

Journal of Experimental Psychology: General

Breaking the Cycle of Mistrust: Wise Interventions to Provide Critical Feedback Across the Racial Divide

David Scott Yeager, Valerie Purdie-Vaughns, Julio Garcia, Nancy Apfel, Patti Brzustoski, Allison Master, William T. HSSERT, Matthew E. Williams, and Geoffrey L. Cohen

Online First Publication, August 12, 2013. doi: 10.1037/a0033906

CITATION

Yeager, D. S., Purdie-Vaughns, V., Garcia, J., Apfel, N., Brzustoski, P., Master, A., HSSERT, W. T., Williams, M. E., & Cohen, G. L. (2013, August 12). Breaking the Cycle of Mistrust: Wise Interventions to Provide Critical Feedback Across the Racial Divide. *Journal of Experimental Psychology: General*. Advance online publication. doi: 10.1037/a0033906

Breaking the Cycle of Mistrust: Wise Interventions to Provide Critical Feedback Across the Racial Divide

David Scott Yeager
University of Texas at Austin

Valerie Purdie-Vaughns
Columbia University

Julio Garcia
University of Colorado at Boulder

Nancy Apfel
Yale University

Patti Brzustoski
Columbia University

Allison Master
University of Washington

William T. Hesser
University of Chicago

Matthew E. Williams
Bronx Construction and Design Academy

Geoffrey L. Cohen
Stanford University

Three double-blind randomized field experiments examined the effects of a strategy to restore trust on minority adolescents' responses to critical feedback. In Studies 1 and 2, 7th-grade students received critical feedback from their teacher that, in the treatment condition, was designed to assuage mistrust by emphasizing the teacher's high standards and belief that the student was capable of meeting those standards—a strategy known as *wise feedback*. Wise feedback increased students' likelihood of submitting a revision of an essay (Study 1) and improved the quality of their final drafts (Study 2). Effects were generally stronger among African American students than among White students, and particularly strong among African Americans who felt more mistrusting of school. Indeed, among this latter group of students, the 2-year decline in trust evident in the control condition was, in the wise feedback condition, halted. Study 3, undertaken in a low-income public high school, used *attributional retraining* to teach students to attribute critical feedback in school to their teachers' high standards and belief in their potential. It raised African Americans' grades, reducing the achievement gap. Discussion centers on the roles of trust and recursive social processes in adolescent development.

Keywords: trust, stereotype threat, critical feedback, stigma, attributional ambiguity

Constructive feedback is among the most powerful tools for promoting children's social, moral, and intellectual development (Hattie & Timperley, 2007). Whereas much is known about how to praise children (Brophy, 1981), and how not to praise them (Mu-

eller & Dweck, 1998), much less is known about how to effectively provide criticism (see, e.g., Kluger & DeNisi, 1996). How can one convey criticism that could lead to improvement without undermining motivation and self-confidence? This problem is

David Scott Yeager, Department of Psychology, University of Texas at Austin; Valerie Purdie-Vaughns, Department of Psychology, Columbia University; Julio Garcia, Department of Psychology, University of Colorado at Boulder; Nancy Apfel, Department of Psychology, Yale University; Patti Brzustoski, Department of Psychology, Columbia University; Allison Master, Department of Psychology, University of Washington; William T. Hesser, Department of Economics, University of Chicago; Matthew E. Williams, Bronx Construction & Design Academy; Geoffrey L. Cohen, Graduate School of Education and Department of Psychology, Stanford University.

Support for this research was provided by grants from the National Science Foundation/REESE Division (Award 0723909), the Spencer Foundation (Award 200800068), W. T. Grant Foundation, Nellie Mae Educa-

tion Foundation, the Thrive Foundation for Youth, and Yale University's Institute for Social and Policy Studies. The research was also supported by National Science Foundation Grant DRL-1109548. We would like to thank the students, school administrators, teachers, and families involved in this research. We also thank Rebecca Bigler, Carol Dweck, Lee Ross, David Sherman, Sander Thomaes, and Gregory Walton for their comments on earlier drafts of this article.

Correspondence concerning this article should be addressed to David Scott Yeager, Department of Psychology, University of Texas at Austin, 108 East Dean Keeton, Stop A8000, Austin, TX 78712-1043, or to Geoffrey L. Cohen, Department of Psychology, Stanford University, Jordan Hall, Room 224, Stanford, CA 94305. E-mail: dyeager@utexas.edu or glc@stanford.edu

known as the “mentor’s dilemma.” It concerns a wide range of practitioners, including teachers, coaches, counselors, and clinicians (G. L. Cohen, Steele, & Ross, 1999).

A common solution to this dilemma is to give praise prior to delivering criticism in order to bolster self-esteem and mitigate the possible negative impact (cf. Brummelman et al., 2013; G. L. Cohen et al., 1999). In contrast, our research rests on the assumption that *trust* is the crucial component for successfully delivering critical feedback (G. L. Cohen et al., 1999). As Gestalt psychologists have long asserted, the meaning of a stimulus depends on the context in which it occurs (Asch, 1957). Conviction that the parties in an exchange are acting in good faith creates a cognitive context for viewing feedback in a positive light (Bryk & Schneider, 2002; G. L. Cohen et al., 1999; Gambetta, 1988). Trust permits people to disambiguate feedback and to see criticism as information that can help them improve rather than as possible evidence of bias. When trust is uncertain, however, a critical evaluator’s intent can come under suspicion (Bryk & Schneider, 2002). Mistrust can lead people to view critical feedback as a sign of the evaluator’s indifference, antipathy, or bias, leading them to dismiss rather than accept it. Given this, an important question is how a mentor can build trust so that critical feedback will be acted on.

We examine this in a context where trust can prove tenuous: critical feedback given by a White teacher to an African American student. Representative sample surveys consistently find that even when controlling for differences in income and educational level, African Americans have lower general trust than most other racial and ethnic groups in the United States, especially relative to White Americans. For instance, African Americans are less likely to assert that in general people “try to be fair,” and more likely to assert that in general people “try to take advantage of you if they get the chance” (Smith, 2010; Uslaner, 2002). For African American adolescents, at least two factors give rise to mistrust in school: the recognition that they could be seen through the lens of a negative stereotype about the intellectual ability of their racial group (G. L. Cohen & Steele, 2002; Crocker & Major, 1989; Steele, Spencer, & Aronson, 2002) and the real possibility that others could be prejudiced or discriminate against them (Brown & Bigler, 2005; Hughes, Bigler, & Levy, 2007). A large body of research attests to the subtle and not-so-subtle cues that send the message to minority students that they are seen as lacking and as not belonging in school (Dovidio & Gaertner, 2000; Greenwald & Banaji, 1995; Walton & Cohen, 2007). These include, among others things, harsher disciplinary actions, colder social treatment, and patronizing praise (e.g., Harber et al., 2012; Wallace, Goodkind, Wallace, & Bachman, 2008). Given this, it is understandable that African Americans, particularly during adolescence with its growing awareness of social realities (Brown & Bigler, 2005; McKown & Weinstein, 2003), would begin to have a measure of mistrust toward teachers and other academic authorities.

Mistrust could undermine motivation when ambiguity exists in the feedback interaction, and African American students may face more ambiguity in it. They may wonder if the teacher’s criticisms signal a genuine desire to help or a bias against their racial or ethnic group (Crocker, Voelkl, Testa, & Major, 1991). When ambiguity is high, students may use their chronic trust, or lack of trust, to “go beyond the information given” (Bruner, 1957) and infer the motives of the evaluator. In some respects this process is similar to the one involved in the “hostile attributional bias.”

Children raised in aggressive contexts learn to expect hostility against them and thus interpret ambiguous provocations as intentional, which can trigger a negative cycle of retaliation and peer rejection (Dodge, 2006). Likewise, mistrust could arise from minority students’ growing awareness of the significance of race in school and society. This in turn could lead them to see bias as a possible factor motivating their teacher’s critical feedback. According to the present analysis, it is not the case that African Americans lack motivation in school. Rather they understandably may be uncertain as to whether they should invest their effort and identity in tasks where they could be subjected to biased treatment.

We conducted three double-blind randomized field experiments to test a method of fostering minority adolescents’ trust during feedback interactions. We sought to disabuse students of the possibility that they were being negatively stereotyped or discriminated against. We did so by encouraging students to attribute critical feedback to their teacher’s high standards and his or her belief in their potential to reach those standards (G. L. Cohen et al., 1999). We then examined the effects of this intervention on students’ trust and academic behavior. Our research builds off the recognition that social-psychological processes have a temporal dimension—that they do not end with the first outcome assessed but instead continue to unfold over time (G. L. Cohen & Garcia, 2008; Lewin, 1943; Yeager & Walton, 2011). Accordingly, we assess both short-term and long-term effects of our interventions, with attention to their impact on longitudinal trajectories.

The Development of Mistrust

We conducted this research with students from seventh to 10th grade because past research suggests this could be a time when minority adolescents start to draw conclusions about whether they can trust mainstream institutions like school. As children grow into adolescents, they are increasingly aware of widely held negative stereotypes about their group (McKown & Weinstein, 2003) and they become capable of generalizing from personal experiences with bias to assessments of the fairness of the social system as a whole (Brown & Bigler, 2005). This ability to question the fairness of a system or institution can lead to age-based differences in social perception. For instance, minority students in early adolescence see more evidence of racial bias in ambiguous provocations in school than minority students in the elementary school (Killen, 2012). By middle adolescence (seventh to 10th grade) many minority students have relatively stronger expectations of being treated unfairly by their teachers, compared with their expectations as elementary school children (e.g., Killen, Henning, Kelly, Crystal, & Ruck, 2007). As a consequence, we expected that during adolescence, when young people are formulating beliefs about the trustworthiness of institutions, interventions designed to repair trust might yield long-term benefits for minority students.

Wise Strategies to Lift a Barrier of Mistrust

How does an educator assuage minority students’ mistrust? By lessening the perceived role of bias as an explanation for criticisms. This requires “wise” strategies—strategies that convey to students that they will be neither treated nor judged in light of a negative stereotype but will instead be respected as an individual (G. L. Cohen & Steele, 2002; Goffman, 1963). *Wise* is used here

in the way originally formulated by Goffman (1963) in his analysis of social stigma: the act of seeing stigmatized individuals in their full humanity, which enables an openness and honesty when one interacts with them (Goffman, 1963).

Not all well-intentioned strategies are wise. For instance, educators often overpraise mediocre work (Brophy, 1981), especially the work of racial minorities (Biernat & Manis, 1994; Harber, 1998, 2004; Massey, Scott, & Dornbusch, 1975), in an effort to boost students' self-esteem (Brummelman et al., 2013), or to convey their lack of prejudice (Croft & Schmader, 2012; Harber et al., 2012; Harber, Stafford, & Kennedy, 2010). However, this type of feedback may fail to dispel the stereotype. If students perceive that praise conveys low expectations, then overpraising and attempts at self-esteem boosting may confirm rather than refute the suspicion that they are being stereotyped. Indeed, under certain circumstances, positive feedback from White evaluators can damage minority students' self-esteem (Lawrence, Crocker, & Blanton, 2011; Mendoza-Denton, Goldman-Flyth, Pietrzak, Downey, & Aceves, 2010). Hence, overpraising students does not seem to lessen mistrust and may even accelerate academic disengagement.

By contrast, wise practices credibly refute the stereotype. They use targeted and theoretically derived practices to disabuse students of the belief that they are being seen as limited or as not belonging (G. L. Cohen & Steele, 2002; G. L. Cohen et al., 1999). In theory, this can be accomplished in a feedback interaction through three steps. Critical feedback must be conveyed as a reflection of the teacher's high standards and not their bias. The student must be assured that he or she has the potential to reach these high standards, lessening the possibility that they are being viewed as limited. Students must also be provided with the resources, such as substantive feedback, to reach the standards demanded of them. These practices create a positive attributional space for students to interpret critical feedback, one that for them lessens the plausibility that the stereotype is driving their treatment. Stereotyped students can attribute the critical nature of the feedback to the instructor's high standards rather than racial bias, and they can rest assured that the instructor harbors no stereotype-based judgment of them. Further, provided with the instructional resources they need to improve, students will go on to refute the stereotype by reaching the higher standard. In contrast to stereotyped students, nonstereotyped students more readily attribute critical feedback to high standards and a belief in their potential even without these explicit explanations (G. L. Cohen et al., 1999). Because they are not under the specter of the stereotype, the meaning of the criticism is less ambiguous; the message that is implicit for nonstereotyped students may need to be explicit for the stereotyped student.

Research on educational practices supports this theoretical analysis. For instance, Bryk, Lee, and Holland (1993) demonstrated that in contrast to comparable urban public schools, urban Catholic schools dramatically reduced achievement gaps, even eliminating them in many cases. In part this was because the schools expected that every student—even low-income and minority students—would take and pass the most rigorous college preparatory classes. Teachers also provided a supportive community that reinforced the sentiment that all students could reach the standards being asked of them. Likewise, Uri Treisman's Emerging Scholars college calculus program (Treisman, 1992) imposed special, high-level calculus challenges that required repeated critical feedback from experts.

The program dramatically increased the proportion of African American students who passed college calculus and went on to graduate careers in mathematics. The program's success rested, in part, on its requirement that all students, including African American, White, and Asian students, do challenging problems and receive demanding feedback. In such a context, the racial stereotype would presumably come to be seen as an implausible explanation for their professor's critical feedback. Other successful programs and educators make similar use of an explicit invocation of high standards and assurance of students' potential to reach them. For example, there is the real-world success story of high school teacher Jaime Escalante. His consistent high standards and belief that his students could reach them motivated his low-income, predominantly Latino students to take and pass the advanced placement calculus exam, with many going on to attend college and have successful careers (Mathews, 1988, 2010).

Though suggestive, these cases do not definitively show that a psychologically wise method to assuage race-based mistrust is to explicitly invoke high standards and to communicate a belief in a student's potential to meet that higher standard. To our knowledge only one set of studies has experimentally isolated the effect of such wise practices. However, these have been conducted only in the laboratory. No published studies have assessed actual performance in field settings, and none has examined the role of trust in the effects of wise feedback (G. L. Cohen et al., 1999; see also G. L. Cohen & Steele, 2002).

Past laboratory studies examined minority college students' responses to a White critic's evaluation of an essay they had written. Researchers compared the wise strategy to an esteem-boosting "positive buffer" approach, in which the criticism was prefaced with praise but no mention was made of high standards or students' potential to reach them. As predicted, wise feedback reduced the extent to which African American students' suspected their critic of bias and benefited their self-reported motivation; as expected, White students were unaffected (G. L. Cohen et al., 1999). By contrast, the intuitive positive buffer condition did not improve African American students' responses to criticism compared to a no-buffer control condition.

