

Enhancing a Brief Writing Intervention to Combat Stereotype Threat Among Middle-School Students

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Experimental research has demonstrated both the deleterious effects of negative stereotypes about ability on academic performance and the relative ease with which stereotypes can be countered in educational settings. The extent to which stereotypes contribute to the achievement gap between American students from dominant social and economic groups and students from other groups is not precisely known, but the potential of brief, inexpensive interventions targeting stereotype threat to reduce the gap is worthy of further examination. Although researchers studying brief social psychological interventions sometimes mention the importance of the context in which interventions occur, they have not included manipulations of the environment in their interventions. In the current experimental study, a test of the effects of a brief self-affirming writing assignment was conducted in a new sample of middle-school students ($n = 132$), and an environmental enhancement to the writing exercise was tested ($n = 274$). Consistent with previous findings, the self-affirming intervention reduced the average decline in Social Studies grades over the school year compared with a neutral condition (effect size, $ES, .57$). The combination of the affirming writing assignment with an environmental enhancement had superior effects to the writing assignment alone ($ES .53$).

Keywords: brief intervention, stereotype threat, middle school, social environment, academic performance

Stereotype threat is defined as “the threat of being viewed through the lens of a negative stereotype or the fear of doing something that would inadvertently confirm that stereotype” (Steele, 2003, p. 111) and the resulting negative effects on performance. Social psychological research has established the power of negative stereotypes about ability to impede the academic performance of students from stereotyped groups, such as African Americans, Latinos, students from low-income families, and women (Croizet & Claire, 1998; McKown & Weinstein, 2003; Nguyen & Ryan, 2008; Steele, 1997; Steele & Aronson, 1995). Recent studies indicate that in addition to causing underperformance on academic tasks among stigmatized groups, stereotype threat also impedes the learning process (Mangels, Good, Whiteman, Maniscalco, & Dweck, 2012; Rydell, Shiffrin, Boucher, Van Loo, & Rydell, 2010; Taylor & Walton, 2011)—a finding that suggests the potential for even greater harm for the targets of negative stereotypes.

Research on mechanisms of stereotype threat in specific performance situations has revealed how easily threat can be triggered, for example, by framing activities as tests of ability or reminding students of their own stereotyped demographic characteristics. Much research examining the processes by which stereotype threat

causes underperformance focuses on “acute protective reactions” (Steele, 2003, p. 124), that is, immediate psychological responses through which individuals attempt to maintain self-integrity in the face of threat. Acute reactions to self-integrity posed by stereotypes include the emotional, cognitive, and physiological elements of anxiety (Mangels et al., 2012), efforts to suppress or deny stereotypes (Logel, Iserman, Davies, Quinn, & Spencer, 2009), and efforts to disprove or prevent the fulfillment of stereotypes (Schmader, Johns, & Forbes, 2008; Steele, 2003; Taylor & Walton, 2011). Researchers suggest that these acute reactions cause a diversion of cognitive resources that would otherwise be committed to the “controlled attention, effortful processing, and active self-regulation” (Schmader et al., 2008, p. 342) required for optimal performance in academic situations.

Stereotype Threat Intervention

Fortunately, experimental studies with secondary and postsecondary students demonstrate how countering the psychological processes that interfere with performance can be surprisingly simple and effective. Encouraging a brief focus on self-affirmation before a stressful exam, for example, can have a significant positive effect on performance. Perhaps the simplest and least expensive intervention studied so far involves asking students to write a 15-min essay about a positive value that is important to them (Cohen, Garcia, Apfel, & Master, 2006; Cohen, Garcia, Purdie-Vaughns, & Brzustoski, 2009; Miyake et al., 2010; Taylor & Walton, 2011). Not only did the exercise improve performance on immediate academic tasks in some studies (Taylor & Walton, 2011), in others it improved course grades weeks or even years later (Cohen et al., 2006, 2009; Miyake et al., 2010). Of most

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relevance to the current study, African American seventh graders who wrote a brief self-affirming essay early in the year in their Social Studies classrooms obtained better Social Studies grades over the grading term as well as better grade-point averages in general. Results persisted through the end of eighth grade (Cohen et al., 2009).

