

Handbook of Competence and Motivation

Edited by

Andrew J. Elliot
Carol S. Dweck

FOREWORD BY Martin V. Covington



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CHAPTER 24



Stereotypes and the Fragility
of Academic Competence, Motivation,
and Self-Concept

JOSHUA ARONSON
CLAUDE M. STEELE

Human intelligence is among the most fragile things in nature. It doesn't take much to distract it, suppress it, or even annihilate it.

—NEIL POSTMAN (1988)

Despite occasional statements like this from education researchers and commentators, most people think of intellectual competence as a stable thing. We expect children who do well in grammar school to perform well in junior high and high school; we expect those who score well on tests this week to score well next week, and so on. But we are often wrong about this. Although clearly not the most fragile thing in nature, competence is much more fragile—and malleable—than we tend to think. Consider a few examples:

In a recent study by Baumeister, Twenge, and Nuss (2002), college students were

given bogus feedback from a personality test; for some, the test was said to indicate that others would one day reject them. This bad news dramatically interfered with their performance on a standard IQ test they took shortly afterward; they solved about six fewer items than equally smart students in control groups, who got either a different kind of negative feedback or no feedback at all.

Mueller and Dweck (1998) gave students a problem-solving task (engineered to guarantee high performance) and then praised students for their success. The feedback varied by condition, so that

some students were praised for their intelligence (“You must be really smart at these”), while others received effort praise (“You must have worked hard”), and members of a third group were told simply that their score was very high. Later, on a subsequent set of harder problems, those praised for being smart performed significantly worse than the other groups.

College freshmen signed up for a study conducted by Wilson and Linville (1982) because they were struggling academically: They were performing less well than they wanted to, felt intellectually inferior to their classmates, and were generally anxious about doing well in college. By the flip of a coin, some of these students were assigned to receive an intervention—lasting all of a few minutes—wherein they learned that their struggles were not unique, and that many struggling students improve over time in college. Compared to the control group, these students solved significantly more items on a standardized test taken a short while later and dramatically improved their grade point averages (GPAs) in the following year.

Such examples not only show how competence is both fragile and responsive to intervention but also point to why. Specifically, in many contexts, intellectual competence is not just something inside a person’s head (Sternberg, 2002). Rather, it is quite literally the product of real or imagined interactions with others. How a student construes the way he or she is viewed and treated by others matters a lot: how welcomed or excluded, how respected, how tuned in to others’ difficulties and triumphs—these perceptions can exert a profound influence on intellectual competence, on motivation, and ultimately upon a student’s academic self-concept. Competence is fragile, then, because it is transacted within a web of social relations. The social psychology and education literatures are full of examples of how things that influence social relations also influence motivation, learning, and performance (e.g., National Research Council, 2003), but too often we fail to appreciate these social forces.

To be sure, we do sometimes acknowledge impediments to competence—especially our

own competence—as when we experience *stage fright*, *writer’s block*, or some other temporary hindrance. Yet particularly when judging others, we have what amounts to an “innate ability bias” (Aronson, 2002a; Aronson & Jones, 1992); we are apt to assume that people’s intellectual accomplishments are products of internal forces like giftedness, rather than situational ones, like an encouraging social climate (e.g., Dweck, 1999; Jones, 1989). Thus, unless we have prior knowledge to the contrary, students who score poorly on tests or get bad grades in school will probably just seem untalented or lazy. These impressions may be correct some of the time, but in many cases, as in the earlier examples, there is more to the story; social forces are at play that may be hard to see or appreciate, but that nonetheless undermine people’s academic achievement in important ways.

In this chapter, we focus on one set of forces, the influence of stereotypes on academic performance, engagement, and self-concept, which together comprise what we see as fundamental to *competence*. There is much evidence, beginning with research in the 1960s, to suggest that teachers’ expectations about their students can play a significant role in the nurture (or neglect) of student competence (see Rosenthal, 2002). We briefly review similar, more recent, research that applies a similar logic to stereotypes, which are expectations based on category membership. Our own research in this area began several years ago with a search for new answers to the decades-old question about why African American and other minority students’ test performance and achievement lags behind that of white students, even when comparing students who attend the same schools, whose parents are comparably well off and well educated, who come from comparable neighborhoods, and so on (e.g., Herrnstein & Murray, 1994; Jencks & Phillips, 1998; Ogbu & Davis, 2003). The fact that equating students on such background factors reduces yet fails to eliminate the gap in achievement frustrated the standard arguments about genetic or cultural influences on test and school performance, because these arguments rest upon the notion that ability, skills, and preparation account for nearly all the variance in achievement. But because black students

with equal ability and preparation so frequently underperformed in college relative to identically scoring whites (Jensen, 1980), there seemed to be an unaccounted factor at play, something beyond the things to which we customarily attribute achievement. Our research, and that of many others, suggests that part of the problem is rooted in the psychology of stereotyping and stigma, namely, the way people are influenced by stereotypes of intellectual inferiority that surround certain groups in American society.

STEREOTYPES SHAPE SOCIAL INTERACTIONS

One way stereotypes influence competence is that they cause stereotype targets to be perceived and treated differently than nontargets. Stereotypes were nicely described long ago by Walter Lippman (1922/1997) as "the pictures in our heads" that simplify the world by saving us the trouble of thinking when we come into contact with people. These pictures function as expectations of what people in particular categories (boys, girls, blacks, Latinos, etc.) will be like and what they can and cannot do, thus allowing us to fill in the blanks when information is ambiguous or incomplete. The problem, of course, is that stereotypes are overgeneralizations; they encourage simplistic thinking that ignores individual differences between people who belong to certain categories.

There is no shortage of stereotypes about the reputed abilities of social groups, and by a surprisingly young age, Americans become familiar with their content (Aboud, 1988; Huston, 1983). Thus, by middle childhood, most American children have learned that blacks and Latinos are less intelligent than whites, that Asians are good at math, while girls are not, that blacks are better athletes than whites, and so on (e.g., McKown & Weinstein, 2003; Smith, 1990). Not everyone believes the stereotypes, but most people in the culture are aware of them, targets as well as nontargets. Regardless of whether we come to hold these stereotypes as strong convictions or merely as familiar-but-distrusted images, knowledge of their content alone can bias perceptions of stereotype targets (Devine, 1989).

Teachers

This can pose a measurable problem for students who happen to belong to groups alleged to lack academic competence. For example, in a recent study, Arnold and Cross (2003) had teachers rank-order the children in their Head Start classes with respect to their interest in math activities. The teachers rated the Asian children as far more interested than African American or Anglo children, quite in line with the stereotypical image of Asians as math-oriented. But the picture in the teachers' heads was misleading: Expert objective observers found nothing to confirm the teachers' rankings of math orientation—neither the children's self-reports nor objective recordings of children's observed interest in playing math games revealed any differences. The black and Latino kids liked math just as much as the Asian kids, but the teachers missed it.