Two additional studies showed that both high standards and personal assurance were necessary to improve negatively stereotyped students' responses to criticism. One study (G. L. Cohen et al., 1999, Study 2) provided students with critical feedback on their essays that either invoked high standards only or invoked those standards and further assured the students of their ability to reach them. Only the latter, fully wise condition improved motivation for minority students. Another study of critical feedback (G. L. Cohen, 1998, Study 3, reported in G. L. Cohen & Steele, 2002) included a condition that only assured students of their ability to "do better," without an invocation of high standards, and compared this to fully wise feedback and a no-buffer control. Again, stereotyped students benefited only from fully wise feedback. This evidence suggests that both high standards and personal assurance are necessary to take the stereotype "off the table" as an explanation for critical feedback. Although a demand for a high level of performance undermines the notion that feedback is motivated by bias, it does not allay the concern of confirming the stereotype if one fails to meet that demand. On the other hand, the assurance that one simply can do better risks sending the stereotype-threatening mes-

sage that one can bring one's performance from abject deficiency to mere mediocrity.

The present studies extend previous research in several ways. First, the present studies focus on performance, whereas past published research measured only immediate self-reported motivation to revise an essay. Moreover, the present studies take place in real-world classrooms rather than a laboratory. An important theoretical and applied question concerns whether similar processes involving trust affect meaningful behavior in a real-world situation that abounds with uncontrolled forces (Bronfenbrenner, 1979). Relatedly, the present studies focus on adolescents in public schools rather than undergraduates at elite institutions. College students have relatively high levels of academic aptitude. Merely being admitted to a selective institution may alleviate mistrust of the educational system. It is possible that creating trust is less challenging for such a population.

Finally, the present studies measure trust and examine its potential moderating impact, whereas past studies did not directly do so. How might school trust moderate the effects of wise feedback? In situations of ambiguity, prior beliefs—such as a belief in the trustworthiness of educators—can act like a cognitive filter. For African Americans, critical feedback tends to be more attributionally ambiguous (Crocker & Major, 1989), as it could plausibly be motivated by racial bias. By contrast, for White Americans, the feedback interaction is relatively less ambiguous, and leaves relatively less room for their prior beliefs to filter interpretations. A trust-creating intervention like wise feedback should thus be especially beneficial for low-trust students and even more so for low-trust minority students.

Recursive Processes in Social-Cognitive Development

Our longitudinal experimental approach is rooted in contemporary theories of social-cognitive development (Olson & Dweck, 2008). These theories propose that the effects of prior experiences on developmental outcomes are not always direct. Instead, effects can be indirect through their impact on mental representations that shape interpretations and guide behaviors in the present. As Lewin (1947) suggested, past experience matters insofar as it shapes the present psychological field. Minority students' prior encounters with discrimination and their awareness of the significance of race can affect their academic outcomes by influencing the way that they interpret ongoing school experiences. Insofar as they believe that race may affect trustworthiness of authority figures in school, they may have cause to doubt the benevolent intent behind critical feedback (Bryk & Schneider, 2002; see Olson & Dweck, 2008). A crucial premise of the present research and a corollary of this social-cognitive account is that one way to test whether past experience affects present interpretations is to experimentally sever the influence of past experience on mental representations of the present situation.

Building on this perspective, our research delivered a targeted psychological intervention to alter adolescents' mental representations, designed to weaken the degree to which their accumulated mistrust in school affected their interpretation of critical feedback. We expected the intervention to affect students' motivation to comply with the feedback and their long-term trust in school in Studies 1 and 2 and, in Study 3, their school grades. The notion that a targeted intervention could translate into long-term effects

on trust and achievement rests on the idea that recursive processes in school can strengthen and propagate intervention effects over time (G. L. Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009). Research on developmental cascades (Masten et al., 2005) and life-span models of human development (Almeida & Wong, 2009; Elder, 1998) emphasize the potential for recursive processes to exaggerate student outcomes over time. In the present case, a student who mistrusts teachers may interpret critical feedback as evidence of the very teacher bias he or she suspects and thus dismiss rather than incorporate the feedback. Finding confirmation of bias, the student may grow more mistrusting and, as a consequence, see bias even more than he or she had before, further strengthening mistrust, in a process that gains strength from its own repetition. However, the recursive nature of the process presents an opportunity. A well-timed intervention could deflect attributions of bias and thus interrupt the downward spiral of mistrust and lack of learning (G. L. Cohen et al., 2009). If a teacher disabuses a student of the relevance of a stereotype, student may perceive less bias, begin to trust more, and engage in more opportunities to learn. This would improve his or her trust further, triggering a virtuous circle or, more modestly, slowing a vicious one.

The Present Research

We conducted three longitudinal field experiments in middle school and high school classrooms. All studies featured experimental designs in which students were randomly assigned to condition and remained unaware of their involvement in an intervention and teachers were kept unaware of both students' condition assignments and the experimental hypotheses.

In Studies 1 and 2, White and African American students received critical feedback from their teacher on an essay they had written for class. This feedback was accompanied either by a placebo control note or by a wise feedback note designed to lessen mistrust by informing the students that their teacher held them to a high standard and believed in their ability to reach those standards. We examined the effect of the wise feedback message on whether students revised their essays (Study 1) and on the quality of their revised essays (Study 2) roughly 1 week later. Although we expected that all students might benefit somewhat from wise feedback (and hence we tested for main effects of condition), our focus was on whether wise feedback had effects primarily among students for whom trust was expected to be most uncertain and most influential—that is, African American students with chronically low levels of trust in school. We further tested whether the intervention lessened any downward trend in trust, evidence of a slowed or halted recursive cycle of deepening mistrust.

Study 3 proceeded from the notion that the feedback interaction recurs in school and as a consequence mistrust may trigger a recursive cycle of reciprocally reinforcing mistrust and poor performance. Hence, an intervention might produce lasting effects if it encouraged students to see critical feedback in general as an expression of their teachers' belief in their potential to reach a higher standard. Rather than alter the teacher's feedback, Study 3 focused on giving students agency in the attribution process. It assessed the effects of the intervention on students' overall grades.

Study 1

Method

Participants. Forty-four seventh-grade students in three social studies classrooms at a suburban public middle school in the northeast region of the United States provided assent and parental consent to participate in this study. The school was middle class and average achieving. Twenty-one percent of students in the school received free or reduced-price lunch. Eighty-three percent of seventh-grade students passed the state's standardized writing test in the year the study was conducted, similar to the state average of 81%. Crucially, nearly all the teachers in the school were White, allowing for tests of critical feedback delivery across racial lines. In addition, the present school mirrors the racial composition of teachers in the United States (84% of K–12 teachers are White, and only 7% are African American; National Center for Education Statistics, 2008).

Participants were from a mixed-ethnicity school, roughly evenly split between African American and White students. Equal numbers of African American and White students were recruited to participate. Twenty-two African American students and 22 White students were randomly assigned either to the wise feedback condition (criticism plus high standards and assurance) or to a control condition (criticism alone).

Fifty-three percent of participants were female, 47% male. Sixty percent were 12 years old, and 40% were 13 years old. Only students who had earned intermediate levels of achievement in the course (average grades of B and C) were eligible to participate. Virtually all the Black and White students who met this criterion participated. The rationale for this inclusion criterion concerned the need to make the wise feedback message credible. The wise feedback note, ostensibly from the students' own teachers, conveyed that the teacher had high expectations for the student and knew that the student could reach them. The note would risk seeming incongruous to A students if they submitted a strong initial draft and saw little room for improvement on their essay. Likewise, the note would risk seeming insincere to D or F students, as they would presumably suspect that their prior performance record did not give the teacher grounds to express a high expectation for them. In order to provide a clean test of the intervention, Studies 1 and 2 thus focused on students in the intermediate performance range. All other students took part in the main elements of the curriculum module used in the study, but they were not randomized to experimental condition.

Procedure.

Overview. The experiment took place in the spring of seventh grade, roughly 3 months before the school year ended. Baseline measures of trust in school were administered four times before the experiment: at the beginning, middle, and end of sixth grade and at the beginning of seventh grade. These four responses were averaged. As a postintervention-dependent measure, school trust was measured again roughly 2.5 months after the experiment.

Experimental procedures. Students wrote an essay about a personal hero in the context of a curriculum module designed in collaboration between the researchers and teachers. This topic was selected because it was expected to be engaging to students. Students then received critical feedback from their teacher on the first draft of their essay, accompanied by a randomly assigned

message. Students then had an opportunity to submit a revision, the key dependent measure. All the teachers involved in the study were White.

Students were unaware that the "hero" curriculum module was part of a research study. Researchers did not interact with students, and teachers did not inform students that the module activities were developed with researchers. Student assent and consent were obtained at the beginning of the school year and were dissociated from the research project. As noted, all students, including non-participants, participated in the curriculum module.

In the curriculum module, students and their social studies teachers spent several class periods converging on a definition of a hero, using classroom discussions and reference materials. Next, each student wrote a five-paragraph essay about their personal hero, which they completed over a few weeks, both in class and at home. Students were given a rubric that outlined the five expectations for the assignment: one introductory paragraph that defined three characteristics of a hero, three paragraphs constituting the body of the essay (one about each characteristic of their selected hero), and a concluding paragraph (curriculum materials are available upon request). In collaboration with the researchers, the teachers designed this rubric and a method for scoring students' essays. After students wrote their first drafts and submitted them, their teachers evaluated each essay along each of the five rubric dimensions using separate scales ranging from 0 (*not so good*) to 3 (*excellent*). When summed, these scores yielded a composite score ranging from 0 to 15 ($M = 6.62$, $SD = 3.23$). Although teachers recorded these scores, they did not give them to their students, as receiving a grade can lead students to disregard substantive comments (Black & Wiliam, 1998; Butler, 1988).

Teachers were instructed to provide written feedback on the essays as they would normally do, including both suggestions for improvement and any words of encouragement they would typically give. Researchers did not provide any guidance to teachers regarding the content of these critiques, except a general request to provide substantive and rigorous criticism (see Figure 1 for an example). On students' essays, teachers wrote questions and constructive suggestions related to how to clarify ideas in the paper (e.g., "How is a hero different from an 'idol'?"), how to buttress the evidence in support of an idea ("Tell a story, give an example" or "Be more specific"), how to improve the paper more generally (e.g., "This is good but needs more development"). These comments were frequently encouraging (e.g., "Very thoughtful paragraph" or "This is good"). The teachers also noted errors in spelling, punctuation, and grammar (an average of eight such corrections per paper, again with no differences by race or condition; $F_s < 1$). Thus, the curriculum module developed in conjunction with teachers took students through the stages of the writing process, from brainstorming on the general topic of a hero to writing a first draft, to receiving substantive feedback, to undertaking a revision.

Once teachers wrote criticism on students' first drafts, they provided the essays to the researchers. To deliver the experimental manipulation, the researchers appended a note to each essay. The teachers were not present for this stage of the study. Students were randomly assigned to receive one of two notes on their essay. In order to increase the verisimilitude of the notes and the impact of the intervention, each student's note had been handwritten by his or her teacher at an earlier session. Although each teacher had

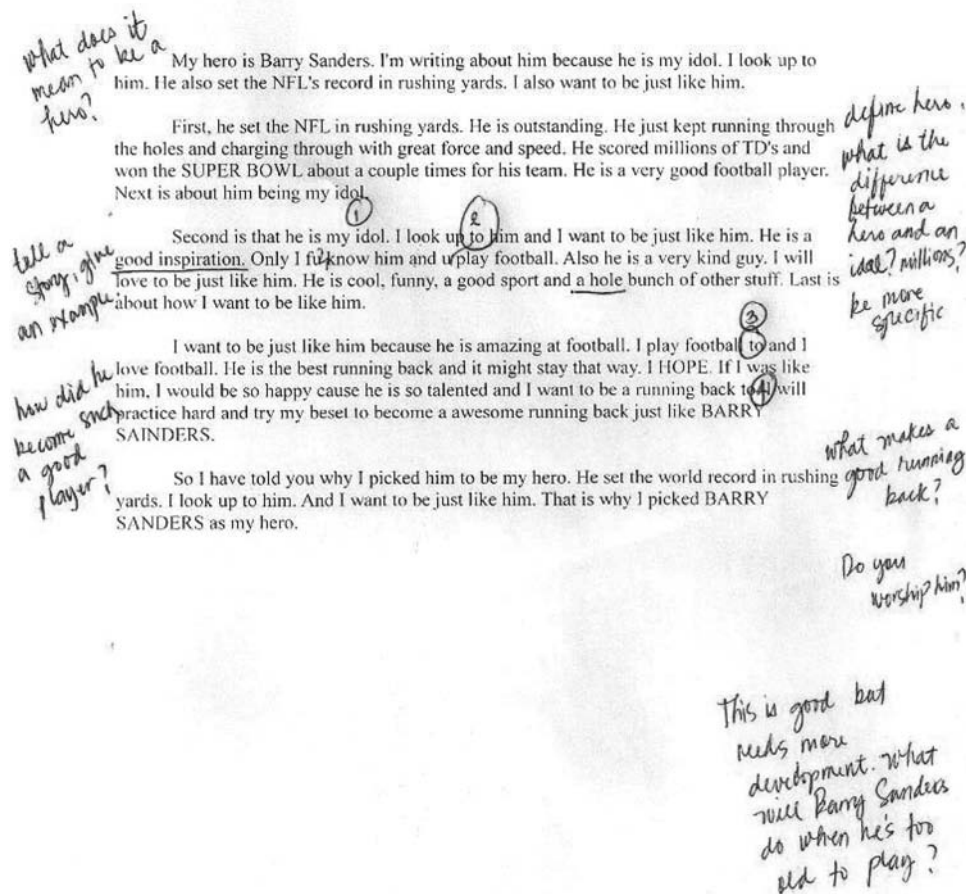
HERO PAPER

Figure 1. Sample student essay with teacher feedback, generated in Study 1 and used as experimental materials in Study 3.

written a set of control notes and a set of treatment notes, none was aware of which students would receive which note. The wise feedback treatment note stated, "I'm giving you these comments because I have very high expectations and I know that you can reach them." By contrast, the placebo control note stated, "I'm giving you these comments so that you'll have feedback on your paper." In all other respects, the notes were identical. Care was taken to select a placebo control message that was neutral but parallel. This was done by writing a note that was syntactically equivalent—that is, stating that comments are attached, followed by an explanation—and therefore fulfilling conversational expectations, consistent with best practices for placebo messages (see Langer, Blank, & Chanowitz, 1978). Students' essays were also photocopied so that they could be content analyzed.

Researchers then placed each essay, with its randomly assigned note, in a folder. The folder obstructed the experimental condition from teachers' view. Also included in the folders was a sheet of paper that resummarized the performance rubric so that students would be reminded of the key criteria for the essays. Each folder was affixed with the appropriate student's name, and then the set of folders associated with a specific class was given to the appropriate teacher for distribution to the students.