The possibility that the academic performance of stereotyped students could be improved with simple, brief interventions is as tantalizing as it is hard to believe. Even well-researched, school-based interventions requiring extensive resources and staff effort rarely obtain substantial effect sizes (Powers, 2005; Yeager & Walton, 2011), and many schools are not equipped to buy or implement such interventions even if they were available (Powers, Bowen, & Bowen, 2010). Yeager and Walton (2011), however, present possible explanations for the success of brief interventions in general. They refer, for example, to the concept in social psychology that “every attitude and behavior exists in a complex field of forces” (p. 274), some of which promote and some of which impede the learning or performance of individual students. Brief interventions may work by removing cognitive defenses that serve as “critical barriers” (impeding forces) to performance that prevent some students’ use of opportunities (promotive forces) in their own minds or in the classroom (Yeager & Walton, 2011, p. 275). The potentially large effects of brief interventions that have been observed may require the preexistence of appropriate learning opportunities and other promotive forces, such that once critical, subjective psychological barriers are removed, better performance can occur. The long-lasting effects of brief interventions may also require the existence of cognitive and environmental elements supportive of positive “recursive processes” (Cohen et al., 2009) once barriers are removed. Cohen et al. (2009) invoked this type of process to explain how effects of their seventh-grade intervention persisted through eighth grade, but they appear to refer primarily to recursive cognitive processes in the student. In the classroom, we suspect a central requirement would be the presence of a teacher who is responsive to information about positive characteristics of a student and/or signs of improved performance of a student.

Social-Environmental Nature of Stereotype Threat

Although discussions on brief social psychological interventions sometimes include mention of the context or environment in which the interventions occur, brief interventions so far have only attempted to manipulate individual-level psychological factors. A more ecological approach, such as that articulated by Bronfenbrenner (1979, 2005) and routinely used in the discipline of social work, also involves the social environment as a target of interventions. This perspective is also supported by the phenomenological variant of ecological systems theory (Spencer, 1999), which illustrates how experiences in the environment (e.g., stereotypes, teacher expectations), students’ self-perceptions, and coping strategies interact to affect outcomes. From these perspectives, stereotype threat does not exist solely within the psychology of an individual, but at the intersection of the individual and his or her environment (Shapiro & Neuberger, 2007). Interventions to counter threat therefore could target individual factors, such as cognitive defenses, and/or characteristics in the social environment. In school settings, for example, characteristics of the classroom con-

text for learning would be considered potentially influential intervention targets.

In the microsystem (Bronfenbrenner, 1979) of the classroom, the teacher is an important environmental force. Teachers dictate, model, incentivize, enforce, and reinforce expectations and norms for child and youth behavior in the classroom. The influence of teachers extends to the operation of stereotypes in the classroom (Jussim & Harber, 2005; Martens, Johns, Greenberg, & Schimmel, 2006; Steele, 2003). Teachers have the power (although not always the training or support) to construct classroom environments in which all students know they are valued, cared about, and safe from negative stereotypes; in which they experience competence and self-efficacy; and in which they are expected to progress and succeed academically regardless of background characteristics (Markus, Steele, & Steele, 2000). In the absence of complete or accurate and relevant personal information, teachers and other school staff may resort to stereotypes to form judgments of students (Guyl, Madon, Prieto, & Scherr, 2010). In the case of African American, Latino, and Native American students, the stereotypes by which they might be judged could include being low achievers, not being as intelligent as other students, and not having adequate language skills. Unfortunately, such stereotypes may contribute to lowered teacher expectations for students (Gonzalez & Ayala-Alcantar, 2008; Thomas, Caldwell, Faison, & Jackson, 2009), which are particularly powerful predictors of later achievement for negatively stereotyped students (Hinnant, O’Brien, & Ghazarian, 2009; McKown & Weinstein, 2008). Because teachers’ attitudes and beliefs about students significantly affect the classroom environment experienced by each student (Eccles & Roeser, 2011; Goodenow, 1993), including the nature of peer interactions (Farmer, Lines, & Hamm, 2011), and students’ subsequent performance (Raudenbush, 1984), teachers’ attitudes and beliefs are a potentially key environmental characteristic to target in stereotype reduction interventions.