The problem, as we know from years of research, is that these distorted perceptions are not inert; people act upon them, treating the targets as if the stereotypes are true. Beginning with Rosenthal's Pygmalion studies (Rosenthal & Jacobson, 1968; Rosenthal, 2002), research shows that stereotyped expectations shape social interactions and over time can result in the stereotype's fulfillment, a process known as a "self-fulfilling prophecy." Specifically, if a student's social identity suggests high ability, interest, or potential, he or she may be treated accordingly by a teacher—receiving more warmth, more challenging material, more patience, and so on—and over time, develop into the bright student the teacher imagined initially. By the same token, negative expectancies based on group reputation can have the opposite effect, leading a teacher to create a colder, less challenging environment for students from these groups. For example, teachers in a study by Brophy and Good (e.g., 1974), treated differently students they had labeled as strong or weak. When a "strong" student faltered, say, during a reading task, teachers were more likely to give subtle clues until the student came upon the solution. When a "weak" student faltered, teachers were more likely to simply supply the correct answer, thus depriving the student of the opportunity to build skill and a sense of accomplish-

ment. The process can be subtle and nonverbal, and it can occur without intention among individuals who consciously (and even adamantly) reject the stereotyped notions (Darley & Gross, 1983; Word, Zanna, & Cooper, 1974; Fazio, Jackson, Dunton, & Williams, 1995).

Sometimes the differential treatment is not so unconscious or unwitting. Evidence from various studies shows that teachers sometimes use stereotypes in not-so-subtle ways, attaching social identity to negative behavior or poor performance, such as when the poorest, least liked, children are seated at the back of the room (Rist, 1970), or when incompetence or unruly behavior is openly attributed to race (Tyson, 2003). Whether blatant or subtly expressed, teacher expectations can shape student performance, leading some scholars to cite low expectations—based on stereotypes—as a significant factor in the achievement gap between blacks and whites (e.g., Ferguson, 1998; Weinstein, 2002), and the gap between students of high and low socioeconomic status (e.g., Croizet & Dutrévis, in press).

Parents

Parents, surprisingly, are not immune to the influence of stereotypes. For example, there is research to suggest that the “girls-can’t-do-math” stereotype distorts the way parents evaluate their children’s interests and abilities. Parents in various studies have been found to see their daughters as less interested and adept than their sons at math and science, to see their girls succeeding through effort, but their boys succeeding by dint of natural ability. These attributions shape the messages that parents send their kids, a process very similar to the self-fulfilling prophecy described earlier for teachers. For example, recent research conducted by Tenenbaum and Leaper (2003) found that parents asked more cognitively challenging questions of boys when working through a science problem than when discussing a less male-associated topic, such as interpersonal relations. Remarkably, other research further showed that parents’ beliefs predicted their child’s self-efficacy (confidence) better than actual performance (e.g., Frome & Eccles, 1998). This means that parental ex-

pectations—which are influenced by gender stereotypes—can matter more than a child’s actual ability, interests, and performance in shaping their child’s academic self-concept.

There are, of course, a variety of ways that a child’s orientation to achievement can be shaped by parent beliefs, such as the way they respond to a child’s successes, or with criticism or praise (see Dweck, 1999, for a review), or withdrawal of affection (Elliot & Thrash, 2004; Jones & Berglas, 1978), or the schools, media, or playmates they choose for their children (Harris, 1998). What is clear is that stereotyped notions about intellectual ability can influence the way parents respond to their children, and that these responses, in turn, have effects on various aspects of competence.

Peers

Needless to say, fellow students play a tremendous role in a child’s developing competence and achievement-related self-conceptions. There seems to be validity to the claim that adolescents in American schools care about belonging—fitting in socially with their peers—more than they care about nearly anything else (e.g., Arroyo & Zigler, 1995; Coleman, 1961). Indeed, peer influence is so important that some scholars have been compelled to conclude that teacher or parental influence is secondary to that of other children (e.g., Harris, 1998). Statistics suggest that this is particularly true during the middle school and high school years, when social concerns reach their apex. One sees clues that stereotypes create academic problems at this stage in the fact that this is precisely when many bright and high-achieving students begin to falter academically (e.g., Aronson & Good, 2002; Wigfield & Eccles, 2002), and when most children attain an awareness that certain groups are broadly stereotyped in society (McKown & Weinstein, 2003). Minority students are at increased risk for social exclusion by peers, which, as suggested by the Baumeister et al. (2002) study described earlier, can have direct effects on academic performance. School-based studies confirm that peer rejection imperils school performance and engagement (e.g., the likelihood of dropping out), particularly if those excluded are seen

as hostile, or when teachers are thought to dislike the excluded student (see Harrist & Bradley, 2002, for a review). Children get excluded for a number of reasons—being unattractive, aggressive, or just different (see Killen, Lee-Kim, McGlothlin, & Stangor, 2002, for a review). Racial and ethnic minorities appear to experience more than their fair share of peer rejection (Kistner, Metzler, Gatlin, & Risi, 1993); thus, by itself, minority status appears to lead to differential treatment by classmates and can thereby put students at risk for academic problems. This appears most likely in classrooms where competition is stressed (Aronson & Patnoe, 1997; Sherif & Sherif, 1969).

Social pressures come from within minority groups as well. For example, there is some evidence to suggest that minority students, more than their nonminority classmates, must choose between academic and social success within their ethnic group, because engaging academically invites charges of “acting white” and abandoning one’s social group (Fordham & Ogbu, 1986). Although any student is likely to pay a social price for being too “nerdy,” some peer nomination studies—which ask students to list who is cool, admirable, and influential in their school—suggest that black and Latino males pay the highest social penalties for engaging academically (e.g., Graham, Taylor, & Hudley, 1998). If this is so, then it may partly explain why, as a group, African American males appear to be the least academically identified students in America (Osborne, 1997). In many middle and high schools, there is a trade-off for students between social or academic success that varies in intensity depending on race and gender.

It is important to note that the evidence for peer sanctions against achievement is mixed. For example, studies using national samples of data suggest that adolescents do not generally devalue education (e.g., Spencer, Iserman, Davies, & Quinn, 2001), and that the “acting white” or “oppositional culture” hypothesis may be an overgeneralization from ethnographic case studies (Cook & Ludwig, 1998). Yet these large survey studies have their own limitations as well. There appears to be enough evidence to suggest that, at least under some circumstances and in some schools and classrooms,

social success and academic engagement have inverse relationships, and this may interfere with the development of competence among some minority students.

In sum, stereotypes about academic abilities can inhibit the expression and development of competence by prompting differential treatment by teachers, parents, and peers. For the remainder of the chapter we focus in considerably more detail on different route by which negative stereotypes influence competence.