Students were given approximately 1 week to revise their essays. At that time, students either turned in a revised draft or did not, which was our key behavioral dependent variable. Fifty-nine percent did so.

Measures.

School trust. This measure assessed students' perceptions that school was fair for them and for members of their racial group. On the four baseline surveys and one postexperimental survey, students indicated how much they agreed or disagreed with six statements, such as "I am treated fairly by teachers and other adults at my school," "My teachers at my school have a fair and valid opinion of me," and "Students in my racial group are treated fairly by the teachers and other adults at [school name] Middle School" (1 = *very much disagree*; 6 = *very much agree*). At each time point, these items were averaged to create a single index of trust in school ($\alpha > .78$), with higher values corresponding to greater trust. Next, to create a baseline measure of chronic mistrust, all four preexperimental measurements were averaged ($\alpha = .80$). It was desirable to measure *chronic* mistrust through multiple preexperimental assessments because our social-cognitive account emphasized the importance of the mental representation that results from accumulated experience (Olson & Dweck, 2008). The

postexperimental, year-end measure of trust was analyzed independently as a longitudinal dependent variable (it was assessed, as noted, 2.5 months after the manipulation).

Results and Discussion

Effectiveness of random assignment. Random assignment was effective. In separate tests within the subsamples of African American and White students, there were no significant differences ($ps > .05$) between experimental conditions in terms of participant sex (African American students, $\chi^2(1) = 0.22, p = .34$; White students, $\chi^2(1) = 0, p = .34$); social studies teacher (African American students, $\chi^2(2) = 0.31, p = .86$; White students, $\chi^2(2) = 1.65, p = .44$); first draft scores (African American students, $t(20) = -0.26, p = .79$; White students, $t(20) = -1.57, p = .14$); first draft word count (African American students, $t(20) = -0.23, p = .82$; White students, $t(20) = -1.52, p = .15$); or preexperimental social studies grade (African American students, $t(20) = -0.29, p = .77$; White students, $t(20) = 0.25, p = .81$).

Analysis plan. The study featured a 2 (feedback condition: 0 = placebo control criticism, 1 = wise criticism; i.e., criticism plus high standards and assurance) $\times$ 2 (race: 0 = White, 1 = African American) design. We first conducted a logistic regression predicting essay revision (did revise vs. did not revise) with dummy variables for race, condition, and their interaction, plus covariates (see below). Significance tests were conducted by calculating the change in chi-square model fit when the focal variable was added to the model.¹

Although we present omnibus tests for condition in each analysis, our primary concern throughout the article centered on testing the effect of wise criticism among negatively stereotyped students—that is, African American students—as past research explicitly suggested that the intervention would benefit this group more (G. L. Cohen et al., 1999). Accordingly, after reporting omnibus tests, we performed a planned contrast testing the effect of experimental condition among African American students, with the expectation that the effect would be significant, and next tested the same contrast among White students, with the expectation that it would not be significant (for a review of this planned contrast approach, see Rosenthal & Rosnow, 2009). Additionally, because African American students in the control condition were the group expected to underperform most, we expected the contrast comparing African American students in the control condition with the three remaining cells to be significant, and we further expected that this contrast would explain a substantial proportion of the between-cell variability (i.e., that there would be no significant residual between-cell variance once this contrast was accounted for; for other studies using this procedure, see D. Cohen, Nisbett, Bowdle, & Schwarz, 1996; G. L. Cohen et al., 1999).

Throughout the article, unless otherwise noted, (a) no results were moderated by gender; (b) as is standard in experimental research on real-world educational outcomes (e.g., G. L. Cohen et al., 2009), relevant baseline control variables were included to increase the statistical power and precision of the model (in Studies 1 and 2, these were gender, first draft score, and social studies teacher [two dummy variables to code for three teachers], as inclusion of these reduced the standard error associated with the treatment effect); and (c) robust standard errors that corrected for

potential heteroscedasticity of error terms were calculated and used in statistical tests.

Did wise criticism increase motivation? In the full sample, students who received the treatment note, which emphasized their teacher's high standards and belief in their potential to reach those standards, proved more likely to revise their essays. The omnibus logistic regression yielded a significant effect of condition, unstandardized $b = 1.85, \chi^2(1) = 5.68, p = .017$, odds ratio (OR) = 4.60. Although the Feedback Condition $\times$ Race interaction was not significant, $b = 0.24, \chi^2(1) = 0.03, p = .87, OR = 1.11$, this was because of a nonsignificant positive effect of the wise criticism for White students. The relevant percentages are displayed in Figure 2A. Consistent with expectations, planned comparisons in the logistic regression model (Rosenthal & Rosnow, 2009) revealed that the significant main effect of wise criticism was limited to African American students. An estimated 71% of African American students who received the wise feedback note revised their essays, compared with 17% of students who received the control note, $b = 2.57, \chi^2(1) = 3.91, p = .045, OR = 11.95$ (values are covariate adjusted; raw percentages are 64% vs. 27%, respectively). Although White students also showed a trend in the same direction, this effect was not significant (covariate-adjusted values: 87% revised in the wise criticism condition vs. 62% in the control condition; raw percentages: 82% vs. 64%, respectively), $b = 1.30, \chi^2(1) = 1.72, p = .19, OR = 4.10$. A reasonable description of the data—and one consistent with our theoretical analysis—is that African American students who received the control note turned in fewer revisions than students in the remaining three cells. Indeed, a contrast testing this difference was significant, $b = -1.12, \chi^2(1) = 4.90, p = .03, OR = 0.25$, and left no significant residual between-cell variance (i.e., adding the two remaining orthogonal contrasts did not improve model fit), $\Delta\chi^2(2) = 2.65, p = .27$.

Trust: A moderating factor? We have suggested that wise criticism relaxes the mistrust that might otherwise filter students' interpretations of critical feedback. We therefore explored the possibility that wise feedback was most effective for students who chronically expressed low school trust at baseline and even more so for low-trust African Americans. Wise criticism should help to rule out the bias that low-trust African Americans might otherwise suspect when faced with critical feedback (G. L. Cohen et al., 1999).

To test for moderation by trust, we conducted logistic regressions predicting essay revisions with condition, baseline trust, their interaction, and the baseline covariates. However, with a small sample, a model that featured an interaction with a continuous variable and predictive covariates (e.g., first draft essay score) had the potential for "separation." This occurs when all observations within some combination of predictors have the same value (in this case, a 0 or a 1). Separation can prevent a model from converging (indeed, a standard logistic regression model failed to converge). Therefore, we employed Firth logistic regression (Firth, 1993), which is a penalized likelihood estimator that, in evaluations with small data sets, has emerged as the preferred solution (Heinze, 2006). Due to the statistical limitations posed by the modest

¹ Throughout the article, Cohen's d effect sizes were calculated by dividing the unstandardized regression coefficient for the treatment effect by the raw pooled standard deviation.

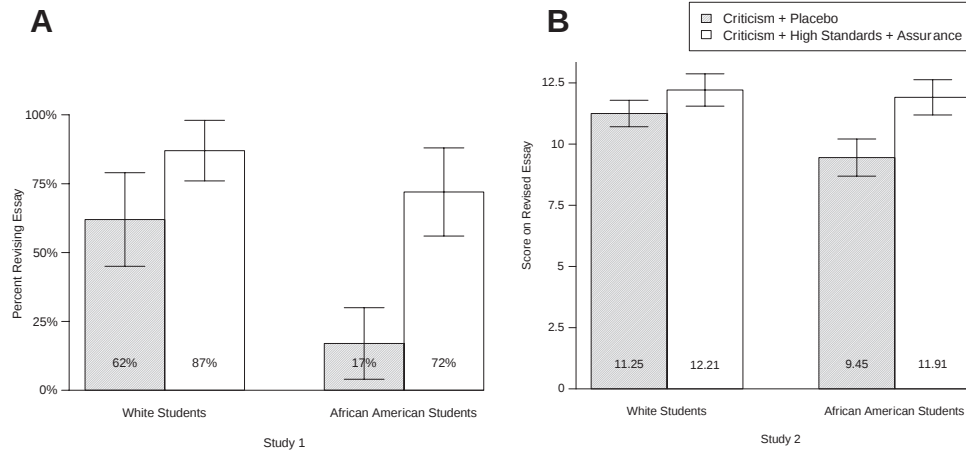


Figure 2. (A) Percent of students who revised their essays, by race and randomly assigned feedback condition (Study 1). (B) Final score on revised essay as graded by teachers, by race and randomly assigned feedback condition (Study 2). Values are covariate-adjusted means controlling for gender, teacher, and first draft scores (means estimated in separate regression models for African American and White students). Error bars: ± 1 standard error.

sample size and dichotomous outcome, we view these results as preliminary but potentially informative.

Was the wise feedback note most effective for students with chronically low levels of trust? It was, in this initial test. In a Fifth logistic regression predicting essay revisions, a Feedback Condition $\times$ Baseline School Trust interaction was significant, $b = 2.18$, $\chi^2(1) = 4.08$, $p = .043$, $OR = 3.57$.² Crucially, this interaction was significant only within the subsample of African American students, $b = -4.88$, $\chi^2(1) = 7.11$, $p = .008$, $OR = 7.11$. Although we tested the interaction using the continuous trust metric, to illustrate the effect we estimated values at 1 standard deviation above and below the mean for the baseline chronic trust score (for African Americans). Among low-trust African American students, 0% of untreated students revised their essays, whereas 82% of treated students did so. Among high-trust African American students, there was no significant treatment effect: Thirty-three percent revised their essay in the control condition versus 33% in the wise criticism condition. As expected, the Feedback Condition $\times$ Baseline School Trust interaction was not significant in the subsample of White students, $b = -0.03$, $\chi^2(1) = 0.00$, $p = .98$, $OR = 0.99$. The Feedback Condition $\times$ Baseline School Trust $\times$ Race interaction was marginally significant, $b = 4.76$, $\chi^2(1) = 3.21$, $p = .07$, $OR = 3.07$, as the Feedback Condition $\times$ Baseline School Trust interaction appeared stronger for African American than for White students.

In summary, this exploratory analysis suggested that wise criticism was especially effective for low-trust students and even more so for low-trust African Americans. This is promising support for our theoretical account. However, we view these results as tentative—in part because of the small sample size—so we conducted a replication and extension of them in Study 2.

Long-term intervention effects on trust? By improving the outcome of the feedback interaction for minority students, wise criticism might benefit minority students' trust in the long term. In particular, it might help low-trust minorities trust in their teachers. They may leave the feedback interaction feeling more confident in

their teacher's trustworthiness, and this may be further reinforced if they see their efforts at revision rewarded in the form of teacher approval. More modestly, wise criticism might prevent the decline in trust that would otherwise unfold in a recursive cycle, as low-trust African American students see evidence of bias in their teacher's feedback and then use this perceived bias as further evidence of their teachers' untrustworthiness.

Accordingly, we also conducted an exploratory analysis of long-term effects of wise criticism on year-end school trust, measured several months later. Again, we expected that African Americans participants with chronically low baseline trust would benefit most. In the full sample, there was no Baseline Trust $\times$ Feedback Condition interaction effect on year-end school trust, $b = -0.11$, $t(41) = -0.33$, $p = .74$, $d = 0.10$. However, the three-way Race $\times$ Baseline Trust $\times$ Feedback interaction was significant, $b = -1.37$, $t(41) = -2.78$, $p = .009$, $d = 0.85$, such that wise feedback increased year-end trust primarily among low-trust African American students. Among African American students there was a significant Baseline School Trust $\times$ Feedback interaction, $b = -1.31$, $t(19) = -2.32$, $p = .03$, $d = 0.99$. To illustrate this effect, we estimated the treatment effect among low-trust African American students. It was 0.79 standard deviations (wise criticism condition: $M = 3.30$; control: $M = 2.36$; simple effect, $t(19) = 2.54$, $p = .02$, $d = 1.18$), whereas among high-trust African American students wise criticism had no significant effect (wise criticism: $M = 4.93$; control condition: $M = 5.38$; simple effect, $t(21) = -1.23$, $p = .21$, $d = 0.59$). Among White students the two-way interaction was nonsignificant, $b = 0.61$, $t(21) = 1.47$, $p = .16$, $d = 0.64$.

Looking deeper into the data, we find that the intervention seemed to slow the decline in trust experienced by low-trust

² When testing interactions in this study and throughout the article (unless otherwise indicated), all variables are centered on 0 within the analytic sample, so that lower order interactions and main effects are interpretable.

African American students, consistent with the hypothesized recursive processes. We examined difference scores between baseline chronic trust and postexperimental trust. In the control condition, low-trust African American students experienced a steep decline in trust—a change of -1.56 points on the 6-point scale, $t(21) = 5.45, p < .001$. But low-trust African American students who received wise criticism showed a trust decline roughly half this size, -0.86 points, $t(21) = 5.35, p < .001$, and this difference in change scores was significant, $t(21) = 2.85, p = .01, d = 1.24$. Hence, wise feedback seemed to slow the tendency for early mistrust to beget deeper mistrust for minority students, consistent with an interruption of a recursive cycle. Combined, these exploratory analyses are in line with our theoretical claim that conveying high standards and assurance could alter such a recursive process and, if not repair minority students' trust, at least prevent further damage to it. Again, we view these findings as informative but preliminary and thus repeated these analyses in Study 2.

Summary. Study 1 showed that minority students' motivation increased when critical feedback from their teachers was accompanied with an invocation of high standards and a personal assurance of their ability to reach those standards. Moreover, Study 1 provides initial support that this intervention can slow a cycle of deepening mistrust of school among minority students.

Study 2

Overview

Study 1 demonstrated that accompanying criticism with an invocation of high standards and assurance of students' potential could encourage minority students to try to improve. But could it also affect the quality of their efforts to improve? In Study 1, it was not possible to evaluate condition effects on the quality of the revised essays because very few African American students in the control condition revised them. In Study 2 we altered the experimental procedures so that students were required to submit revised essays. We then conducted the same experiment in the same teachers' classrooms during the subsequent academic year with a new cohort of students. The key behavioral measures were students' scores on their revised essays and the number of teacher-supplied suggestions for improvement that they incorporated in their revision.

In Study 2, we also sought to strengthen our examination of the theoretical role of trust in minority students' responses to criticism. We sought to replicate the moderating role of trust in responses to wise feedback found in Study 1. The expectation in Study 2 was that low-trust African Americans would benefit most from wise criticism in terms of both revision quality and trust measured 2.5 months later, at the end of the year.

Method

Participants. A new cohort of 44 students from the same three seventh-grade social studies teachers' classrooms as Study 1, but from the subsequent year, provided assent and parental consent and participated in the study. Participants were 53% female, 47% male. Fifty-one percent were 12 years old, 49% 13 years old. As in Study 1, 22 African American students were assigned to treatment or control conditions, and 22 White students were assigned to

each condition, and only students at the middle levels of achievement (B and C averages) were recruited.

