but their relevance to their own college experience, ostensibly to help incoming first-year students better understand the transition to college (cf. Aronson et al., 2002).

Relative to both a randomized control condition and campus-wide data, this intervention improved African Americans' grade point average (GPA), an effect that follow-up data indicate persisted through their final year of college (Walton & Cohen, 2011; Walton & Carr, 2011, Chapter 6, this volume). As African Americans benefited most, the racial achievement gap closed by roughly 50%. The intervention had changed the meaning they assigned to their school experience. African Americans receiving the intervention were less likely to globalize the meaning of adversity. On days of hardship, African American students in the control condition dropped in their sense of belonging. But those in the treatment condition did not.

Like the high standards and the assurance strategy, these interventions work by affecting primary appraisal—in this case, the meaning assigned to adversity. Interventions at the vigilance stage can be characterized as preventative. They help to prevent threat from arising or from growing so acute that it triggers a downward spiral (Garcia & Cohen, in press). Can interventions prove effective once such a cycle has taken hold? Can they shore up people's internal resources, so that they have the ability to cope more effectively with a threat (Sherman & Cohen, 2006)? Here an intervention acts like an anti-inflammatory. It lessens the psychological reactions that would otherwise inflame the threat. We directly tested this in a field experiment at a middle school with a roughly equal representation of white and black students (Cohen et al., 2006; Cohen et al., 2009).

The values people hold, such as those tied to their relationships or their religion, form an important basis of their sense of self-integrity. Calling up one's self-defining

values acts to affirm a global view of oneself as virtuous, efficacious, and socially connected (Steele, 1988; see also Sherman & Cohen, 2006). This permits people to see a stressor from a broader perspective, lessening its impact on their sense of self and social worth (Schmeichel & Vohs, 2009; Sherman & Cohen, 2006). For instance, values affirmations reduce psychological stress and threat. When they had reflected on important personal values, people asked to give an impromptu talk in front of a difficult audience had lower levels of the stress hormone cortisol (Creswell et al., 2005). Laboratory studies have also shown that values affirmations can lessen stereotype threat (Martens, Johns, Greenberg, & Schimel, 2006). Anecdotally, some teachers have found that expressive writing, in which underprivileged children relate their troubles to, among other things, social values, can have dramatic positive effects on their engagement with school (Freedom Writers & Gruwell, 1999).

Using such findings as our starting point, children were randomly assigned either to a values affirmation condition or to a control condition. In the former, children completed packets inquiring about their values, such as relationships with friends and family, athletics, and music. After identifying their most important values, they wrote about why these were important to them in a series of structured exercises. Different versions of the intervention were repeated throughout the year. Although each administration lasted only 10–15 minutes, the activity tapped into an important source of meaning for these adolescents. Students in the control condition completed writing exercises focusing on neutral topics, such as an unimportant value or their daily routine.

The affirmation had a positive impact on affirmed African American students, the group under identity threat. They earned a higher GPA in the academic term in which the intervention commenced than did nonaffirmed African Americans. The lowest performing African Americans benefited most. In the affirmation condition, the number of African Americans earning a D or below in the intervention-targeted course was only 9%, whereas in control condition, the rate was consistent with historical norms, 20% (Cohen et al., 2006). Over their remaining 2 years of middle school, only 3% of affirmed African American students were held back in grade or placed in remediation, compared with 9% of nonaffirmed African Americans (Cohen et al., 2009).

Consistent with the idea that early performance outcomes can be carried forward through recursive cycles, the intervention's benefits persisted over the remaining 2 years of middle school, even with no additional administrations in the second year (Cohen et al., 2009). Its benefits rippled out to improve grades in core courses not originally targeted by the intervention. On the whole, the intervention closed the racial achievement gap by roughly 30% over 2 years in students' core courses of English, social studies, math, and science.

Although all students experienced a decline in GPA during middle school, the recursive nature of threat is suggested by the less pronounced drop in GPA of affirmed African Americans relative to nonaffirmed African Americans. For African Americans, the affirmation appeared to interrupt a recursive cycle. It made poor performance in the first few weeks of 7th grade less predictive of both poor achievement and a low sense of belonging for the remaining years of middle school

(Cohen et al., 2006, 2009). The intervention's positive effects on performance and learning in the classroom have been recently replicated with Latino American middle school students and female physics students (Miyake et al., 2010; Sherman, Hartson, Binning, Purdie-Vaughns, Garcia, Taborsky-Barba, Tomassetti, Nussbaum, & Cohen, 2011). The study offers several theoretical insights. First, social identity threat interacts with social experience to shape outcomes. It increases vulnerability to early failure and its recursive impact (Cohen et al., 2009). Such threat can be overcome when interventions interrupt a recursive cycle by combating threats to the motive to see oneself as virtuous, efficacious, and socially connected. Second, one thing that interventions can accomplish is to change the way people encode social experience. In contrast to their nonaffirmed peers, affirmed African Americans no longer globalized the meaning of early failure into a conclusion that they did not belong in school (Cohen et al., 2009). They were also less likely to harbor thoughts about the racial stereotype, as evidenced by a measure of the psychological accessibility of the stereotype given later in students' tenure in middle school (Cohen et al., 2006). Although social identity threat is a powerful process, it is malleable when acted upon by other powerful psychological processes. Finally, social identity threat makes people's sense of belonging more dependent on external contingencies, like adversity or early poor performance, something that these interventions remedy (Walton & Cohen, 2007).