STUDENTS REACT TO STEREOTYPES

Stereotype Threat

Our research over the last decade shows that a student need never encounter actual prejudice or differential treatment of the sort described earlier to be meaningfully affected by stereotypes. Just as mere knowledge of a stereotype can influence the thinking and behavior of a teacher, parent, or peer, it can also, in a variety of ways, impact the student more directly. Our initial hypothesis (Steele 1992; Steele & Aronson, 1995) was that students targeted by negative stereotypes are bothered by the implications of the intellectual inferiority stereotype—the possibility that they will be viewed through its negative lens, and that the stereotype could accurately characterize them or their group. Confirming a stereotype through low performance poses a threat to at least three important human motives: the need for competence (e.g., White, 1959), the need to appear competent to others (e.g., Jones, 1989), and the need to belong socially in a domain that one values (Baumeister & Leary, 1995).

Thus, our argument goes, compared to people not targeted by stereotypes, in situations where academic competence is relevant—taking a test, speaking up in class, working on a project with peers, or even doing one’s homework, stereotype targets will feel extra pressure not to fail. This extra burden, therefore, could induce black students, Latino students, or women working in male-dominated arenas (i.e., math and science) to perform less well, thereby confirming the stereotype that they want to disprove. Ten years later, we have ample confirmation that this phenomenon—which we named “stereotype threat”—is real, and that

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STEREOTYPES

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tween minorities and whites. Over a hun-
dred studies conducted since we coined that
term have revealed much about the condi-
tions under which stereotype threat under-
mines performance, the groups susceptible
to it, individual risk factors that amplify its
effects, the processes by which it interferes
with achievement, and some useful tech-
niques for reducing its impact on achieve-
ment (e.g., Aronson, 2002b; Steele, Spencer,
& Aronson, 2002). We begin with research
demonstrating its effects on standardized
test performance.

Stereotype Threat and Test Performance

In our early studies, we started with a simple
hypothesis: If concerns about confirming a
negative stereotype undermine standardized
test performance, then arranging situations
to minimize those concerns should boost
performance of individuals stereotyped as
intellectually inferior. To those not stereo-
typed as inferior, the change of situation
should have little or no effect on perfor-
mance. To test this reasoning, we had Afri-
can American and Caucasian college stu-
dents take a difficult standardized verbal

test, which we constructed by culling some
of the more difficult items from an old
Graduate Record Examination (GRE). The
students took this test under one of two con-
ditions. In the “stereotype threat” condition
we presented the test the way such tests are
typically presented: as a diagnostic tool we
were using to measure their verbal ability.
This explicit scrutiny of ability, we thought,
should bring to the fore concerns about con-
firming the stereotype. In the “no stereotype
threat” condition, we presented the same
test as a nonevaluative exercise aimed at
teaching us about the psychology of verbal
problem solving. In other words, we made it
clear to the students that although we
wanted them to try hard to get the problems
right, we were not the least bit interested in
how smart they were. We thought that,
framed in this way, the students should be
less worried about confirming the stereo-
type.

The results suggested we were right. As
shown in Figure 24.1, after we statistically
controlled for individual differences in pre-
paration and verbal aptitude (we covaried out
students’ verbal Scholastic Aptitude Test
[SAT] scores), we found that black students
performed dramatically better in the no ste-

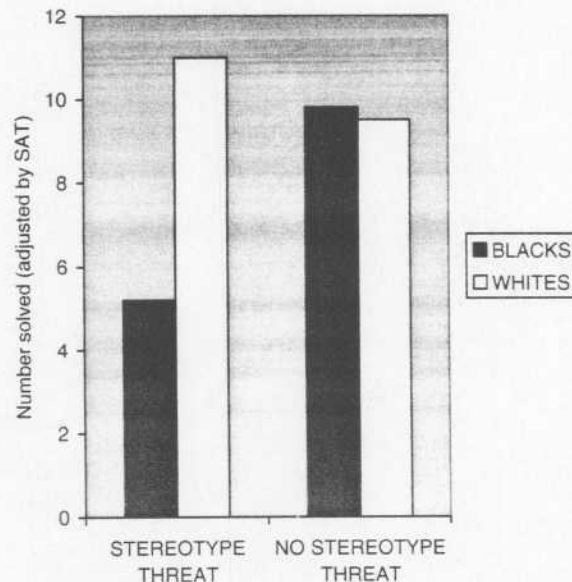


FIGURE 24.1. Test performance under stereotype threat versus no stereotype threat conditions. Adapted from Steele and Aronson (1995). Copyright 1995 by the American Psychological Association. Adapted by permission.

reotype threat condition than they did in the stereotype threat condition. Caucasian test takers were not meaningfully affected by the framing of the test.

Follow-up studies using the same diagnostic-nondiagnostic manipulation provided some clues about the experience of stereotype threat—and to some extent validated our conception of the phenomenon. For example, Steele and Aronson (1995, experiment 3) found that black students who thought that we were interested in measuring their intelligence (on an upcoming test) had more stereotypes on their mind. Specifically, we used an implicit memory measure, which supplies a long list of partial words and asks people to quickly fill in the blanks to make an English word. Cognitive psychologists have found that people completing such tasks will tend to construct words that fit with recently activated (thought about) ideas. Thus, given the word stem (*_ _ C E*), one might come up with a number of different completions (MICE, RICE, FACE, PACE, etc.), depending upon recently encountered stimuli or thoughts. What we found is that black students in our diagnostic condition were significantly more likely to come up with the word RACE—as well as other words associated with black stereotypes on other word stems. They seemed, in other words, to have racial stereotypes on their mind as a result of having their intelligence evaluated. This we took as evidence that stereotypes are indeed linked to the experience of evaluative scrutiny in a domain where competence is relevant. When the evaluative stakes are raised, so too are thoughts about racial stereotypes, suggesting that the two contexts are cognitively associated for African Americans but not for whites.

Moreover, our data suggest the desire on the part of stereotype-threatened black test takers to disprove the negative stereotype. Immediately after the word stem task, our students were given a survey. The survey asked about the kinds of activities they enjoyed—the kinds of sports they played, the kind of music they enjoyed, and so on. Some of these preferences were clearly stereotypical of African Americans (liking rap music, playing basketball, being lazy, and so on). There was a very telling difference in the way that black students filled out the survey.

Those who thought we would be diagnosing their intelligence later on distanced themselves from the stereotypical portrayals of themselves. They reported liking basketball, rap music, being lazy, and so on, significantly less than their counterparts, who thought the upcoming exam was not going to diagnose their abilities. And most (75%) of these students chose the option of not indicating their race at the end of this survey, whereas all the black students in the no-stereotype-threat condition (and all the white students in both conditions) indicated their race. It seemed clear, therefore, that the evaluative nature of the situation made them think about stereotypes and be wary of confirming them.