The current study had two goals: (a) to replicate the findings of earlier studies (Cohen et al., 2006, 2009) that demonstrated positive effects of a brief, self-affirming writing intervention on the grades of African American middle-school students, and (b) to examine the effects of an enhanced intervention that simultaneously targeted the classroom environment. On the basis of the original study by Cohen et al. (2006), the first goal involved comparing the effects on grades of a self-affirmation writing condition and a neutral writing condition. We hypothesized, based on the 2006 study, that writing a self-affirming essay would positively affect middle-school students’ grades. The second goal involved comparing the effects of writing a self-affirming essay with the effects of writing a self-affirming essay that was also read by a teacher. The enhancement was simple, feasible, and consistent with the focus in both social psychology and social work on the interaction between individual psychology and the social environment. We hypothesized that if a student’s teacher read his or her self-affirming essay, the positive student-level psychological effects of the writing exercise would be enhanced. Specifically, teachers who became aware of their students’ positive values and experiences might develop less stereotyped views of students, more positive expectations of students, and higher regard for students—in other words, they might see students more as individuals and less as stereotypes. This change in the social environment in turn would be expected to reinforce or amplify the

achievement-boosting cognitive “recursive processes” initiated by the writing exercise alone (Cohen et al., 2006, 2009).

Method

Sample

The current analysis focuses on a subset of students who took part in a larger study comparing the grades of middle-school students assigned to six brief writing conditions. All regular education students ($N = 585$) in Grades 6, 7, and 8 at one middle school in a mostly urban area of the southeastern United States took part in the study. The intervention took place while students were in homeroom with their homeroom teachers ($n = 24$). The homeroom teacher of each student also taught one of the student’s core subjects. Students in the larger study were African American ($n = 407$), Latino ($n = 117$), or “other” ($n = 61$; White, Asian, multiracial) according to school records. (Academic performance of students in the multiracial category was higher than that of African American and Latino students, so they were grouped with the Asian and White sample members for analyses.)

In the current analysis, we focus on African American and “other” race/ethnic students in four conditions ($n = 313$). Latino sample members were excluded in order to focus on the primary race/ethnic groups in the original studies (Cohen et al., 2006, 2009). Of the 313 African American and “other” race/ethnic students, 274 had one or more observations on their quarterly Social Studies grade data and could be included in the analysis. Thirty-nine students with no Social Studies grade data were excluded. These students did not differ from the 274 with grade data with respect to gender ($\chi^2 = .037, p = .847$), race/ethnicity ($\chi^2 = .065, p = .799$), grade level ($\chi^2 = 3.76, p = .153$), or condition ($\chi^2 = 5.279, p = .152$).

Conditions did not differ significantly by gender ($\chi^2 = 6.65, p = .084$), race/ethnicity ($\chi^2 = 1.78, p = .619$), or grade level ($\chi^2 = 3.815, p = .702$). Prior year standardized math and reading test scores were available at the individual level for about 60% of the sample. Mean student test performance in math and reading before the intervention also did not differ significantly across conditions ($F = 1.33, p = .265$; $F = .208, p = .891$, respectively). These tests strongly suggest that the random assignment process resulted in equivalent groups across which the intervention effects can be evaluated, a point that is especially important because our first outcome measurement (Quarter 1 grades) occurred after the intervention.