Procedure. At the beginning and end of sixth grade and at the beginning and end of seventh grade, students completed a survey that assessed trust in school. As in Study 1, in the spring of seventh grade, students completed our hero module, and they were randomly assigned to receive either a wise criticism note on their corrected first draft hero essays (a note emphasizing high standards plus assurance) or the placebo note (control condition) using the same procedure described in the previous study. In this study students were required by teachers to turn in second drafts of their essays, and 79% did so (revision rate did not differ by condition, $\chi^2(1) = 1.26, p = .26$).

Students' first and final drafts were collected and coded by researchers. To do so, after teachers had commented on students' first draft essays, but before they were redistributed to students, researchers photocopied the first drafts and returned them to the teachers. Likewise, after students' second draft essays were submitted, but before they were graded and returned to students, the revised essays were photocopied.

Measures

School trust. School trust was measured three times before the experiment (at the beginning and end of sixth grade and again at the beginning of seventh grade) and afterward (at the end of the school year, 2.5 months after the experiment). Survey procedures in Study 2 differed from those in Study 1 in only one respect—three rather than four preexperimental surveys were administered due to practical constraints. At each measurement occasion, the six items were averaged to create a single index of school trust ($\alpha > .78$), with higher values corresponding to greater trust. As a measure of chronic baseline school trust, scores from the three preexperimental measurement occasions were averaged ($\alpha = .82$). The postexperimental assessment of trust was analyzed as a longitudinal dependent measure. All White students provided survey data, but survey data were missing from two African American students due to school absences.

Quality of essays. First draft and revised essays were graded by teachers using a rubric almost identical to the one used in Study 1 (minor clarifications were made to the descriptions of the criteria on the rubric). Essays were again scored from 0 to 3 on each of five dimensions (the introduction, each of the three body paragraphs, and the conclusion). This process yielded a score that ranged from 0 to 15 for both drafts (first draft, $M = 7.60, SD = 2.81$; revised draft, $M = 11.1, SD = 2.48$).

Teachers were aware of students' identities but not condition assignments when grading, and so their knowledge of students' past performance may have influenced the scores they gave to students. However, this would not lead to a bias in condition effects because teachers were unaware of experimental condition. Nevertheless, we sought to create a second measure of the quality of the essays free of this influence. Independent coders, unaware of students' name, race, experimental condition, and first draft score, graded the first draft and revised essays. These coders had an average of five years' experience teaching middle school and either had earned or were earning a master's degree. Coders assigned a score from 0 to 3 for each of the five rubric dimensions. This yielded two scores for each student for each draft (Krippendorff's alpha for the two coders = .71), which were then averaged (first draft, $M = 8.30, SD = 2.35$; revised drafts, $M = 9.18, SD =$

2.61) and used in a supplementary analysis (one student's essays were not provided by the teachers to photocopy and code, so the teacher-graded scores were substituted).

Number of edits corrected. Trained research assistants, unaware of condition and experimental hypothesis, counted the number of edits teachers made on students' first drafts and the number of suggestions successfully incorporated by students on their revised drafts (Krippendorff's alpha for the two coders = .80). Three students were outliers and made a very large number of editorial changes—more than 17, including one student in the experimental condition (who made the largest number of edits) and two in the control condition. To prevent these scores from exerting a disproportionate impact on analyses (and overstating treatment effects), they were recoded to the next most extreme score, which was 11 edits (recoded, $M = 3.66$, $SD = 3.87$; range: 0–11; all statistically significant effects involving this measure remained significant when the original values were retained).

Results and Discussion

Effectiveness of random assignment. Random assignment was effective. In separate tests within the subsamples of African American students and White students, there were no significant differences between experimental conditions in terms of participant sex (African American students, $\chi^2(1) = 0.73$, $p = .39$; White students, $\chi^2(1) = 0.20$, $p = .65$), social studies teacher (African American students, $\chi^2(2) = 1.17$, $p = .28$; White students, $\chi^2(2) = 0.96$, $p = .33$), first draft scores (African American students, $t(20) = 1.46$, $p = .16$; White students, $t(20) = -0.89$, $p = .38$), first draft word count (African American students, $t(20) = 0.44$, $p = .66$; White students, $t(20) = 0.96$, $p = .35$), and preexperimental social studies grade (African American students, $t(20) = 0.09$, $p = .93$; White students, $t(20) = 1.42$, $p = .17$).

Analytic plan. As before, the study featured a 2 (feedback condition: 0 = placebo control criticism, 1 = wise criticism; i.e., criticism plus high standards and assurance) $\times$ 2 (race: 0 = White, 1 = African American) design. We first restricted our analyses to the subset of students who revised their essays ($n = 35$). We also report supplementary analyses that used imputed values for students who did not revise their essays (total sample, $n = 44$). The same covariates used in Study 1 were again used here (gender, first draft scores, teacher), to more precisely replicate Study 1. As in Study 1, we present omnibus tests but expected to find our predicted effects primarily among African American students.

Did communicating high standards and assurance lead to stronger revisions?

Primary analysis. The teacher's high standards and assurance message led students to earn significantly higher scores on their revised essays, as graded by their teachers. As in Study 1, the omnibus test yielded a main effect of wise criticism, unstandardized $b = 1.39$, $t(34) = 2.19$, $p = .02$, $d = 0.59$. Although the Feedback Condition $\times$ Race interaction was not significant, $b = 0.47$, $t(34) = 0.32$, $p = .75$, $d = 0.11$, again this was because of a positive but nonsignificant effect of the wise criticism on White students. The relevant means are displayed in Figure 2B. Consistent with our theory, a planned contrast (Rosenthal & Rosnow, 2009) found the main effect of wise criticism was significant among African American students (covariate-adjusted means: wise criticism condition, $M = 11.91$, $SD = 1.77$; control, $M = 9.45$, $SD = 3.31$; raw means: 11.50 vs. 9.33, respectively), $b =$

2.46, $t(16) = 2.52$, $p = .03$, $d = 0.97$. Although White students trended toward turning in better essays when they received wise criticism, the effect was not significant (covariate-adjusted means: wise criticism condition, $M = 12.21$, $SD = 2.03$; control, $M = 11.25$, $SD = 1.86$; raw means: 12.13 vs. 11.55, respectively), $b = 0.96$, $t(17) = 1.28$, $p = .22$, $d = 0.49$. Again, in line with our theoretical analysis, African American students who received the placebo control note had lower performance than all other cells, with the contrast reaching significance, $b = -1.96$, $t(34) = -2.36$, $p = .02$, $d = 0.83$, and leaving no significant residual between-cell variance, $F(2, 27) = 1.22$, $p = .31$. This analysis replicates the findings of Study 1 in showing that the effect of the wise criticism was strong and significant for African American students, but not significant for White students.

Improvement of essays. To more directly assess condition effects on improvement of the essays and to produce findings that more precisely replicate those reported in Study 1, we created a dichotomous variable indicating whether students' revised essay scores were higher than their first draft scores (1 = essay score improved, 0 = essay score did not improve). Thirty-four percent of African American students in the control condition improved their essay, compared with 88% of African American students in the wise criticism condition—a significant difference in a logistic regression, $\chi^2(1) = 4.56$, $p = .03$, $OR = 14.23$ (numbers are raw percentages). For White students, the figures were 80% and 100%, respectively, nearly but not quite a significant difference, $\chi^2(1) = 2.55$, $p = .11$ (in the full sample, there was a significant main effect of condition, $\chi^2(1) = 6.82$, $p = .009$, $OR = 36.81$). As above, the contrast comparing African American students in the control to all other cells was highly significant, $\chi^2(1) = 7.92$, $p = .004$, $OR = 15.70$, and left no residual between-cell variance, $\Delta\chi^2(2) = 2.56$, $p = .28$.

Multiple imputation. We multiply-imputed revised essay scores for students who did not turn in a revised draft using standard multiple imputation software, Amelia II (King, Honaker, Joseph, & Scheve, 2001), to randomly generate 50 estimated revised draft scores for the nine students who were missing data. The imputation was based on students' race, gender, teacher, preexperimental trust, and preexperimental grades (no postexperimental variables and no additional variables). We then used the software to statistically combine these generated scores to produce an estimated effect of the manipulation in the full sample of 44 students. This procedure allows inclusion of information from all participants without artificially inflating statistical power, because it adds error variance proportional to the uncertainty around the imputed value to the standard errors associated with the coefficients of interest. When this was done, the effect of wise criticism in the full sample continued to be significant, $b = 1.70$, $t(42) = 2.34$, $p = .02$, $d = 0.83$, and again this result was driven by African American students, $b = 2.13$, $t(20) = 2.14$, $p = .04$, $d = 0.93$, not White students, $b = 1.17$, $t(20) = 1.51$, $p = .15$, $d = 0.63$.

Essay scores of independent coders. When analyzing essay scores produced from independent coders, rather than the teachers, African American students who received wise criticism again were found to earn higher scores, $b = 1.93$, $t(16) = 2.30$, $p = .04$, $d = 1.15$, with no condition effect on White students' scores, $b = 0.15$, $t(17) = 0.11$, $p = .91$, $d = 0.05$. Thus, intervention-treated African American students produced essays that were not only graded as stronger by

their teachers (who, as noted, were unaware of their condition assignment) but evaluated as stronger by independent coders.

Number of edits corrected. Students who received the wise criticism note communicating high standards and assurance made more editorial changes in response to their teacher's comments than students who received the placebo control note. This analysis controlled for number of errors pointed out on the first draft and, also, first draft word count—neither of which differed by condition—because more editorial changes were made when the initial drafts contained more errors and were longer. Overall, students in the wise criticism condition made more than twice as many corrections as students in the control condition (5.54 vs. 2.19, respectively, covariate adjusted; raw means: 4.93 vs. 2.58, respectively), $b = 3.35$, $t(34) = 3.38$, $p = .002$, $d = 0.90$. In this case, the condition effect was significant for African American and White students alike (African American, $b = 3.60$, $t(16) = 2.36$, $p = .03$, $d = 1.18$; White, $b = 4.71$, $t(17) = 2.94$, $p = .009$, $d = 1.43$).

Trust: A moderating factor? We next sought to replicate the theoretically predicted finding from Study 1 that wise criticism would be most beneficial for low-trust students, particularly low-trust African Americans. In the full sample, we found the predicted interaction effect of condition and school trust on revised essay quality, such that wise criticism improved essay scores among students who had lower chronic levels of trust: Feedback Condition $\times$ Baseline School Trust interaction, $b = -1.46$, $t(34) = 2.29$, $p = .03$, $d = 0.77$. However, as Figure 3 shows, this was driven entirely by African American students. Among African American students, the Feedback Condition $\times$ Baseline School Trust interaction was significant, $b = -2.72$, $t(15) = -2.39$, $p = .03$, $d = 1.22$, whereas among White students it was not, $b = 1.60$, $t(17) = 0.78$, $p = .45$, $d = 0.37$. The three-way Feedback Condition $\times$ Baseline School Trust $\times$ Race interaction was significant, $b = -4.33$, $t(34) = 2.09$, $p = .046$, $d = 0.70$.

The condition effect on essay quality was largest among low-trust African American students, as in Study 1. Low-trust African American students (estimated at 1 standard deviation below the average trust score for African Americans) wrote better essays in the wise criticism condition than in the control condition (wise criticism covariate adjusted: $M = 10.92$; control: $M = 6.88$; simple effect, $t(15) = 3.06$, $p = .002$, $d = 1.59$), whereas there was no effect among high-trust African American students (estimated at 1 standard deviation above the average trust score for African Americans; high standards and assurance: $M = 11.87$; control: $M = 12.12$; simple effect, $t(15) = -0.20$, $p = .86$, $d = 0.09$).

Stated differently, wise feedback severed the relationship between chronic mistrust and performance, as predicted by our social-cognitive account (Olson & Dweck, 2008). As shown in Figure 3, among African American students in the control condition, chronic baseline trust strongly predicted revision quality (African American students: $r = .79$, $p < .001$). However, for African American students in the wise criticism condition, the correlation between trust and revision quality was eliminated, such that low baseline trust no longer predicted poorer revisions (African American students: $r = .06$, $p = .81$). Baseline trust did not predict essay quality for White students in either condition (wise criticism, $r = -.32$, $p = .40$; control, $r = -.12$, $p = .94$). Overall, Study 2 provided a reassuring

replication of Study 1's preliminary findings regarding moderation by trust.

As expected, chronic trust predicted essay scores only after students received critical feedback. There was no relationship between trust and baseline essay scores among African American students ($r = .06$, $p = .78$).³ After criticism, however, trust proved strongly predictive of African American students' scores in the control condition, as noted. This pattern supports the social-cognitive notion that mistrust undermines motivation by filtering students' interpretation of interpersonal treatment, not by undermining their general engagement with academic work.

Long-term intervention effects on trust? The wise criticism note increased performance the most for low-trust African American students, but did it also improve school trust 2.5 months after the experiment, as in Study 1? As shown in Figure 4, it did. In the full sample, we found the predicted Feedback Condition $\times$ Baseline School Trust interaction effect on year-end school trust, such that wise criticism increased school trust among those who had low levels at baseline, $b = -0.71$, $t(41) = -3.43$, $p = .001$, $d = 1.10$. As expected, this interaction was significant only among African American students: Feedback Condition $\times$ Baseline School Trust interaction, $b = -0.99$, $t(19) = -2.89$, $p = .009$, $d = 1.31$. Among White students the interaction trended (nonsignificantly) in the same direction, $b = -0.20$, $t(21) = -0.81$, $p = .42$, $d = 0.37$. As a result, the Race $\times$ Baseline School Trust $\times$ Feedback interaction was only marginally significant, $b = -0.79$, $t(41) = 1.85$, $p = .07$, $d = 0.57$, though this marginal result should not obscure the significant two-way interaction between baseline trust and condition.

In illustrating this effect, among low-trust African American students wise criticism increased year-end trust by 1.46 standard deviations (wise criticism covariate adjusted: $M = 4.54$; control: $M = 3.27$; simple effect, $t(19) = 4.06$, $p < .001$). Yet the wise feedback note had no significant effect among high-trust African American students (wise criticism: $M = 3.81$; control: $M = 4.11$; simple effect, $t(19) = -0.59$, $p = .56$, $d = 0.27$).

As in Study 1, we analyzed longitudinal changes in trust and again found that the intervention operated by slowing the decline in trust experienced by chronically low-trust African American students, consistent with a recursive process (G. L. Cohen et al., 2009). Among lower trust African American students in the control condition, there was again a steep decline in trust from baseline to the end of seventh grade, $b = -0.93$, $t(19) = -3.03$, $p = .003$, $d = 1.53$. For low-trust African American students in the high standards and assurance condition, however, there was a slight but nonsignificant increase in trust, $b = 0.13$, $t(19) = 0.47$, $p = .69$, $d = 0.18$. Hence, low-trust African American experienced less of a drop in trust in the wise criticism condition than in the control condition; a regression analysis of the difference score yielded $b = 1.06$, $t(19) = 2.41$, $p = .03$, $d = 1.05$. Together with Study 1's findings, these results buttress our theoretical claim that conveying high standards and assurance can improve performance and prevent mistrust from deepening.