A subsequent experiment nailed down the role of this wariness in the impairment of test performance among African American students. In this study (Steele & Aronson, 1995, experiment 4), all test takers were put in the nondiagnostic condition of the previous experiment; they were told we would not be evaluating their abilities. But for half, we made their racial identity salient; we asked them just prior to beginning the test to indicate their race on a demographic questionnaire (this time it was not optional). Whereas this mere mention of race had no effect on white test takers, it rather dramatically impaired the black test takers, cutting in half the number of items they correctly solved. This is clear evidence that our attention to race spurred evaluative concerns—and a nice illustration of Postman's claim that it does not take much to suppress human intelligence.

Generality of Stereotype Threat Effects

But this raises a critical question: To what extent do such effects generalize to other groups of humans? Is the experience of stereotype threat limited to African Americans? While stereotype threat may be most likely and most keenly felt among historically stigmatized groups such as African Americans, it is a predicament that can trouble the member of any group, because it is largely a product of circumstances that threaten basic human motives—being competent, appearing competent, and being accepted by others (e.g., Aronson, Quinn, & Spencer, 1998). Thus, anyone who conceivably could be tar-

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geted by a stereotype alleging inferiority could experience pressure to disprove the stereotype. This would be important, because to remove barriers to all students' demonstrating and developing their competence, it is critical to know the extent to which these barriers originate from something unique to their social group, or something more general operating in the situations most students confront. Research conducted over the past decade has mostly supported the generality hypothesis.

For example, similarly dramatic affects using a different manipulation have been found by Spencer, Steele, and Quinn (1999) among women taking mathematics tests. In their study, highly math-proficient male and female college students (they were in the upper 15% of the university population in terms of SAT scores) took a very challenging math test. In the control group, the women performed significantly less well than the men. In the experimental condition, stereotype threat was nullified with a simple statement: "This test has never produced gender differences in the past." In this condition, women's performance rose markedly, equaling that of the men. Other research finds similar effects with Latino students, importantly, with variations on the manipulation of stereotype threat (Aronson & Salinas, 2001), and in another case (Gonzales, Blanton, & Williams, 2002), examining the role of "double-minority status." The former study found impaired performance when the issue of bias in standardized testing was raised; the latter suggested that conditions that make Latina women aware of their ethnicity make them especially likely to underperform on a math test.

Similarly, research has found that the stereotype suggesting that old people's memories are faulty and deteriorating can be similarly disruptive to its targets. When the elderly participants in one experiment were subtly reminded of the stereotype regarding old age and senility, they performed worse on a test of short-term memory than when they were reminded of the more positive "old-people-are-wise" stereotype instead (Levy, 1996). In a subsequent study by Hess, Auman, Colcombe, and Rahhal (2003), older adults read mock newspaper articles on research about aging and memory. Half of the articles presented negative findings

that suggested mental declines were inevitable. The other half presented more positive findings, which implied that some mental skills lasted into old age, and that cognitive declines could be slowed. After reading the articles, the subjects were given a memory test in which they had to recall a list of words. Those who read the positive article performed about 30% better on the test than those who read the negative article.

Jean Claude Croizet and his colleagues have found that stereotype threat effects extend to students of low socioeconomic status (Croizet & Claire, 1998; Croizet & Dutrévis, in press). This suggests that the stereotype of poor people as less intelligent may contribute to the oft-cited correlation between socioeconomic status and test performance.

Perhaps the most persuasive findings regarding the generality of these effects is that stereotype threat can impair the performance of even those groups who are neither minority nor broadly stereotyped as intellectually inferior—for example, white males at top tier universities. In a simple experiment (Aronson, et al., 1999), we asked highly competent white males to take a difficult math test. Both groups were told that the test was aimed at determining their math abilities. For one group we added a stereotype threat: We told them that one of our reasons for doing the research was to understand why Asians seemed to perform better on these tests. In this condition, these highly competent and confident males—most of whom were mathematics or engineering majors—lost a significant number of items on the test. These were students with extremely high skills—most had earned near perfect scores on the math portion of the SAT. Thus, if they can experience stereotype threat, anyone who plausibly can be targeted by a stereotype can feel it (for similar findings with white males see Leyens, Désert, Croizet, & Darcis, 2000; Smith & White, 2002). The rather exotic situation that we imposed upon them—a direct comparison with a supposedly superior group—is, in form, similar to the predicament of blacks and Latinos, who contend daily with such settings in any integrated academic setting. For us, these findings make it easier to accept a situational account of their relatively low academic outcomes; it proves that lower com-

petence or motivation need not be involved in their underperformance.

Studies aimed at discovering the developmental onset of stereotype threat effect show that children, as well as adults, can be impaired by making their stereotyped social identity relevant to an ability test (Aronson & Good, 2002; McKown & Weinstein, 2003). In the Aronson and Good studies, stereotype threat effects did not emerge in children in the fifth grade but showed up reliably among sixth graders—girls on math tests, and Latinos on verbal tests. The McKown and Weinstein studies suggested that children at this stage become stereotype-vulnerable because they are able to grasp the fact that their group is broadly stereotyped in society. Whatever the exact mechanism, it is clear that by middle childhood, children, like adults, can become unnerved by the negative stereotypes about their group's intellectual abilities.

Stereotype threat effects also generalize to other performance domains. In a particularly notable example, Stone, Lynch, Sjomeling, and Darley (1999) found that when a game of miniature golf was framed as a measure of "sport strategic intelligence," black athletes performed worse at it than whites. Interestingly, by framing this same golf game as a measure of "natural athletic ability," the pattern reversed, and the black athletes outperformed the whites. Similarly, Garcia, Helms, and Garcia (2003) report results of a study suggesting that white athletes jumped less high when observed by an African American coach than when observed by a white coach, suggesting a stereotype threat—and therefore partly situational—explanation involving the stereotype that "white men can't jump." Such studies show not only the group-by-situation variability of stereotype threat but also suggest its generalizability in real life across groups, settings, and types of behavior. Studies that we discuss shortly further reinforce the breadth of stereotype threat effects.

Mediation of Test Performance

What mediates the effects of stereotype threat on test performance? That is, how does stereotype threat turn into lower performance? Various researchers have asked this question and, as it turns out, have found

almost as many mediators as they have looked for.

Anxiety

Our original hypothesis (Steele & Aronson, 1995) was this: trying extra hard to disprove the negative stereotype arouses anxiety, which in turn interferes with performance. Although our original studies tested for this—we used standard self-report measures of test anxiety, evidence was spotty at best; we would find it in one study but not in another. Other researchers using self-reports (typically administered retrospectively after the exam) have found similarly inconclusive mediation data. Two research studies used more direct measures and confirmed that anxiety plays at least a partial role. Blascovich, Spencer, Quinn, and Steele (2001) had black and white college students take a difficult verbal test under "stereotype threat" or "no stereotype threat" conditions (the diagnostic test was described as "racially fair" in the no stereotype threat condition). The test takers' blood pressure was monitored throughout the test in all conditions. The study yielded a typical pattern of stereotype threat effects on performance: Blacks performed worst when the test was represented as diagnostic of verbal ability, best when represented as racially fair. But for blacks in the stereotype threat condition, blood pressure rose sharply and significantly above baseline levels, whereas for all other test takers, it dropped. Interestingly, on questionnaires probing for anxiety, there were no differences, suggesting that self-reports may be inaccurate indicators of internal states in stereotype threat situations.