Table 1 presents the demographic characteristics of the students included in the current analyses. Table 1 also indicates that 80% of the students at the school as a whole participated in the federal school lunch program, and a majority were performing below grade level in math, reading, or both (North Carolina Department of Public Instruction, 2011). These characteristics of the sample suggest that virtually all students at the school belonged to at least one negatively stereotyped group and/or had their own history of low performance. Therefore, unlike the Cohen et al. (2006, 2009) studies, our study does not include an adequately sized dominant cultural comparison group (e.g., White, middle class). Our interest is in promoting academic excellence of all students rather than making the performance of one dominant group the standard by which others are judged (Hilliard, 2003). Also, the current study

Table 1
Characteristics of Analysis Sample and the School Population Overall

Individual-level variable	Percent (<i>n</i>)	School-level characteristics ^a
African American	86.1 (236)	80% school lunch program participation <40% at or above grade level in reading <50% at or above grade level in math (individual-level data not available on these variables)
Asian/White/multiracial	13.9 (38)	
Boys	49.6 (136)	
Girls	50.4 (138)	
Grade 6	34.7 (95)	
Grade 7	34.3 (94)	
Grade 8	31.0 (85)	
Total <i>N</i>	274	

^a Source: North Carolina Department of Public Instruction (2011).

targeted sixth-, seventh-, and eighth-grade students, rather than just seventh graders as in Cohen et al.’s studies.

Procedure

Students were randomly assigned to write either a self-affirming essay or a neutral essay. The 24 homeroom teachers of the students were randomly assigned to either read or not read the essays of their students. See Table 2 for more detail on the conditions. Students completed the exercise in their homeroom classrooms at the beginning of the school day 2 weeks before the end of the first grading period. Teachers were provided with instructions and a script to follow when introducing and distributing the envelopes. Teachers and students were unaware of the nature of the experiment, its hypotheses, or students’ assignment to conditions. Teachers were aware that students responded to different prompts, but did not know the purpose of the prompts. Each student received an envelope labeled only with his or her name. Each envelope contained self-explanatory instructions, the assigned prompt, and paper for the essay. Students were not provided any information regarding whether or not their essays would be read by the teacher; however, students were explicitly told that their essays would not be graded. Teachers were advised not to look at students’ writing during the exercise or to talk about the writing exercise after it was completed. After 15 min of writing, students replaced all materials in their envelopes, sealed them, and returned them to teachers. Depending on whether they were assigned to the reading condition or not, teachers either returned their students’ essays unread to the study coordinator at the school or read them. The \$25 teacher incentive for taking part in the study was doubled for teachers assigned to the reading condition.

Measures

Students were given codes according to their randomly assigned intervention condition. At the end of the school year, gender, race/ethnicity, grade level, and quarterly grades were linked to student codes by school staff and given (without names) to the researchers. Quarterly grades were recorded on a 100-point scale. Consistent with previous studies of the effects of the writing intervention in middle school (Cohen et al., 2006, 2009), the current study reports on intervention effects on Social Studies grades. The coding of gender and race/ethnicity reflected each

Table 2
Description of Study Prompts and Conditions

Prompt	Teacher does not read essay (<i>n</i> = 12 teachers)	Teacher reads essay (<i>n</i> = 12 teachers)	<i>n</i>
Neutral: Think about the following list of values. Choose the one that is least important to you. Write for 15 minutes about why this value that is not very important to you might be important to someone else.	NEUTRAL Control condition (<i>n</i> = 74)	NEUTRAL + TEACHER Environmental only (<i>n</i> = 67)	141
Self-affirming: Think about a value, belief, talent, or skill you have that you are proud of. Write for 15 minutes about this positive part of yourself and why it is important to you.	AFFIRMATION Psychological only (<i>n</i> = 58)	AFFIRMATION + TEACHER Psychological + Environmental Intervention (<i>n</i> = 75)	133
Cases included in analysis (with outcome data)	132	142	274