³ This same correlation with baseline essay score was nonsignificant in Study 1 as well ($r = .08$, $p = .70$).

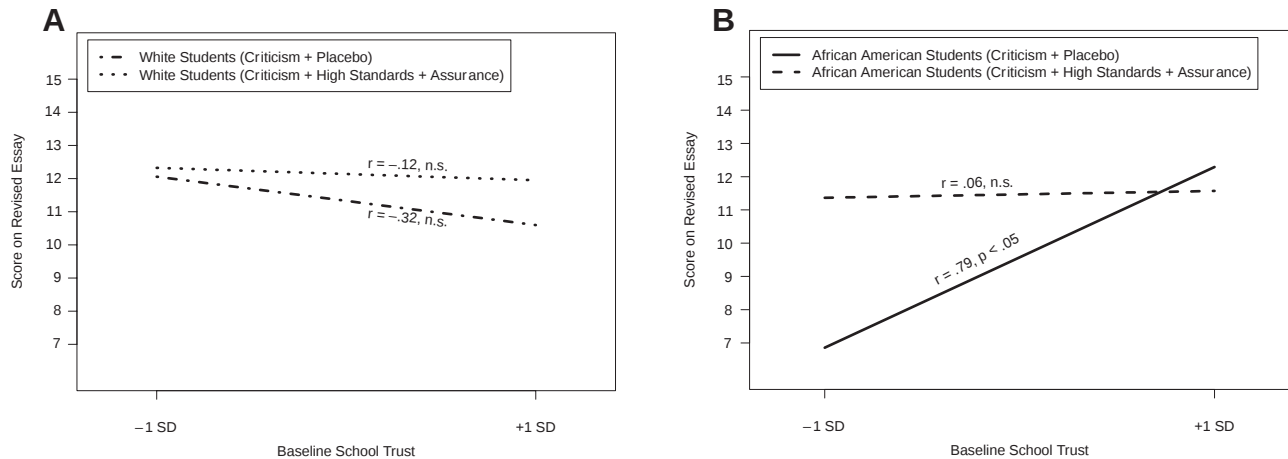


Figure 3. Revised essay scores in Study 2, by trust and feedback condition, for White students (A) and African American students (B). Values are covariate-adjusted estimated means at ± 1 standard deviation below and above the mean of baseline school trust (within racial groups).

Study 3

Overview

Studies 1 and 2 manipulated whether teachers' criticism explicitly conveyed to students that it reflected the application of high standards and a belief in students' potential to reach those standards. Doing so permitted African American students to benefit from those teachers' critical feedback. More treated students undertook revision (Study 1) and improved their work (Study 2). Wise criticism was designed to disabuse African American students of the relevance of the stereotype, so that they no longer saw criticism in light of long-standing suspicions of teacher bias. The finding in Studies 1 and 2 that the intervention severed the correlation between chronic mistrust and performance supports the notion that wise feedback can indeed do this. Though benefiting students on the whole, the effects of wise feedback were greatest among African American students with low trust in school.

The effects of mistrust can be recursive. Mistrust may lead to suspicions of bias in feedback, and those suspicions of bias may in turn reinforce mistrust, in a repeating cycle. Consistent with this

notion, in the absence of wise feedback, mistrust grew among low-trust African American students. However, the intervention appeared to interrupt this cycle. It led low-trust African American students to benefit from feedback and prevented their mistrust from deepening, as assessed 2.5 months later.

In the present study, as in Studies 1 and 2, we sought to encourage students to attribute critical feedback to their teachers' high standards and belief in their potential. Unlike in Studies 1 and 2, which did this by altering the messages given by teachers to students, in Study 3 we intervened more directly on the social cognitions predicted by theory to shape behavior: attributions for the causes of teachers' critical feedback. In doing so, we hoped to isolate the subjective psychological processes thought to underlie the effects observed in Studies 1 and 2.

Study 3 was informed by research on *attributional retraining*, a method of helping people to draw more constructive conclusions about the causes of their successes and failures. Beginning with Wilson and Linville (1982), research has shown that brief attributional retraining interventions can have lasting benefits for academic performance months or even years after the intervention

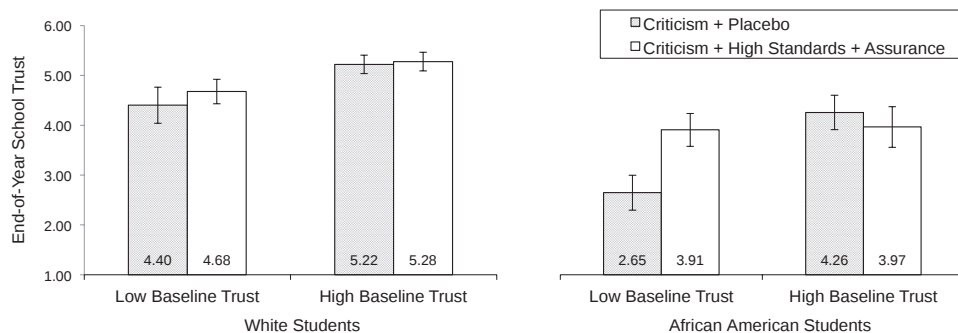


Figure 4. Effect of accompanying criticism with high standards and assurance on end-of-year school trust (2.5 months postexperiment), by race and baseline school trust in Study 2. Values are estimated means at ± 1 standard deviation below and above the mean of baseline school trust (within racial groups). Error bars: ± 1 standard error.

(see also Haynes, Perry, Stupnisky, & Daniels, 2009; Walton & Cohen, 2011; cf. Blackwell, Trzesniewski, & Dweck, 2007; Good, Aronson, & Inzlicht, 2003; for reviews, see Garcia & Cohen, 2012; Wilson, Damiani, & Shelton, 2002; Yeager & Walton, 2011). By directly targeting attributional tendencies, in Study 3 we sought to inculcate in students a “cognitive context” that they could take with them into multiple encounters with critical feedback, allowing for an examination on more global behavioral patterns, as indexed by overall grades.

With this methodology, the intervention in Study 3 was also suitable for students across the performance spectrum, not just the moderate-performing students featured in Studies 1 and 2. Could an intervention encourage even failing students to see criticism as a motivating sign of the teacher’s high expectations?

In contrast to Studies 1 and 2, which focused on a suburban middle school, Study 3 focused on an urban school with predominantly low-income students. Whether social-cognitive interventions can improve academic outcomes among students facing socioeconomic barriers has been largely unaddressed (for other exceptions, see Blackwell et al., 2007; Sherman et al., 2013, Study 1).

Method

Participants. Participants were 76 students at a medium-sized urban public high school in New York City. They were evenly split by gender: Forty-two percent of participants were female, 58% male. They were mostly (75%) in 10th grade: Nine percent were 14 years old, 50% were 15 years old, 17% were 16 years old, 20% were 17 years old, and 5% were 18 years old. They were largely racial minority and low income: Fifty participants self-identified as Black or African American, and 26 self-identified as White, but nearly all (95%) of participants lived in households below the median income for the state of New York, and 21% lived below the poverty line. As in the previous studies, the large majority of teachers in the school were White, mirroring the teaching force of the nation as a whole (and low-income schools in particular; National Center for Education Statistics, 2008).

Procedure. The study took place during the fall semester, a few days after the first of three 6-week marking periods. Students completed the study via an online interface that they logged into on either of 2 days of their computer class. The online activity took 15–20 min and was completed during a single session. Random assignment occurred via the computer so that research assistants administering the intervention did not know students’ experimental condition. Instructors in academic subjects were unaware that an intervention had taken place and unaware of students’ condition assignments. At the end of the survey, students were thanked for contributing to the research and were not contacted again.⁴

Intervention. Participants were randomly assigned to one of three conditions: a high standards and assurance intervention condition (wise criticism group), a placebo control condition (placebo control group), or a second control condition that had participants complete only puzzles (puzzles control group).

The experimental intervention consisted of three vivid testimonies ostensibly from a diverse group of older students at the students’ school. Each of the testimonies underscored the notion that teacher criticism reflects a belief in students’ potential to meet a higher standard. These testimonies were crafted to be brief but

powerful using social-psychological principles applied in past interventions (Heath & Heath, 2007). For instance, each testimony was accompanied with a photograph of a “student like you” who purportedly made the statement. This was done so that the testimonials would not simply express student opinion but establish a norm about how fellow students interpreted criticism (Cialdini, 2003). Additionally, the adolescents pictured as the sources of the testimonials represented a diverse range of ethnic groups. This was done to convey that the testimonials reflected not the particular view of one ethnic group at their school but the general views of fellow classmates (for a related procedure, see Walton & Cohen, 2011). To drive home the message of the intervention, each testimony made a focused point and used concrete analogies, many drawn from sports (Heath & Heath, 2007).

The peer testimonials encouraged students to attribute academic criticism to teachers’ high standards and belief in their ability to reach those standards (e.g., one ostensible upperclassman stated, “I’ve come to learn that criticism doesn’t mean my teacher sees me as dumb. It means they think their students can reach that high standard”). Excerpts of the three testimonials used in the wise criticism condition are provided in Table 1. Each testimonial was shown on a different screen and accompanied with a photograph of its ostensible student source. To convey the consensual nature of the message across diverse student groups, the putative student authors included two African American, two Asian, and two Hispanic/Latino students. Half were male, half female. Student photographs were randomly assigned to one of the three quotes, and the order of the quotes was counterbalanced.

In the placebo control condition, all features of the experience were identical except that students read three placebo testimonials (cf. Langer et al., 1978), again ostensibly made by the photographed students. For instance, one control condition testimonial read, “I guess [teachers] write comments just so I can have feedback on my essay.” In the puzzles control condition, students only completed three pages of moderately challenging puzzles and saw no photographed students or testimonials.

To facilitate students’ internalization of the intervention message, they practiced the new attributions in response to an imagined experience of critical feedback. After reading the quotes or completing the puzzles, participants in all three conditions were asked to provide their own interpretations of teacher feedback on a student essay. They viewed a student’s essay, which had critical feedback written on it in red ink and was ostensibly provided by a teacher pictured above the essay. Upon being shown the image of the essay, participants were asked to “imagine that this was your essay” and “that your teacher wrote these comments on your essay.” Students viewed one essay, randomly assigned from a pool of six potential essays. In fact, this pool of essays consisted of a sample of anonymized first draft essays written by participants in Studies 1 and 2 (see Figure 1 for an example). The ostensible teacher, pictured above the essay, was White in order to mirror the school setting and more generally the cross-race mentoring context that most minority students encounter in U.S. public schools

⁴ We would have liked to measure trust, but could not do so because the school was unable to provide extra class time for this component of the research. Due to a change in the school administration, we were also unable to follow up with our students beyond the period of observation featured here.

Table 1

Examples of Student Testimonials Used in Study 3's High Standards and Assurance Intervention

Example 1	Teachers give critical feedback, sometimes a lot of it, to students that they believe in. It's a hard lesson. But I've come to learn that criticism doesn't mean my teacher sees me as dumb. It means they think their students can reach that high standard.
Example 2	Sometimes people think that all the red ink on your paper happens for some other reason, like maybe the teacher is biased. But think of pro athletes or baseball teams that make it to the World Series. Just like in sports, you need that critical feedback to get excellent.
Example 3	The teachers who give me feedback that corrects my mistakes are the ones who really care. They take you seriously, like a good coach does. You might not get good criticism like that all the time in school. But when you do get it, it's like gold.

(National Center for Education Statistics, 2008). The image was randomly assigned from a pool of five potential teacher images—three females and two males of varying age and attractiveness. More female than male teacher faces were used because more teachers at the school site were female than male, again mirroring the demographic context of the U.S. public school system (National Center for Education Statistics, 2008). A pool of several potential essays and teacher images were used in order to avoid confounding results with idiosyncratic features of the essays, comments, or appearance and gender of the teacher. (In supplemental analyses, randomly assigned essay and teacher images were not associated with any outcomes either as main effects or interactions with condition and race, so these factors are not discussed further.) In the context of this simulation, students completed a manipulation check assessing the extent to which they ascribed the hypothetical feedback to the teacher's high standards and belief in their potential to reach them. Finally, participants were thanked for their time and returned to class.

Measures.

Manipulation check. After viewing the critiqued essay and imagining they had written it and received the presented feedback, students indicated how much they agreed or disagreed with two statements: "The teacher who gave this feedback has high standards" and "The teacher who gave this feedback believes in my ability to reach a higher standard" (1 = *very much disagree*; 6 = *very much agree*). These ratings were internally consistent ($r = .85$). In our manipulation we sought to promote the perception that teacher criticism was motivated by the combination of high standards and belief in students' ability to reach them. Accordingly, the two items were multiplied to create a single index (virtually identical results were obtained when the items were averaged instead). To ease interpretation, the measure was linearly transformed to the original 1–6 metric, with higher values representing more wise attributions.

Grades. We obtained students' official grades for the first semester of the year from school records. The semester encompassed three marking periods, each approximately 6 weeks in duration. Grades for a given marking period fell on a 100-point scale in each of four core subjects (math, science, English, and history; observed range: 46–100). The intervention took place 1 week after the end of the first marking period. The first marking period thus provided a baseline measure of performance, and the second and third marking periods provided postintervention measures of performance. The grades in the four core classes in each marking period were averaged ($\alpha > .80$; although we wanted to continue following students to assess longer-term impact, subsequent grades were unavailable). Because all grades were cumulative, grades in each marking period reflect not only performance

within that period but the cumulative average from the preceding periods. Accordingly, in all analyses of postintervention performance, preintervention grades (i.e., performance in Marking Period 1) were controlled.

Control variables. Unlike Studies 1 and 2, which involved more homogeneous (in terms of class and achievement) middle-class students, the present study involved students from a wider range of socioeconomic status (SES) and achievement levels, as is typical of large urban public high schools. Therefore additional covariates were chosen a priori to control more completely for prior differences in achievement and obtain more precise estimates of the treatment effect. These covariates also helped to rule out alternative hypotheses that correlates of race—achievement and SES—drove treatment effects. We obtained Grade 8 (preintervention) standardized test scores in four core subjects (math, science, English, and history; range: 1–10) and averaged them ($\alpha = .88$). Next, SES is typically defined as a combination of education and income and has in past research predicted student achievement (Sirin, 2005). We calculated the average of both the percentage of people in the student's ZIP code with a college degree and the percentage living below the poverty line, according to the U.S. census (subtracted from 100), with higher levels corresponding to higher SES. When values were not available, they were imputed. These control variables were included as covariates in the omnibus regression models and in the models conducted within racial subgroups. They reduced standard errors associated with treatment effects, thus increasing analytic precision and power (omitting these two control variables does not affect the significance level of the treatment effect on grades).