Another way of assessing the role of anxiety is to compare the effects of testing conditions on complex versus simple tasks. Anxiety has long been known to boost performance on simple tasks but interfere with performance on complex tasks. Thus, if stereotype threat did the same, this would be more evidence that anxiety is involved in stereotype threat. In a recent experiment, O'Brien and Crandall (2003) showed just this. Women under stereotype threat performed better on an easy math test than women under no stereotype threat but, replicating earlier stereotype threat studies (e.g., Spencer et al., 1999), stereotype threat im-

paired their performance on the difficult math test.

That stereotype threat arouses anxiety squares nicely with important work on achievement goals. Specifically, Elliot and colleagues find that people experience more anxiety and perform worse when they pursue performance avoidance goals—when they try to avoid comparing poorly to others, as opposed to just doing their best (Elliot & Church, 1997; Elliot, McGregor, & Gable, 1999). Such a mind-set appears to be the least productive and enjoyable way to approach achievement, and it aptly describes the hypothesized goal—and the observed achievement outcomes—of people subjected to stereotype threat. Research is currently under way that directly examines the mediational role of performance avoidance goals in stereotype threat-related underperformance.

Expectations

The previous studies do not, however, force the conclusion that anxiety is the sole mediator of stereotype threat; other processes may be involved. One possible mediator is performance expectations. Some researchers have found that activating stereotypes lowers performance expectations (Stangor, Carr, & Kiang, 1998), but in this study, performance was not assessed, so it is unclear whether these lowered expectations would have translated into lower performance. Other studies (e.g., Spencer et al., 1999; Stone et al., 1999) found no such direct effect of stereotype threat on expectations, despite the fact that stereotype threat impaired performance. Still other studies find that raising performance expectations fails to “wipe out” the effects of stereotype threat on performance. The role of expectations in stereotype threat is therefore likely to be a complex one; because, for one thing, initial expectations based on situational cues that arouse or nullify stereotype threat can change as soon as one encounters success or difficulties while progressing from item to item on a test.

Effort

One would think that a likely response to stereotype threat might be simply to give up or

withdraw effort and, thereby, perform worse. Yet studies that have measured effort—how long people work on the test, how many problems they attempt, how much effort they report putting in, and so on—have revealed no evidence that this happens. In one study, Aronson and Salinas (2001) had participants complete a difficult math test with electrodes on their wrists that purportedly monitored the effort they expended during the test. Participants also understood that they would have to retake the test until an acceptable amount of effort was detected. Despite this elaborate effort-assuring ruse, stereotype threat effects still emerged, suggesting that reduced effort is not a necessary mediator of stereotype threat effects. This hardly forces the conclusion that effort withdrawal *never* mediates these effects. After all, most studies have involved strong students, people who are highly invested in academics, who take a test that is portrayed as an important indicator of their ability. And they work on the test for a relatively short time (usually 20–30 minutes). These are the conditions likely to produce maximal effort. It does not seem unreasonable to assume that less invested students involved in more drawn out tasks might respond to stereotype threat with lower effort. Future research will sort out the conditions under which this strategy is most likely to occur. What can be said with confidence is that lower performance due to stereotype threat can occur without the withdrawal of effort, and this is important to know.

Cognitive Load

Earlier, we noted evidence that black test takers in stereotype threat situations seem to have more stereotypes on their mind, which suggests that stereotype threat imposes an extra cognitive burden. Various studies have examined this situation and found that being stereotype threatened eats up valuable cognitive resources. Schmader and Johns (2003), for example, found that stereotype threat reduces working memory capacity. Croizet, Després, Gauzins, Huguet, and Leyens (2003) found that it increases heart rate variability, an index of cognitive load. Steven Spencer and his colleagues (2001) have found evidence that people under stereotype threat actively try to suppress the negative stereotypes and attendant unpleas-

ant thoughts, a mentally taxing—and largely futile—exercise that consumes resources needed for test performance. Inzlicht, McKay, and Aronson (2004) found that stereotype threat taxes self-regulation capacity, mental energies needed for important executive functions, such as self-control, memory, and organizational skills. In one study, they showed that, under stereotype threat, people were less able to maintain a tight squeeze on an exercise handgrip, a common, non-reactive measure of self-regulation energy. In sum, just about every study that has examined a cognitive-load or divided-attention explanation for stereotype threat effects has found supportive evidence. The exceptions are those studies that employed self-report measures (e.g., Steele & Aronson, 1995; Aronson et al., 1999).

Ideomotor Effects?

One of the most intriguing findings to have emerged in the past several years is that when a stereotype is mentally activated without conscious awareness, people display a remarkable tendency to behave in line with it. Subtly expose college students to words suggesting old age and they will walk more slowly away from an experiment. Do the same with words suggesting rudeness, and they will be more likely to interrupt a conversation a few moments later (Bargh, Chen, & Burrows, 1996). These are called “ideomotor” effects, because they occur automatically, with no apparent mediator between thought and action. Research like this suggests that test performance could likewise be impaired—or lifted—by “priming” social stereotypes associated with high or low ability. In a particularly striking example of such effects, Shih, Pittinsky, and Ambady (1999), found that when primed with their Asian identity, women performed better on a math test. But if they were primed to think of their female identity, they performed worse. These effects do not appear to require any sense of threat or anxiety; people need only know the stereotype’s content. Accordingly, even young students, who are familiar with the stereotypes but are not yet aware of how broadly they are applied, can nonetheless be susceptible to their influence (Ambady, Shih, Kim, & Pittinsky, 2001). The extent to which these direct effects of stereotypes are involved in

underperformance in the real world (where many stereotypes are activated simultaneously) is unclear. It is important to recognize that even in the sterile confines of a laboratory experiment, the effect of such subtle primes on performance is often quite modest: In most studies, they produce no meaningful difference in the number of items solved, but instead impair performance accuracy (the number of items solved divided by the number attempted). Still, more research needs to be conducted to sort out the degree to which this process mediates underperformance of stereotyped groups (Wheeler & Petty, 2001; Steele et al., 2002).

All of these mediation findings suggest that negative stereotypes, in one way or another, impair performance by depleting cognitive resources away from the performance task, by arousing anxiety, or by simply prompting people to unconsciously behave as the stereotype prescribes—or by some combination of these. That researchers have found evidence for several mediators does not, we think, indicate empirical murkiness. Rather, it reflects the complexity and fragility of human performance: there are many ways to fail. Indeed, the fact that one can find several different pathways between the presence of stereotypes and impaired performance should, if anything, strengthen our confidence in the relationship between negative stereotypes and performance difficulties. All the pathways seem to lead to the same result.