Policy Box

Our results run counter to much conventional wisdom in education, social science, and social policy by demonstrating that social-psychological interventions, even when brief, can help remedy what are often seen as fixed disparities in real-world academic outcomes. Together with programs to improve the opportunities of at-risk students, such interventions can close racial and gender achievement gaps in classrooms.

Setting explicitly high standards, encouraging optimistic interpretations of adversity, and validating students' sense of belonging and self-integrity are among the effective psychological interventions that educators and policy makers can use. This is particularly so when dealing with members of academically at-risk groups, such as ethnic minorities in general and women in math and science. Because such students may worry about being devalued on the basis of their ethnic or gender group, their sense of belonging and self-integrity in such settings may be more uncertain.

To be successful, practitioners must understand the psychological processes that these interventions address. Such knowledge informs decisions about a range of an intervention's elements, such as its activities, timing, and the form of its integration into a classroom or work environment. Knowledge of processes also illuminates the structural factors in a school or work setting that threaten people's sense of belonging, self-integrity, and performance.

Institutionalized beliefs about school and work often presume that achievement is primary and that a sense of belonging and self-integrity is merely a reward for achievement. The reviewed research clearly shows that, to the contrary, such psychological states may be necessary preconditions for success.

■ CONCLUSION

Moving from laboratory research to real-world intervention can have both theoretical and applied implications. Because social identity threat, like other important psychological processes, interacts with other factors in a social system over time, its full character and impact become apparent only over long periods of time, a time scale difficult to observe in the lab (Cohen & Garcia, 2008). Moreover, when targeted at critical points in a recursive, interactive process, interventions can produce apparently disproportionate effects both in magnitude and in duration (Garcia & Cohen, *in press*; Ross & Nisbett, 1991). Indeed, interventions may sometimes have larger effects in real-world social systems like school or work. The recursive elements in them, rather than being noise that occludes effects, may trigger chain reactions that exaggerate small initial benefits (see Paluck, 2009).

Additionally, interventions can interact with preexisting positive forces in the social environment (Garcia & Cohen, *in press*). They can heighten their impact or dampen factors that inhibit their impact. Although social psychological interventions may be necessary for significant change, they are not sufficient. In the absence of positive environmental supports, like committed teachers, a psychological intervention is likely to have little or no effect. The interventions reviewed here have been tested in various schools and with various students, including economically disadvantaged Latinos (Sherman et al., 2011) and women in science (Good et al., 2003; Miyake et al., 2010). However, they have all been tested in relatively racially integrated schools, equipped with qualified staff and basic resources for learning. In such contexts, the interventions close achievement gaps by 30%–40%. It seems plausible that the interventions have relatively stronger effects in such identity-integrated settings, where concerns about being seen stereotypically prove most acute (see Inzlicht & Ben-Zeev, 2000). The efficacy of the interventions in predominantly minority schools and in disadvantaged schools has received less attention (for an exception, see Blackwell et al., 2005). We suspect that in school or work settings with few resources for learning, social-psychological interventions might improve student well-being but would have little impact on learning and performance. After all, the interventions will not teach a child to read, or provide the human and curricular resources that such a student needs to learn to read. But when coupled with such resources, psychological interventions can catalyze lasting positive change (Cohen et al., 2006; Garcia & Cohen, *in press*).

The interventions discussed here share an important quality. They are indirect in nature (Robinson, 2011). The intervention activities have an intrinsic appeal that, on the whole, is not directly linked to a desire to improve performance. Students are not told that activities are intended to improve their well-being or achievement. Instead students are involved in enjoyable activities, such as writing about values they cherish (Cohen et al., 2006, 2009), participating in fun tutorial sessions about the brain and its potential for growth (Blackwell et al., 2007; Good et al., 2003), or helping others in need (Aronson et al., 2002; Walton & Cohen, 2007). Indeed, the benefits of the affirmation exercise are lessened when it is presented as a means to improve self-integrity (Sherman, Cohen, Nelson, Nussbaum, Bunyan, & Garcia, 2009).

Indirect strategies are particularly important in situations where more direct approaches may increase threat. For instance, persuasive education that focuses people on the health and obesity consequences of bad eating habits risks stigmatizing and thus threatening those they are designed to help. For any intervention, the objective benefits to recipients may be offset by the consequences of being identified as "in need" (Schneider, Major, Luhtanen, & Crocker, 1996). Effective interventions circumvent this problem by making their support subtle or embedded in intrinsically appealing activities and social causes (see also Bolger & Amarel, 2007; Lepper et al., 1990; Robinson, 2011).

All the interventions discussed here are also grounded in hard-won understandings of motivational processes, the result of years of basic research. By contrast, interventions based on intuitive theories of motivation, such as praising children for their abilities, or doling out rewards and incentives, often backfire (Dweck, 1999; Lepper, Green, & Nisbett, 1973).

Understanding the effects of identity threat can help explain when and why people from all walks of life perform below their potential (Steele et al., 2002). Moreover, interventions minimizing the effects of identity threat can have a more global impact beyond achievement, including on health (see Inzlicht, Tullett, & Gutsell, 2011, Chapter 7, this volume; Walton & Cohen, 2011). Because inequalities in education correlate with inequalities in well-being and health, the effects of identity threat—and of interventions to alleviate them—reach beyond the classroom.

■ ACKNOWLEDGMENTS

Portions of the authors' research cited in this chapter were supported by grants from National Science Foundation (NSF/REESE program), Spencer Foundation, W. T. Grant Foundation, Nellie Mae Education Foundation, and Yale's Institute for Social and Policy Studies.

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