Results and Discussion

Effectiveness of random assignment. Random assignment was effective. In separate analyses of variance among African American students and White students, there were no significant differences between experimental conditions in terms of first marking period (preintervention) grades (African American students, $F(2, 49) = 0.13, p = .88$; White students, $F(2, 25) = 1.13, p = .34$), or standardized test scores (African American students, $F(2, 49) = 0.36, p = .70$; White students, $F(2, 25) = 0.09, p = .91$). There were also no baseline differences between conditions in terms of participant sex (African American students, $\chi^2(2) = 2.63, p = .27$; White students, $\chi^2(2) = 3.56, p = .17$), or grade level (African American students, $\chi^2(6) = 5.59, p = .47$; White students, $\chi^2(6) = 2.25, p = .90$).

Analytic plan. The study was a 2 (feedback condition: 0 = control, 1 = wise criticism) $\times$ 2 (race: 0 = White, 1 = African American) design. The placebo interpretation control group and

the puzzles control group did not significantly differ from each other on any dependent measure ($t_s < |1|$), so the control groups were combined into a single control group in all analyses. Regression analyses were conducted throughout, with the control variables included as covariates. Both raw and covariate-adjusted means are provided for focal analyses.

As in Studies 1 and 2, the focus rested on whether the intervention would benefit African American students and not White students. We therefore conducted planned comparisons within each of the two racial groups. As in Studies 1 and 2, we assessed whether the contrast between African American students in the control condition and all other cells accounted for a large proportion of the between-cell variability. We also present the omnibus test of condition.

Manipulation check. As expected, when African American students viewed the heavily edited essay—and were asked to imagine that they personally had written it and received the presented criticism from their teacher—those in the wise feedback condition were more likely to assert that the teacher had high standards and believed in the recipient's potential to reach them, $b = 1.03$, $t(47) = 2.41$, $p = .02$, $d = 0.74$. Figure 5 displays the relevant covariate-adjusted means. Indeed, in the control condition, African American students' average score fell slightly, though not significantly, below the midpoint of the 6-point scale (3.5 out of 6). They thus neither agreed nor disagreed with the assertion that the teacher who provided the criticism held high standards and believed in their potential to reach them. By contrast, as shown in Figure 5, in the high standards and assurance condition African American students' average score fell significantly above the midpoint ($p = .002$). They agreed that the teacher had high standards and believed in their potential.

As in Studies 1 and 2, the high standards and assurance intervention did not have a significant effect among White students

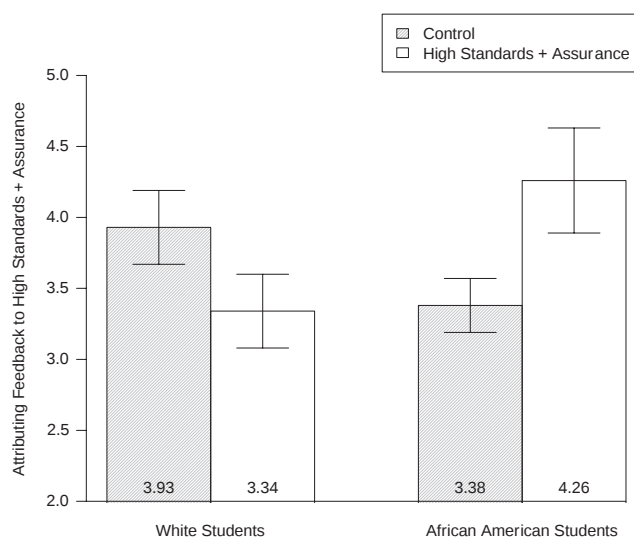


Figure 5. Effect of intervention on attributing critical feedback to high standards and personal assurance, by race, in Study 3. Values are covariate-adjusted means controlling for gender, preintervention grades, Grade 8 test scores, and socioeconomic status (means estimated in separate regression models for White and African American students). Error bars: ± 1 standard error.

(high standards and assurance: $M = 3.34$; control: $M = 3.93$), $b = -0.59$, $t(24) = -1.56$, $p = .13$, $d = 0.63$. Indeed the Feedback Condition $\times$ Race interaction was significant, $b = 0.79$, $t(73) = 2.03$, $p = .05$, $d = 0.46$. Our intervention helped to clarify the meaning of critical feedback among students for whom its meaning was expected to be most attributionally ambiguous, African Americans. As discussed earlier, these students are aware that they have a visible identity that could cause them to be seen as limited and thus bias their interpersonal treatment in school.

Did the high standards and assurance intervention improve grades?

Overall grades. Our primary question concerned whether teaching students to interpret teachers' criticism more favorably would improve African American students' overall achievement in core subjects. It did. Figure 6 provides covariate-adjusted means, and Figure 7 provides raw means in each marking period. In the full sample, there was a significant effect of the intervention on end-of-semester grades (Marking Period 3), which, as noted previously, reflect cumulative performance, $b = 2.66$, $t(73) = 2.27$, $p = .03$, $d = 0.24$. As in each of the two previous studies, however, this effect was significant for African American students, $b = 3.70$, $t(47) = 2.52$, $p = .01$, $d = 0.34$, but not for White students, $b = 1.46$, $t(24) = 0.82$, $p = .42$, $d = 0.19$. However, because the intervention effect ran (nonsignificantly) in the same direction for White students, the Feedback Condition $\times$ Race interaction was not significant, $b = 1.71$, $t(73) = 0.77$, $p = .44$, $d = 0.18$. Yet as in Studies 1 and 2, a contrast comparing African American students in the control condition with the remaining three cells was significant, $b = -2.64$, $t(73) = -2.63$, $p = .01$, $d = 0.61$, with no significant between-cell variance remaining, $\Delta F(2, 73) = 1.04$, $p = .36$. A sensible summary of the data is that the high standards and assurance intervention affected African American students' grades and not White students' grades—or that the effect for Whites, as in Studies 1 and 2, is small and statistically undetectable with the present sample size, relative to the effect for African Americans. For African American students, the intervention effect corresponds to roughly a third of a grade point on a standard 0–4 grade point average (GPA) scale.⁵

Interestingly, the treatment effect for African American students was evident in the marking period immediately following the intervention (Marking Period 2), $b = 2.89$, $t(47) = 2.56$, $p = .02$, $d = 0.27$, and again, not for White students, $t(24) = 0.45$, $p = .65$, $d = 0.08$. That the treatment effect for African American students grew by a quarter from $b = 2.89$ in Marking Period 2 to $b = 3.70$ in Marking Period 3 suggests that, if anything, the effect of this one-time treatment strengthened rather than decayed with time, at least during our window of observation.

Achievement gap. As Figure 7 shows, there was a significant preintervention racial achievement gap, with White students earning higher grades than their African American counterparts (African American, $M = 72.51$, $SD = 10.65$; White, $M = 79.59$, $SD =$

⁵ Supplemental analyses found that the treatment had a significant effect on African American students' performance in both humanities classes (English/language arts and history/social studies) and science and math classes: Effect on Marking Period 3 humanities grades is $b = 5.10$ points out of 100, $t(39) = 2.89$, $p = .007$, whereas the effect on Marking Period 3 science and math grades is $b = 4.44$ points out of 100, $t(42) = 2.19$, $p = .03$.

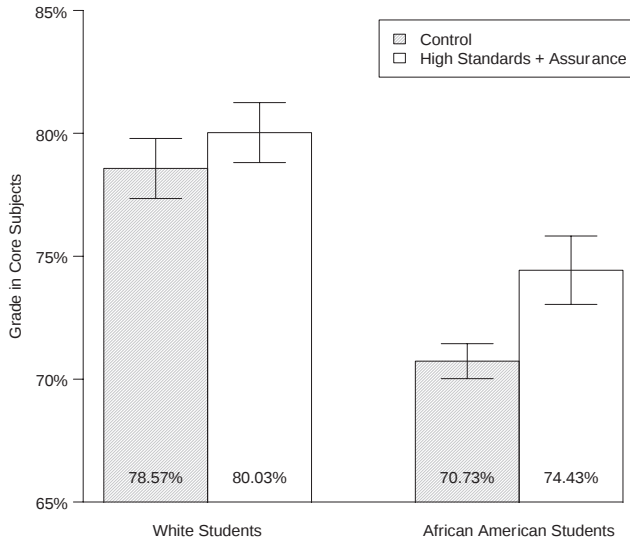


Figure 6. End of first semester grades in core subjects (math, English, history, and science) by race and experimental condition in Study 3. Values are covariate-adjusted means controlling for gender, preintervention grades, Grade 8 test scores, and socioeconomic status (means estimated in separate regression models for White and African American students). Error bars: ± 1 standard error.

6.58), $t(73) = 3.09$, $p = .003$, $d = 0.80$. By the end of the semester, however, the intervention had closed the racial achievement gap by roughly 39%. This reduction was computed by comparing the gap in grades between untreated African American students versus White students in both conditions with the grade gap between treated African American students and White students in both conditions.

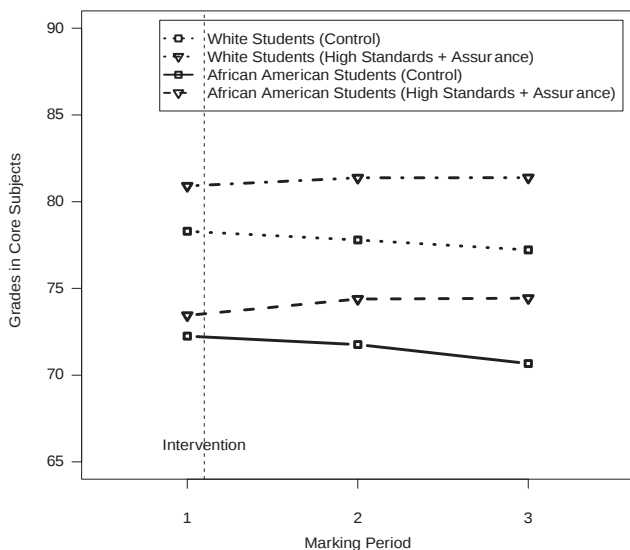


Figure 7. Grades in core subjects (math, English, history, and science) by marking period, race, and experimental condition in Study 3. Values are raw unadjusted means.

Downward cycles of achievement. As middle and high school marks a decline in academic motivation and grades especially for lower performers (Benner, 2011), it is noteworthy that the intervention did not boost grades but forestalled a downward trend (see Figure 7). This finding is consistent with previous research (Blackwell et al., 2007; G. L. Cohen et al., 2009), and Study 1 and 2's documentation of declining trust over time, that suggest that psychological interventions prevent downward recursive cycles in which negative psychological states, like mistrust, feed off their own consequences and produce worsening outcomes over time. Indeed, an analysis of change scores showed that only African American students in the control group showed a significant decline in grades over the semester (from the first to the third marking period), $t(47) = -2.44$, $p = .02$, $d = 0.70$. No other group did ($ts < |1.5|$). A regression analysis further confirmed that African American students evidenced a significantly smaller drop in grades in the wise criticism condition than in the control condition, $b = 3.51$, $t(47) = 2.40$, $p = .02$, $d = 0.33$ (see Figure 7).

Poor performance rates. A practically important outcome is the poor performance rate, defined here as the percentage of core courses in which students earned a D or below (< 70), the level at which the school asks them to repeat a course. The intervention nearly halved African American students' poor performance rate, from 43% of their academic courses in the control condition to 23% in the high standards plus assurance condition (numbers are raw percentages), $b = -0.20$, $t(47) = -2.89$, $p = .006$, $d = 0.83$ (see Figure 8). There was no condition effect among White students on this outcome ($t < .5$) and no significant omnibus condition effect, $b = -0.06$, $t(74) = -1.46$, $p = .13$, $d = 0.35$. The Feedback Condition $\times$ Race interaction was significant, $b = -0.14$, $t(74) = -3.24$, $p = .002$, $d = 0.74$.

Summary. In summary, the present study provides a conceptual replication and extension of the key findings from Studies 1 and 2. When African American students were encouraged to see criticism as a reflection of their teacher's high standards and belief

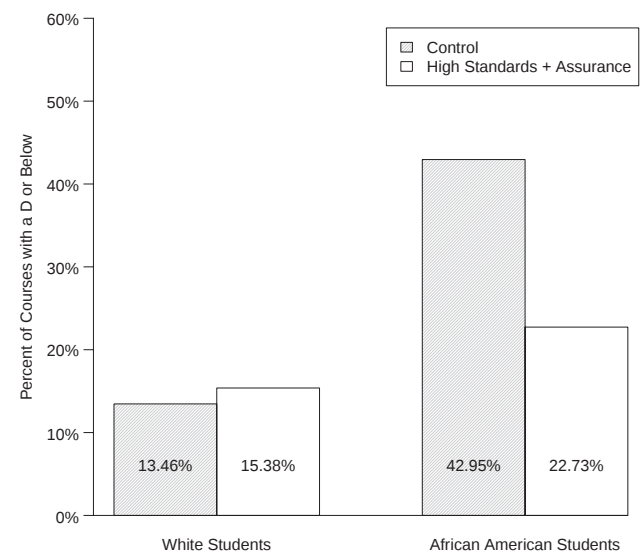


Figure 8. Poor performance rate in Study 3, by race and condition. Values are raw unadjusted percentages.

in their potential, their performance in core subjects improved. Additionally, Study 3 goes beyond the two previous studies by showing that a theory-driven intervention can produce an attributional shift in students that sticks. African American students were led to attribute ongoing feedback in school—rather than a single instance of it—to their teachers' high standards and belief in their potential. As a consequence they earned higher grades and were less likely to fail their courses.

General Discussion

What can lift the barrier of mistrust that undermines the motivation to act on critical feedback? A series of randomized field experiments showed that communicating high standards and a personal assurance of the student's potential to reach them can bolster minority adolescents' school trust and improve their academic behavior in response to critical feedback. Studies 1 and 2 showed that when teachers accompanied adolescent students' critiqued essays with a note communicating their high standards and belief in the recipient's ability to reach them, African American students were more likely to turn in revised essays (Study 1), to make the changes suggested by the teacher (Study 2), and write better revisions (Study 2). Study 3 extended the inquiry to overall achievement among older adolescents in high school and isolated the importance of attributions in this process. A brief intervention designed to encourage students to attribute critical feedback to their teachers' high standards and belief in their potential improved low-income, urban minority students' achievement over the course of a semester. In doing so the intervention closed the racial achievement gap in this sample by nearly 40%. The findings pertain to educational settings, but also speak to the dilemma faced by every mentor, coach, manager, and parent: How to promote an individual's cognitive, social, or emotional development through feedback that both instructs and motivates.