Situational Risk Factors for Stereotype Threat

Implicit in the findings of much of the research discussed earlier is that certain situations are likely to give rise to stereotype threat. For example, in the Steele and Aronson (1995) studies, both ability evaluation and the salience or implied relevance of racial identity induced the underperformance among black students. Likewise, cues about the biased or fair nature of this tests were sufficient to turn on or off stereotype threat in other studies, such as the Aronson and Salinas (2001), Blascovich et al. (2001), and Spencer et al. (1999) studies. Thus, one can see the inherent difficulty in arranging situations to reduce stereotype threat, given that the evaluation of abilities is endemic to

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This latter point is underscored by recent experiments conducted by Michael Inzlicht and colleagues, which show how group composition can matter. In one study (e.g., Inzlicht & Ben-Zeev, 2000), highly competent female undergraduates took a difficult math exam in small groups. Depending on the condition of the experiment, the researchers added one or more men to this testing session. The mere presence of one male test taker was enough to significantly impair the performance of the female test takers in the group. Moreover, adding another male into the testing session, such that women were outnumbered, produced an increase in stereotype threat and a corresponding drop in the women's performance, a linear effect of gender integration on underperformance. Inzlicht, Aronson, Good, and McKay (2003) reported effects that suggest African Americans are sometimes susceptible to such effects as well. The critical variable in these studies seems to be the salience of one's negatively stereotyped social identity, which minority status activates and apparently amplifies. Studies also show that the variety of cues regarding social identity—the gender or race of the test administrator, or a recently viewed TV spot in which women are depicted stereotypically—can have disruptive effects on performance (e.g., Marx & Roman, 2002; Davies, Spencer, Quinn, & Gerhardtstein, 2002). In sum, there are two primary triggers that can turn the performance of challenging cognitive tasks into a stereotype-threatening situation—ability evaluation, and the salience of a social identity that is stereotyped as inferior in the ability domain.

Stereotype Vulnerability: Individual Risk Factors for Underperformance

Such triggers are not equally unnerving to all individuals. Important individual differences make some individuals more vulnerable than others to the kind of underperformance we have been discussing. The sum of these risk factors can be thought of as "stereotype vulnerability." The following factors appear to contribute to an individual's level of stereotype vulnerability.

Domain Identification

In his remarkable book, *A Hope in the Unseen*, Ron Suskind (1999) tells the true story of a high school student, Cedric Jennings, who beats the odds: Poor, black, and schooled in the worst high school in Washington, DC, he succeeds through grit, determination, and intelligence to make it into the Ivy League. When Cedric gets his score on the SAT, he is disappointed but remains determined. He buckles down hard and studies his SAT prep virtually night and day, hoping to lift his score when he takes it again several months later. He goes at his studies with the devotion and drive that we hope to find and cultivate in our students. In the language of educational psychology, Cedric is a highly *engaged* or *identified* student. He cares. When he gets his scores back, we see the ironic fruits of his labor—his score has *dropped* significantly.

This is a perfect illustration of a commonplace finding in our research: Stereotype threat it is most keenly felt by the individuals who care most about doing well. In a number of studies, we have measured the degree to which people care about a particular domain—how much they value doing well in math, science, or any particular domain of academic achievement, and how much doing poorly in the domain threatens their self-esteem. What we find is that underperformance under stereotype threat is more pronounced for those who really want to do well (Aronson et al., 1999; Aronson & Good, 2001a). This is quite logical, of course. We would not expect to be unnerved by a stereotype alleging a lack of ability if that ability was trivial. The irony is that we increasingly see high-stakes testing used to evaluate our students' progress or suitability for admissions to institutions of higher learning, or to advance from one grade level to the next. It is unfortunate that, in a sense, we punish those minority students—like Jennings—who care the most about doing well, and who will go through hell and high water to succeed.

Group Identification

The best available research suggests further that people who feel a deep sense of attachment to their ethnic or gender group are also

more at risk for feeling stereotype threat. Some individuals are less invested than others in their gender or racial identity, and initial research into this area of research, while not yet definitive, suggests that the less attached to or identified with one's group, the less one will be bothered by stereotypes impugning that group's abilities (e.g., Schmader, 2002). Apparently, in some cases, there can be an unfortunate trade-off for feelings of group pride and solidarity; deep identification with one's own group can create difficulty navigating integrated situations in which stereotypes may be relevant. Group identification may in part explain the fact that black immigrants, such as West Indians, have been found to be less vulnerable to stereotype threat despite the fact that they are seen and often treated as African Americans—and are quite aware of the negative stereotypes. They simply have less identification with African American identity and can easily draw positive benefits from their West Indian identity. This is particularly true among first-generation West Indians; those from the second generation, who identify more with an African American identity, appear to be more vulnerable to underperformance than their first-generation counterparts (Deaux et al., 2003).

Stigma Consciousness and Rejection Sensitivity

One reason group pride may heighten stereotype threat is that it often comes along with higher expectations for discrimination. Studies of "racial socialization" find that African Americans who have experienced discrimination in their lives often attempt to prepare and shield their children from such discrimination by teaching them to expect it—and to counter it with pride in their group (e.g., Hughes & Chen, 1999). Thus, along with a sense of group pride, some children also develop a heightened sense of what Pinel (1999) calls "stigma consciousness" and what Mendoza-Denton, Purdie, Downey, and Davis (2002) call "race-based rejection-sensitivity." Both measure the tendency to expect and to be bothered by prejudice, and people who score high on these measures perform worse in evaluative testing situations (e.g., Brown & Pinel, 2003; Aronson & Inzlicht, 2004).

Acceptance of the Stereotype

One need not believe a stereotype in order to feel threatened by its implications. Even if one rejects the premise of a stereotype, one nevertheless must contend with others and what they think. One can still feel uneasy or alienated in academic settings if there is a suspicion of inferiority—and these feelings, we have shown, are sufficient to undermine performance (Aronson, et al., 1999). But it seems reasonable to assume that some people may suspect that a stereotype may have some validity, a "kernel of truth," and such individuals would presumably be more threatened by the stereotype. Using subtle measures of people's implicit acceptance of stereotypes, recent research shows that the more people accept the stereotypes as true, the more vulnerable they are to stereotype threat (Spicer & Monteith, 2001; Schmader, 2002).

Self-Monitoring?

Because stereotype threat, as suggested earlier, stems partly from concern regarding other's impressions, people who are particularly good at managing impressions may be less susceptible to stereotype threat. Some recent research led by Michael Inzlicht (Inzlicht et al., 2003) suggests that this is indeed the case. In this research, black students took standardized tests either in the presence of other black students or one or more white students. The results showed that self-monitoring mattered. Only those black students who were "low self-monitors" were impaired in the presence of whites. Low self-monitors are typically less concerned with creating positive impressions; they just want to be themselves. As a result, they may be less practiced at the art of contending with situations where they are at risk of looking bad. More research is under way to examine these results, but they are also mirrored in studies involving women and mathematics, which suggest a robust relationship between self-monitoring and reactions to stereotype threat.

Beyond Test Performance

Stereotype threat effects such as we have described have been observed for many differ-

ent populations and by numerous researchers. They have also been found on a variety of different tests, such as the GRE (Steele & Aronson, 1995), the Texas Assessment of Academic Skills (Aronson & Good, 2001b), Raven's Progressive Matrices (Croizet & Dutr vis, in press), and the Advanced Placement (AP) Calculus exam (Stricker & Ward, 1998), among others. If the influence of stereotype threat were limited to performance on standardized tests, this would be bad enough; performance on these tests is associated with important life outcomes, such as admission to college, advanced placement in college, and eventual earnings (e.g., Jencks & Phillips, 1998). But recent research suggests the role in other important indices of competence, such as the avoidance of challenge, identification with academics, and academic self-image.

Avoidance of Challenge

It is axiomatic in educational psychology that intellectual growth requires intellectual challenge. Yet when stereotypes are salient, challenge can signal the potential for racial or gender devaluation—in others' eyes and in one's own eyes as well. Aronson and Good (2001b) wanted to see whether, in addition to performance differences, children would respond to an evaluative setting by shying away from challenging problems in favor of easy, success-ensuring ones. They found that at the 6th grade (but not before), children did just this: They selected easier problems on an evaluative test but selected problems appropriate for their grade level when the test was framed as nondiagnostic of their abilities. This was true of both Latinos on a reading test and girls on a math test, a finding that mirrored precisely the performance differences we found for 6th graders. Jeff Stone (2002) has found nearly identical results: Under stereotype threat, athletes were more likely to avoid practice. Similarly, Pinel (1999) showed that women most prone to stereotype threat avoided tests in domains in which women are stereotypically alleged to be inferior to men. Such avoidance tactics are quite related to *self-handicapping*, in which individuals interfere with their own performance in order to have a plausible excuse for failure. One can well imagine that when given the choice

of curriculum that is challenging or not, the potential for encountering stereotype-threatening circumstances may steer people toward lower threat alternatives, and as a result, missed opportunities for developing competence.

Grades

In an important study, Massey, Charles, Lundy, and Fischer (2003) conducted a longitudinal survey of over 4,000 freshmen from different ethnic backgrounds attending over 28 U.S. colleges. These students were surveyed each year, and their performance in college was monitored throughout their undergraduate careers. Unsurprisingly, Massey et al. found the common achievement gaps observed between groups; Asians and whites outperformed blacks and Latinos, even when controlling for SAT scores, family income, and other important background factors. But when students' responses to questions probing their degree of stereotype vulnerability were controlled, the grade gaps disappeared; the degree of stereotype threat they felt as freshmen was associated with lower grades. This not only tells us that stereotype threat influences GPA, it tells us that it is a phenomenon that operates in the real world, outside the psychology laboratory.

Disidentification

After blunders or failures, people tend to rationalize. When people fail a math test and then claim the test was biased against them or that they do not really care about math anyway, we refer to this response as *devaluing*—and nearly everyone engages in some form of it (Major, Quinton, & McCoy, 2002). But when the response becomes so chronic that people adjust their self-concepts, divesting their self-esteem from the domain, this response can thwart achievement. We call this chronic adaptation "disidentification." We noted earlier that stereotype threat is strongest among students who are most invested in doing well, those who are highly identified with an intellectual domain. Disidentification helps by reducing sensitivity to failure. Although failure in and of itself is enough to prompt disidentification, stereotype threat appears to make it a more common response among

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blacks and Latinos, because the stereotype suggests not only a lack of ability but also limited belongingness in the domain (Cohen & Steele, 2002). But disidentification in the long run will hurt achievement because some degree of psychological investment is necessary; caring about doing well underlies the motivation for achievement (Osborne, 1997; Steele, 1992, 1997).

Rejection of Feedback

Targets of stereotypes suspect that others hold negative views about their group. Whether or not it is justified by actual prejudice, this can create an atmosphere of mistrust in any situation where those stereotypes are relevant (e.g., Cohen & Steele, 2002; Major et al., 2002). Thus, when a black student receives feedback from a white evaluator, it may be rejected as prejudiced. As Crocker and Major (1989) have shown, this "discounting" of feedback preserves self-esteem. But as Cohen and Steele's (2002) research suggests, it also impairs motivation. It is as if the student asks, "Why try hard to do a good job when whatever I do will be devalued?" Indeed, even positive feedback is often discounted. In a recent study by Lawrence and Crocker (2002), we see just how tricky the business of giving feedback can be in the context of a negative stereotype. White evaluators gave both blacks and whites a test that was engineered to produce high performance. For half the participants, she simply wrote the score on the exam. For the other half, she added the words "great job." The white students reacted quite differently to this detail: The black students thought the evaluator had lower expectations of them when they received the praise, as though surprised by a black student's high performance.

Thus, although there are clear benefits in terms of self-esteem maintenance, discounting feedback has serious drawbacks; one loses motivation and, presumably, important information about how to improve one's performance whenever one rejects feedback. Moreover, Aronson and Inzlicht (2004) have found that those most vulnerable to stereotype threat (as measured by questionnaire responses) have unclear academic self-concepts; that is, they are less aware of their strengths and weaknesses than individuals

who are not stereotype-vulnerable. Because this sort of awareness is a key component of competence—one needs to know one's weaknesses to improve on them or compensate for them—lacking clarity can be a risk factor (e.g., Sternberg, 1996). Thus, all of these self-image protective strategies—avoiding challenge, avoiding practice, avoiding evaluation, and discounting feedback—reveal another irony about stereotype threat: Often, *feeling* competent matters more than becoming competent.

BOOSTING THE PERFORMANCE OF STEREOTYPE-VULNERABLE STUDENTS

One advantage to explaining underperformance in terms of situational variables is that this both implies and points the way to situational solutions to boosting performance. At the same time, given the nature of the triggers to stereotype threat—evaluative situations and social identity salience, changing situations to reduce the threat may be more difficult in the real world. Although schoolteachers can work to create a non-evaluative atmosphere in class, doing so on tests is another matter. Likewise, since the mere mixing of students can arouse stereotype threat even in the absence of evaluation, the diverse classroom or testing center is likely to be rife with apprehension for minority students who are invested in doing well.

Yet there is mounting evidence from both laboratory and field studies that the gaps in performance can be narrowed with careful attention to how situations are created and to what students can be taught.