Trust: A Key Construct in Social-Cognitive Development

Our studies highlight the importance of trust for adolescent development. Studies 1 and 2 showed that chronic mistrust, measured over the 2 years in middle school, was strongly predictive of minority students' ability to benefit from a teacher's critical feedback. However, our psychological intervention relaxed their vigilance and halted the effect of mistrust. No longer did minorities' built-up mistrust of school affect their engagement with the feedback at hand. It was as though the intervention created a bubble in which their expectations of an unfair system no longer applied. Over time, it also seemed these expectations could be softened (or at least prevented from hardening further). These findings dovetail with the broader notion that social-cognitive interventions produce changes in behavior by severing the impact of past risk factors on present construals (Olson & Dweck, 2008; see also Lewin, 1947). Our findings are also consistent with past studies showing that timely and psychologically informed interventions can benefit academically at-risk students by setting in motion more beneficial recursive processes (G. L. Cohen et al., 2009; Garcia & Cohen, 2012; Walton & Cohen, 2011; Wilson et al., 2002).

Measured levels of trust did not predict behavior for White students in Study 2. This may be because White students' trust was

not low enough to be problematic, as few White students had low baseline trust (only 5% disagreed on average with a composite of the trust items in Study 2, compared with 27% of African American students). Yet there may be psychological reasons as well. A person's trust should be most important when attributional ambiguity is great, because it is in these moments that mistrust can "fill in the blanks" about an interaction partner's intentions. Attributional ambiguity is heightened when stigma is visible (Crocker et al., 1991). Perhaps for White students there is less attributional ambiguity because they are not visibly stigmatized, permitting them to take a teacher's comments at face value and recognize that they are concrete and peppered with encouragement. That is, chronic mistrust has less of an opportunity to color their interpretations. By contrast, African American students' visibly different group membership may cause them to question a teacher's intentions. The resulting ambiguity may leave relatively greater opportunity for mistrust to filter their interpretations. In summary, mistrust, like any prior belief or schema, should shape interpretations in ambiguous situations rather than unambiguous ones. Academic situations for many minorities are often more ambiguous, due to cultural stereotypes and historical events (Crocker et al., 1991).

It may seem paradoxical in Studies 1 and 2 that chronic mistrust could at the same time be predictive for African American students in the control group and yet subject to dramatic change among low-trust African American students experiencing wise criticism. Past research speaks to this seeming paradox. Many of the practices used by teachers, such as overpraising mediocre work or withholding criticism in an effort to boost self-esteem or build trust (Croft & Schmader, 2012; Harber, 1998, 2004), in fact hamper the development of trust and students' motivation to learn. They do this by reinforcing minority students' perceptions that they are being viewed stereotypically. Furthermore, even substantive critical feedback, when unaccompanied by a message of high standards and assurance, can be viewed with suspicion and deepen a stigmatized student's mistrust (G. L. Cohen et al., 1999; Crocker & Major, 1989). Consistent with this past research, low-trust African American students in the control conditions in both Studies 1 and 2 continued a sharp downward decline in trust over the course of seventh grade. Wise feedback, we believe, interrupted a self-reinforcing cycle in which mistrust fed off its own consequences. Although the feedback used in Studies 1 and 2 seems minor to outside observers, to students it may have felt impactful, as it provided strong counterevidence that they were being viewed stereotypically and treated unfairly (see also E. Aronson, Blaney, Stephin, Sikes, & Snapp, 1978).

In the long run, educators and youth development practitioners should go beyond these one-shot treatments and build a culture of high expectations and personal assurance to accompany their rigorous schoolwork. Incorporating these messages into students' daily experiences can lead these positive effects to be sustained and built on throughout adolescence (for examples, see Mathews, 2009, 2010).

More generally, psychological strategies for building trust are insufficient for eliminating racial achievement gaps. Wise criticism interventions can remove a barrier to better performance, but they must also be accompanied by real opportunities for growth. For instance, the invocation of high standards and personal assurance by themselves did not improve outcomes in Studies 1 and 2. The wise message helped catalyze the positive effects of teacher

criticism, as students were better able to seize an opportunity for learning. Invoking high standards and assurance without providing students with learning opportunities worthy of their best efforts may not convey to students that they are being respected and valued as learners.

Validity of the Experimental Approach

Each of our studies used a double-blind randomized design conducted in actual classrooms. None of the teachers knew the experimental condition that students were assigned to or the hypotheses of the study. Students had no awareness that the wise messages given to them were intended to affect their performance. The studies go beyond previous research because they were conducted in the field rather than the laboratory, featured middle and high school students in regular public schools rather than undergraduates at selective colleges, and tested the role of trust as a key construct. Several other features enhance the naturalism of our experiments. In Studies 1 and 2, teachers personally penned the wise feedback notes. Although teachers were guided to provide substantive critical feedback on all essays in Studies 1 and 2, they generally provided feedback as they normally did and used the strategies for fostering student motivation that they typically did. Thus, our intervention mattered above and beyond teachers' standard, intuitive strategies. Hence, these studies can be seen as "transforming experiments"—experiments that alter the relationships among people so as to activate "previously unrealized behavioral potentials" that exist in teacher-student interactions (Bronfenbrenner, 1977, p. 528).

Limitations and Future Directions

Even though in each of the three studies we obtained the largest sample size possible given the logistical constraints of conducting field experiments, our samples were relatively small. In the case of Studies 1 and 2, the need for each note to be handwritten by a cooperating teacher, the need to include only intermediate-performing students, and limits on the total number of these students in the school led to relatively small sample sizes, limiting our statistical power.⁶ Future research should extend to larger and more heterogeneous samples, ideally without compromising the precision and control of the procedures. At the same time, it is reassuring that the statistical significance of the effects in the present studies replicated reliably across studies in spite of low power. It is also reassuring that the effect of Study 3's intervention on overall GPA is analogous in size, about a third of a grade point, to that of many previous social-psychological interventions in education (Blackwell et al., 2007; G. L. Cohen et al., 2009; for a review, see Yeager & Walton, 2011). Moreover, the findings are reinforced by evaluations of highly successful educational innovations (e.g., Mathews, 2009; Treisman, 1992) and large-scale correlational research (e.g., Bryk et al., 1993). As one example, Shouse (1996) analyzed a large representative sample of American high school students to find that the combination of high academic standards and personal support to meet those standards, what Shouse labeled "academic press" and "community," interacted to predict achievement for racial minority students, but not for White students. Shouse also found that high standards alone did not reduce racial gaps (also the case in G. L. Cohen et al., 1999, Study

2). Hence, the experimental evidence presented here mirrors the findings from large-scale highly powered nonexperimental research.

Given the link between race and class in the United States, it is important to consider whether mistrust due to SES, not mistrust due to race, drove the results of our research. The data do not support this alternative explanation. As noted, racial trust gaps persist even when controlling for income and education (Smith, 2010). Additionally, we have conducted additional analyses using measures of SES. Student free and reduced-price lunch status was used in Studies 1 and 2; in Study 3, a composite of neighborhood income and educational attainment was used. In none of our three studies was the simple effect of wise feedback significant for lower SES students, whereas it was significant for African American students in all three studies even when controlling for the measure of SES. Thus, race-based mistrust was not a proxy for class-based mistrust. However, we suspect that class-based mistrust might play a role in certain contexts, for example, among disadvantaged undergraduates attending an elite college.

Interestingly, White students sometimes showed a nonsignificant trend of benefiting from the wise interventions. Although the interventions consistently yielded a significant omnibus condition effect, and a significant follow-up contrast among African Americans, its interaction with race did not reach significance on the focal performance outcomes (see also J. Aronson, Fried, & Good, 2002, for an analogous finding related to growth mindset interventions). This is not a limitation, as wise feedback could in principle benefit some nonstereotyped students too. However, the effect of wise criticism among Whites is, if it exists at all, small and less robust than the effect for African Americans, the stereotyped group. Yet the context dependency of social-psychological phenomena must be underscored. In certain contexts, White students may suffer from attributional ambiguity in their feedback interactions, and in such cases they should benefit from wise interventions. Examples could include White students in an African American studies course, White athletes in competitive sports, White employees with a physical disability, and so on.

The present research tested for the effect of wise feedback on only one minority group—African Americans. Whether other minority groups such as Latinos or Asian Americans would also benefit from wise feedback remains an open question. This is indeed possible, as Latino and Asian American adults have been found to show lower levels of trust relative to White adults in national surveys (Smith, 2010). Latinos in particular show mistrust rates almost as high as those among African Americans. Once again, however, the effect of wise feedback on these groups should depend on context. Various forces may conspire in a given context to give rise to mistrust among certain groups but not others. For instance, mistrust might hinge on whether students perceive their ethnicity to be known by their teacher, something that may occur for some Latino students but not others. This could depend on

⁶ Following recommendations by Schimmack (2012), we calculated the achieved power of the focal effects in each study (the effect of wise feedback on African American students' essay revisions or GPAs). Study 1 had an achieved power of .92, Study 2 had an achieved power of .58, and Study 3 had an achieved power of .66. This leads to an achieved total power of .35, which is within acceptable ranges noted by some experts (Ioannidis & Trikalinos, 2007).

visible features such as skin tone. Effects could also turn on whether students believe that their ethnicity biases their teachers in a negative way toward them, something that may occur sometimes but not always for Asian American students.

As Lewin (1951) and Bronfenbrenner (1977, 1979) suggested, the effects of any intervention will depend on the context into which it is introduced (see G. L. Cohen, 2011; Garcia & Cohen, 2012; Yeager & Walton, 2011). Wise feedback interventions presuppose that teachers provide solid feedback and that their intent is to help their students. Yet in settings where feedback is sparse and racial bias pervasive—as in settings where there is poor teacher quality or overt racial prejudice—an intervention that assures students that critical feedback is a sign of a teacher's belief in their potential would be ineffective and probably counterproductive. More generally, the effects of wise feedback arise not from intrinsic properties of the treatment but in their ability to encourage a person's engagement with the social context. To the extent that the context provides opportunities for growth, and mistrust inhibits students from seizing them, wise interventions ought to be beneficial. Interestingly, the low-income New York public school in Study 3 showed positive effects of the wise criticism intervention, suggesting that in some school settings the context could afford more learning than is sometimes thought.

One final future direction for research is to examine the reciprocal feedback loops between student and teacher that may fuel intervention effects (G. L. Cohen, 2011; G. L. Cohen et al., 2009; Garcia & Cohen, 2012). Such feedback loops may resemble the reciprocally reinforcing interactions between infants and their caregivers that, over time, shape infant development (Kochanska, 1997; Maccoby, 1999; Reis, Collins, & Berscheid, 2000). In theory, when a teacher's suggestions go unheeded, his or her view of a student could sour, leading the teacher to give less rigorous criticism in the future. This may confirm the student's belief that the teacher is biased, causing the student to disengage further, lowering the teacher's expectations for the student even more, in a reciprocal and recursive feedback loop (for analogous research on developmental cascades and hostile attributional biases, see Dodge, Greenberg, Malone, & Conduct Problems Prevention Research Group, 2008; Pettit, Lansford, Malone, Dodge, & Bates, 2010). These processes may ripple out to affect students' belief in their ability to control important outcomes in school or their expectations of graduating, going on to college, and succeeding in mainstream institutions. In this way, the reciprocal and recursive nature of performance processes in school may have social-cognitive consequences for the student that outlive his or her interaction with a specific teacher. An important area for future research concerns documenting how social-psychological interventions like wise feedback redirect dynamic cascades of development, ideally using long-term follow-ups.

Conclusion

Much research has focused on the lower standards or unequal resources commonly encountered by minority and low-income students. As a result, great emphasis has been placed on raising standards and increasing structural supports for such students. Although these efforts are essential, they are not always sufficient. Structural interventions often need to be complemented with psychologically wise strategies (Garcia & Cohen, 2012; Yeager &

Walton, 2011). Minority students could not fully benefit from their teacher's feedback unless it was accompanied by the wise assurance of their potential to reach a higher standard. Then the benefits of teacher criticism, previously suppressed, were catalyzed. Education reform efforts have given too little attention to the psychological side of the classroom experience and the notion that the same event, for instance, the same teacher criticism, may be perceived differently by members of different groups. When adolescents face negative stereotypes and harbor a measure of mistrust toward the academic system, a social-cognitive barrier can emerge that obscures the meaning of constructive feedback and prevents students from learning from it. Remedying inequalities in the educational system and beyond, of course, requires bringing real opportunities for learning to all students regardless of race, gender, or class. But it also necessitates creating a psychological climate that fosters trust and engagement.

References

- Almeida, D. M., & Wong, J. D. (2009). Life transitions and daily stress processes. In G. H. Elder, Jr. & J. Z. Giele (Eds.), *The craft of life course research* (pp. 141–162). New York, NY: Guilford Press.
- Aronson, E., Blaney, N., Stephin, C., Sikes, J., & Snapp, M. (1978). *The jigsaw classroom*. Beverly Hills, CA: Sage.
- Aronson, J., Fried, C., & Good, C. (2002). Reducing the effects of stereotype threat on African American college students by shaping theories of intelligence. *Journal of Experimental Social Psychology*, 38, 113–125. doi:10.1006/jesp.2001.1491
- Asch, S. E. (1957). An experimental investigation of group influence. In *Symposium on preventive and social psychiatry* (pp. 15–17). Washington, DC: Government Printing Office.
- Benner, A. D. (2011). The transition to high school: Current knowledge, future directions. *Educational Psychology Review*, 23, 299–328. doi: 10.1007/s10648-011-9152-0
- Biernat, M., & Manis, M. (1994). Shifting standards and stereotype-based judgments. *Journal of Personality and Social Psychology*, 66, 5–20. doi:10.1037/0022-3514.66.1.5
- Black, P. J., & William, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice*, 5, 7–74. doi: 10.1080/0969595980050102
- Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Theories of intelligence and achievement across the junior high school transition: A longitudinal study and an intervention. *Child Development*, 78, 246–263. doi:10.1111/j.1467-8624.2007.00995.x
- Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, 32, 513–531. doi:10.1037/0003-066X.32.7.513
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Brophy, J. E. (1981). Teacher praise: A functional analysis. *Review of Educational Research*, 51, 5–32. doi:10.3102/00346543051001005
- Brown, C. S., & Bigler, R. S. (2005). Children's perceptions of discrimination: A developmental model. *Child Development*, 76, 533–553. doi: 10.1111/j.1467-8624.2005.00862.x
- Brummelman, E., Thomaes, S., Overbeek, G., Orobio de Castro, B., van den Hout, M. A., & Bushman, B. J. (2013). On feeding those who hunger for praise: Person praise backfires among children with low self-esteem. *Journal of Experimental Psychology: General*. Advance online publication. doi:10.1037/a0031917
- Bruner, J. S. (1957). Going beyond the information given. In H. Gruber, K. Hammond, & R. Jessor (Eds.), *Contemporary approaches to cognition* (pp. 41–69). Cambridge, MA: Harvard University Press.

- Bryk, A. S., Lee, V. E., & Holland, P. B. (1993). *Catholic schools and the common good*. Cambridge, MA: Harvard University Press.
- Bryk, A. S., & Schneider, B. (2002). *Trust in schools: A core resource for improvement*. New York, NY: Russell Sage Foundation.
- Butler, R. (1988). Enhancing and undermining intrinsic motivation: The effects of task-involving and ego-involving evaluation on interest and performance. *British Journal of Educational Psychology*, 58, 1–14. doi:10.1111/j.2044-8279.1988.tb00874.x
- Cialdini, R. B. (2003). Crafting normative messages to protect the environment. *Current Directions in Psychological Science*, 12, 105–109. doi:10.1111/1467-8721.01242
- Cohen, D., Nisbett, R. E., Bowdle, B. F., & Schwarz, N. (1996). Insult, aggression, and the southern culture of honor: An “experimental ethnography”. *Journal of Personality and Social Psychology*, 70, 945–960. doi:10.1037/0022-3514.70.5.945
- Cohen, G. L. (2011). Social psychology and social change. *Science*, 334, 178–179. doi:10.1126/science.1212887
- Cohen, G. L., & Garcia, J. (2008). Identity, belonging, and achievement: A model, interventions, implications. *Current Directions in Psychological Science*, 17, 365–369. doi:10.1111/j.1467-8721.2008.00607.x
- Cohen, G. L., Garcia, J., Purdie-Vaughns, V., Apfel, N., & Brzustoski, P. (2009). Recursive processes in self-affirmation: Intervening to close the minority achievement gap. *Science*, 324, 400–403. doi:10.1126/science.1170769
- Cohen, G. L., & Steele, C. M. (2002). A barrier of mistrust: How negative stereotypes affect cross-race mentoring. In J. Aronson (Ed.), *Improving academic achievement: Impact of psychological factors on education* (pp. 303–327). San Diego, CA: Academic Press. doi:10.1016/B978-012064455-1/50018-X
- Cohen, G. L., Steele, C. M., & Ross, L. D. (1999). The mentor’s dilemma: Providing critical feedback across the racial divide. *Personality and Social Psychology Bulletin*, 25, 1302–1318. doi:10.1177/0146167299258011
- Crocker, J., & Major, B. (1989). Social stigma and self-esteem: The self-protective properties of stigma. *Psychological Review*, 96, 608–630. doi:10.1037/0033-295X.96.4.608
- Crocker, J., Voelkl, K., Testa, M., & Major, B. (1991). Social stigma: The affective consequences of attributional ambiguity. *Journal of Personality and Social Psychology*, 60, 218–228. doi:10.1037/0022-3514.60.2.218
- Croft, A., & Schmader, T. (2012). The feedback withholding bias: Minority students do not receive critical feedback from evaluators concerned about appearing racist. *Journal of Experimental Social Psychology*, 48, 1139–1144. doi:10.1016/j.jesp.2012.04.010
- Dodge, K. A. (2006). Translational science in action: Hostile attributional style and the development of aggressive behavior problems. *Development and Psychopathology*, 18, 791–814. doi:10.1017/S0954579406060391
- Dodge, K. A., Greenberg, M. T., Malone, P. S., & Conduct Problems Prevention Research Group. (2008). Testing an idealized dynamic cascade model of the development of serious violence in adolescence. *Child Development*, 79, 1907–1927. doi:10.1111/j.1467-8624.2008.01233.x
- Dovidio, J. F., & Gaertner, S. L. (2000). Aversive racism and selection decisions: 1989 and 1999. *Psychological Science*, 11, 315–319. doi:10.1111/1467-9280.00262
- Elder, G. H. (1998). The life course and human development. In R. M. Lerner (Ed.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (pp. 939–991). New York, NY: Wiley.
- Firth, D. (1993). Bias reduction of maximum likelihood estimates. *Biometrika*, 80, 27–38. doi:10.1093/biomet/80.1.27
- Gambetta, D. (1988). Can we trust trust? In D. Gambetta (Ed.), *Trust: Making and breaking cooperative relations* (pp. 213–235). New York, NY: Basil Blackwell.
- Garcia, J., & Cohen, G. L. (2012). A social psychological approach to educational intervention. In E. Shafir (Ed.), *Behavioral foundations of public policy* (pp. 329–347). Princeton, NJ: Princeton University Press.
- Goffman, E. (1963). *Stigma: Notes on the management of a spoiled identity*. Englewood Cliffs, NJ: Prentice Hall.
- Good, C., Aronson, J., & Inzlicht, M. (2003). Improving adolescents’ standardized test performance: An intervention to reduce the effects of stereotype threat. *Journal of Applied Developmental Psychology*, 24, 645–662. doi:10.1016/j.appdev.2003.09.002
- Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review*, 102, 4–27. doi:10.1037/0033-295X.102.1.4
- Harber, K. D. (1998). Feedback to minorities: Evidence of a positive bias. *Journal of Personality and Social Psychology*, 74, 622–628. doi:10.1037/0022-3514.74.3.622
- Harber, K. D. (2004). The positive feedback bias as a response to out-group unfriendliness. *Journal of Applied Social Psychology*, 34, 2272–2297. doi:10.1111/j.1559-1816.2004.tb01977.x
- Harber, K. D., Gorman, J. L., Gengaro, F. P., Butisingh, S., Tsang, W., & Ouellette, R. (2012). Students’ race and teachers’ social support affect the positive feedback bias in public schools. *Journal of Educational Psychology*, 104, 1149–1161. doi:10.1037/a0028110
- Harber, K. D., Stafford, R., & Kennedy, K. A. (2010). The positive feedback bias as a response to self-image threat. *British Journal of Social Psychology*, 49, 207–218. doi:10.1348/014466609X473956
- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77, 81–112. doi:10.3102/003465430298487
- Haynes, T. L., Perry, R. P., Stupnisky, R. H., & Daniels, L. M. (2009). A review of attributional retraining treatments: Fostering engagement and persistence in vulnerable college students. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 24, pp. 227–271). Dordrecht, the Netherlands: Springer. doi:10.1007/978-1-4020-9628-0_6
- Heath, C., & Heath, D. (2007). *Made to stick: Why some ideas survive and others die*. New York, NY: Random House.
- Heinze, G. (2006). A comparative investigation of methods for logistic regression with separated or nearly separated data. *Statistics in Medicine*, 25, 4216–4226. doi:10.1002/sim.2687
- Hughes, J. M., Bigler, R. S., & Levy, S. R. (2007). Consequences of learning about historical racism among European American and African American children. *Child Development*, 78, 1689–1705. doi:10.1111/j.1467-8624.2007.01096.x
- Ioannidis, J. P. A., & Trikalinos, T. A. (2007). An exploratory test for an excess of significant findings. *Clinical Trials*, 4, 245–253. doi:10.1177/1740774507079441
- Killen, M. (2012). *Online report for CNN Anderson Cooper 360° special report: “Kids on race: The hidden picture.”* Retrieved from <http://i2.cdn.turner.com/cnn/2012/images/03/29/ac360.race.study.pdf>
- Killen, M., Henning, A., Kelly, M. C., Crystal, D., & Ruck, M. (2007). Evaluations of interracial peer encounters by majority and minority US children and adolescents. *International Journal of Behavioral Development*, 31, 491–500. doi:10.1177/0165025407081478
- King, G., Honaker, J., Joseph, A., & Scheve, K. (2001). Analyzing incomplete political science data: An alternative algorithm for multiple imputation. *American Political Science Review*, 95, 49–69.
- Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, 119, 254–284. doi:10.1037/0033-2909.119.2.254
- Kochanska, G. (1997). Multiple pathways to conscience for children with different temperaments: From toddlerhood to age 5. *Developmental Psychology*, 33, 228–240. doi:10.1037/0012-1649.33.2.228
- Langer, E. J., Blank, A., & Chanowitz, B. (1978). The mindlessness of ostensibly thoughtful action: The role of “placebic” information in

- interpersonal interaction. *Journal of Personality and Social Psychology*, 36, 635–642. doi:10.1037/0022-3514.36.6.635
- Lawrence, J. S., Crocker, J., & Blanton, H. (2011). Stigmatized and dominant cultural groups differentially interpret positive feedback. *Journal of Cross-Cultural Psychology*, 42, 165–169. doi:10.1177/0022022110383569
- Lewin, K. (1943). Defining the “field at a given time”. *Psychological Review*, 50, 292–310. doi:10.1037/h0062738
- Lewin, K. (1947). Group decision and social change. In T. M. Newcomb & E. L. Hartley (Eds.), *Readings in social psychology* (pp. 459–473). New York, NY: Holt.
- Lewin, K. (1951). *Field theory in social science: Selected theoretical papers* (D. Cartwright, Ed.). New York, NY: Harper & Row.
- Maccoby, E. E. (1999). The uniqueness of the parent–child relationship. In W. A. Collins & B. Laursen (Eds.), *Minnesota Symposia on Child Psychology: Vol. 30. Relationships as developmental contexts* (pp. 157–175). Hillsdale, NJ: Erlbaum.
- Massey, G. C., Scott, M. V., & Dornbusch, S. M. (1975). Racism without racists: Institutional racism in urban schools. *Black Scholar*, 7(3), 10–19.
- Masten, A. S., Long, J. D., Roisman, G. I., Burt, K. B., Obradović, J., Roberts, J. M., . . . Tellegen, A. (2005). Developmental cascades: Linking academic achievement, externalizing and internalizing symptoms over 20 years. *Developmental Psychology*, 41, 733–746. doi:10.1037/0012-1649.41.5.733
- Mathews, J. (1988). *Escalante: The best teacher in America*. New York, NY: Holt.
- Mathews, J. (2009). *Work hard. Be nice: How two inspired teachers created the most promising schools in America*. Chapel Hill, NC: Algonquin Books.
- Mathews, J. (2010, April 4). Jaime Escalante didn’t just stand and deliver: He changed U.S. schools forever. *Washington Post*. Retrieved from <http://www.washingtonpost.com/wp-dyn/content/article/2010/04/02/AR2010040201518.html>
- McKown, C., & Weinstein, R. S. (2003). The development and consequences of stereotype consciousness in middle childhood. *Child Development*, 74, 498–515. doi:10.1111/1467-8624.7402012
- Mendoza-Denton, R., Goldman-Flyth, M., Pietrzak, J., Downey, G., & Aceves, M. J. (2010). Group-value ambiguity: Understanding the effects of academic feedback on minority students’ self-esteem. *Social Psychological and Personality Science*, 1, 127–135. doi:10.1177/1948550609357796
- Mueller, C. M., & Dweck, C. S. (1998). Intelligence praise can undermine motivation and performance. *Journal of Personality and Social Psychology*, 75, 33–52. doi:10.1037/0022-3514.75.1.33
- National Center for Education Statistics. (2008). *Characteristics of public, private, and Bureau of Indian Education elementary and secondary school teachers in the United States: Results from the 2007–2008 Schools and Staffing Survey* (Table 2. Percentage distribution of school teachers, by race/ethnicity, school type, and selected school characteristics: 2007–08). Retrieved from http://nces.ed.gov/pubs2009/2009324/tables/sass0708_2009324_t12n_02.asp
- Olson, K. R., & Dweck, C. S. (2008). A blueprint for social cognitive development. *Perspectives on Psychological Science*, 3, 193–202. doi:10.1111/j.1745-6924.2008.00074.x
- Pettit, G. S., Lansford, J. E., Malone, P. S., Dodge, K. A., & Bates, J. E. (2010). Domain specificity in relationship history, social-information processing, and violent behavior in early adulthood. *Journal of Personality and Social Psychology*, 98, 190–200. doi:10.1037/a0017991
- Reis, H. T., Collins, W. A., & Berscheid, E. (2000). Relationships in human behavior and development. *Psychological Bulletin*, 126, 844–872. doi:10.1037/0033-2909.126.6.844
- Rosenthal, R., & Rosnow, R. L. (2009). *Contrast analysis: Focused comparisons in the analysis of variance*. New York, NY: Cambridge University Press.
- Schimmack, U. (2012). The ironic effect of significant results on the credibility of multiple-study articles. *Psychological Methods*, 17, 551–566. doi:10.1037/a0029487
- Sherman, D. K., Hartson, K. A., Binning, K. R., Purdie-Vaughns, V., Garcia, J., Taborsky-Barba, S., . . . Cohen, G. L. (2013). Deflecting the trajectory and changing the narrative: How self-affirmation affects academic performance and motivation under identity threat. *Journal of Personality and Social Psychology*, 104, 591–618. doi:10.1037/a0031495
- Shouse, R. C. (1996). Academic press and sense of community: Conflict, congruence, and implications for student achievement. *Social Psychology of Education*, 1, 47–68. doi:10.1007/BF02333405
- Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, 75, 417–453. doi:10.3102/00346543075003417
- Smith, S. S. (2010). Race and trust. *Annual Review of Sociology*, 36, 453–475. doi:10.1146/annurev.soc.012809.102526
- Steele, C. M., Spencer, S. J., & Aronson, J. (2002). Contending with group image: The psychology of stereotype and social identity threat. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 34, pp. 379–440). New York, NY: Academic Press. doi:10.1016/S0065-2601(02)80009-0
- Treisman, U. (1992). Studying students studying calculus: A look at the lives of minority mathematics students in college. *College Mathematics Journal*, 23, 362–372. doi:10.2307/2686410
- Uslaner, E. M. (2002). *The moral foundations of trust*. Cambridge, England: Cambridge University Press.
- Wallace, J. M., Goodkind, S., Wallace, C. M., & Bachman, J. G. (2008). Racial, ethnic, and gender differences in school discipline among U.S. high school students: 1991–2005. *Negro Education Review*, 59, 47–62.
- Walton, G. M., & Cohen, G. L. (2007). A question of belonging: Race, social fit, and achievement. *Journal of Personality and Social Psychology*, 92, 82–96. doi:10.1037/0022-3514.92.1.82
- Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes among minority students. *Science*, 331, 1447–1451. doi:10.1126/science.1198364
- Wilson, T. D., Damiani, M., & Shelton, N. (2002). Improving the academic performance of college students with brief attributional interventions. In J. Aronson (Ed.), *Improving academic achievement: Impact of psychological factors on education* (pp. 89–108). San Diego, CA: Academic Press. doi:10.1016/B978-012064455-1/50008-7
- Wilson, T. D., & Linville, P. W. (1982). Improving the academic performance of college freshmen: Attribution therapy revisited. *Journal of Personality and Social Psychology*, 42, 367–376. doi:10.1037/0022-3514.42.2.367
- Yeager, D. S., & Walton, G. (2011). Social-psychological interventions in education: They’re not magic. *Review of Educational Research*, 81, 267–301. doi:10.3102/0034654311405999

Received July 9, 2012

Revision received February 4, 2013

Accepted February 12, 2013 ■