Situational Approaches

Cooperation

Stereotyping and intergroup tensions tend to thrive in the competitive settings, as in traditional American classrooms. A number of interventions have yielded impressive gains in the academic achievement of minority youth by structuring classroom or study environments to minimize the performance-undermining processes akin to those have discussed here. E. Aronson's "Jigsaw Class-

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room" (Aronson & Patnoe, 1997) and Uri Treisman's (1992) work with African American math students are outstanding examples in this regard. In the Jigsaw Classroom, lessons are broken up into several pieces, with one piece distributed to each member of the group, who must learn the material and teach it to the others. To perform well, therefore, students must cooperate, because the piece of the puzzle held by each student is vital to everyone's successful learning and performance. Studies of the Jigsaw Classroom show that the technique typically raises the minority students' grades (by about a letter grade), raises their self-esteem, increases friendships between ethnic group members, and leads to greater enjoyment among students of all backgrounds. (In some cases, the nonminority students also benefit academically, but in no case do they ever do worse than in the traditional classroom.) In Treisman's calculus workshops, there is also cooperative group study outside of class in special homework sessions, but the cooperation is not rigidly divided as in the Jigsaw Classroom. Moreover, the work is very challenging, going beyond what is covered in class. Treisman's program lifted the African Americans' calculus achievement to surprising levels; they earned grades as high as the Asian students in the class. Getting children or adult students to work cooperatively not only reduces prejudice (and thus stereotype threat), but it also ensures that all students feel a sense of belongingness. These studies are touchstones; they prove that group differences are tractable, that achievement gaps narrow under the proper social conditions.

Drawing on the Treisman work, Steele, Spencer, Davies, Harber, and Nisbett (2001) designed a comprehensive program for first-year students at the University of Michigan. This program sought to reduce stereotype threat through a number of tactics. First, students were recruited to the program in a way that emphasized that they had already met the tough admission standards at the University of Michigan. During the program, students participated in weekly seminars throughout the first semester that allowed them to get to know one another and to learn some of the common problems they shared. They also participated in subject mastery workshops in one of their courses

that exposed them to advanced material that went beyond material in the class. These tactics were designed to convey three vital messages: that instructors and peers believed in their potential to excel academically, that they would not stereotype them, and that they believed they belonged at the university. Several years of the program demonstrate that such practices can lead to a substantial increase in African American's performance in school. On average, African Americans randomly assigned to the program do .4 of a grade point better than African Americans randomly assigned to a control group. This increase in performance, despite diminishing somewhat over time, led to higher retention rates. What makes the program work? Analysis of survey data collected from the program participants and the control group suggests that the program decreases stereotype threat, which in turn promotes identification with school, which leads to better grades and retention.

Individual Approaches

Forewarning

Can awareness of one's susceptibility to processes such as stereotype threat release one from its effects? In other words, is forewarned forearmed? Apparently so, according to two recent studies. In one (Aronson & Williams, 2004), prior to being tested in the Steele and Aronson paradigm described earlier, black college students were sent and instructed to read a pamphlet describing either the stereotype threat effect, the phenomenon of test anxiety, or a completely unrelated topic. Those in the first two conditions performed just as well as those who took the test under no stereotype threat conditions; those in the control group performed significantly less well, as low as those students under stereotype threat but not forewarned. A very similar study (Johns & Schmader, 2004) found precisely the same effect with women taking a difficult math test. These studies are important for those of us who are interested in interventions to boost student achievement, but they also provide relief for those of us who worry that teaching their psychology students about the research might create rather than reduce a vulnerability to stereotypes.

Reframing Ability

Based on research by Carol Dweck (e.g., 1999), Aronson (1999) predicted that stereotype threat would be least problematic for students who conceived of their abilities as malleable. After all, if the stereotype gains power by implying a lack of ability, stereotype threat should be less threatening if one sees ability as expandable. To test this reasoning, students took a difficult GRE verbal test presented as a test of an ability that was either malleable or fixed. As predicted, the African Americans—and to a lesser degree the whites—performed much better and reported lower performance anxiety when the test was said to diagnose an ability that could be expanded with practice. The utility of seeing ability as malleable is further underscored in a similar study (Aronson, 1997). In this study, undergraduates were led to believe they had either performed well or poorly on a test measuring their speed-reading ability. Prior to receiving the feedback, the test takers had been led to believe either that speed-reading was a highly improvable skill, or that it was an endowed ability that could not be improved much with practice. At issue was how the feedback and the conception of the ability would interact to influence how much the students devalued the importance of speed-reading. The results were clear. When speed-reading was presented as a trait that could not be improved, test takers who received positive feedback gave it high ratings (“Speed-reading is an extremely valuable skill”). In contrast, test takers who received negative feedback did not believe that speed-reading was an important skill. This devaluing did not occur when the test takers were led to believe that they could get better at speed-reading. Students in both groups in this condition—those who got positive feedback and those who got negative feedback—said that speed-reading was an important skill. Thus thinking of a skill as malleable appears to reduce the tendency to disidentify in the face of failure.

A pair of field interventions built upon these findings. One program involving African American and European American college students (Aronson, Fried, & Good, 2002) employed numerous tactics of attitude change to get them to adopt the malleable

intelligence mind-set. Attitudes toward academic achievement and actual performance were assessed 4 months later and at the end of the school year. The results were highly encouraging. On average, African American students improved their grades (overall GPA) by .4 grade point. In a second program (Good, Aronson, & Inzlicht, 2003), college students mentored Latino and European American junior high students. The mentors conveyed to their students different attitudes that we hypothesized would help the students navigate the difficult transition year from elementary school to junior high school. For one group of students, the mentors focused on the idea that intelligence is expandable; for another group of students, the mentors discussed the perils of drug use. At year's end, students mentored in the malleability of intelligence received higher scores on the statewide standardized test of reading ability than students who received the antidrug message. Similar results were found for girls' math performance on the mathematics test. When the malleability message was not incorporated into the mentoring, girls underperformed relative to boys. When they were taught about the expandability of intelligence, their performance increased substantially. Similarly positive results were found in an additional condition, in which the students were taught to attribute any difficulties or anxieties they were experiencing to the normal difficulties of junior high rather than any lack of ability. This is a replication of the intervention by Wilson and Linville (1982), described at the beginning of this chapter. This research shows that although stereotype threat is a real phenomenon, it is certainly not insurmountable; there are many ways to overcome its effects. What remains to be studied is the extent to which elements in each of these studies can be combined to produce additive effects on performance.

In considering the effect of stereotypes on achievement, we think it is vital to realize that competence is both fragile and malleable. Social relations—how people think about and treat one another—can make a big difference for achievement. The good news is that understanding this can help us reduce some of the achievement inequities that continue to perplex researchers, educators, and policymakers. But we hasten to un-

underscore that arguing that stereotypes can undermine student performance, motivation and self-concept should not be taken to mean that these are the *primary* sources of the achievement gap. There are bigger factors at play, most notably, inequities in socioeconomic background, schools, and teacher quality that put many minorities at a distinct disadvantage. But we do think that stereotypes account for a meaningful portion of the gap that remains when these factors are equivalent. The fact that the minority-white achievement gap persists—and continues to puzzle those who study it—lies partly in the difficulty of recognizing the forces that can make human competence more fragile than we customarily think.

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