variable's role in the each hypothesis test according to guidelines provided by Singer and Willett (2003, p. 115). In tests of both hypotheses, gender was a control variable. Because it was not of substantive interest, it was coded as a centered dummy. In tests of the first hypothesis (the self-affirming essay would positively affect students' Social Studies grades), race/ethnicity was dummy coded with "other" as the reference category. This coding facilitated comparisons of the effects of conditions on the performance of African American and "other" students (i.e., White, multiracial or Asian), consistent with the original study (Cohen et al., 2006). Like gender, race/ethnicity was centered as a control variable for tests of the second hypothesis (teachers' reading of essays would enhance effects of the self-affirming essays). Conditions were represented in these tests by three dummy variables, with the self-affirming essay alone (no teacher reading of essays) as the reference category. This coding allowed us to precisely test our hypotheses in relation to the original studies, but did not permit comparisons of other pairs of conditions. Values for the variable time (Academic Quarter 1, 2, 3, 4) were recoded to (time - 1), so the intercept of equations was zero.

Analyses

Analyses were conducted with Stata/SE version 10.0 (StataCorp LP, 1985–2007). For each hypothesis, we tested a series of longitudinal hierarchical linear models (HLM) using maximum likelihood estimation to examine how writing conditions affected trajectories of middle-school students' quarterly Social Studies grades. First an unconditional means model was estimated, followed by an unconditional growth model. Time (quarter) was modeled at Level 1; individual students were modeled at Level 2. Quadratic effects of time were also examined by adding a squared term. Condition and demographics were then entered. Because students had their homeroom teacher for one core subject, but other teachers in the sample for other subjects, and because the condition variable accounted partially for information in the teacher variable, no third-level clustering was modeled. Main effects of condition variables in the models represented condition effects on the intercept of students' grade trajectories. Effects of Time × Condition product terms represented condition effects on the slope of trajectories. Random effects of statistically significant Level 1 variables (time and interaction terms including time) were tested using Stata's likelihood ratio test and retained if significant. Because the covariance between the random effects of slope and

intercept was nonsignificant, the default diagonal error matrix was modeled instead of an unstructured matrix. All two-way interactions between pairs of predictors (time, gender, race/ethnicity, and condition) were examined and retained only if statistically significant.

In the notation used by Singer and Willett (2003), the following equations were estimated:

$$Y_{ij} = \pi_{0i} + \varepsilon_{ij} \text{ (Unconditional means equation, Level 1).} \quad (1)$$

$$Y_{ij} = \pi_{0i} + \pi_{1i}(\text{Time}) + \pi_{2i}(\text{Time})^2 + \varepsilon_{ij} \quad (2)$$

(Unconditional growth equation, Level 1).

$$\pi_{0i} = \gamma_{00} + \gamma_{01}(\text{Condition}) + \gamma_{02}(\text{gender}) + \gamma_{03}(\text{race/ethnicity}) + \gamma_{04}(\text{Level 2 interactions}) + \zeta_{0i} \text{ (Conditional Level 2 equation predicting the intercept of the Level 1 equation).} \quad (3)$$

$$\pi_{1i} = \gamma_{10} + \gamma_{11}(\text{cross-level interactions}) + \zeta_{1i} \text{ (Conditional Level 2 equation predicting the slope of the Level 1 equation).} \quad (4)$$

In Equations 1 and 2, the dependent variable, Y_{ij} , is the Social Studies grade of an individual student (*i*) for a quarter (*j*). π_{0i} is the mean Social Studies for an individual (*i*) across the four time points, and ε_{ij} is the difference of the individual's score at any time point from the mean of his or her score across all time points. The term π_{1i} in Equation 2 is the mean effect of time (school year quarter) on the Social Studies score of an individual (*i*). A second unconditional growth model tested for quadratic effects of time (π_{2i}). The squared term was removed when it was not significant. Similarly, the random effects of time were tested at this step and removed if not significant. In Equation 3, the dependent variable is the intercept of the unconditional models (π_{0i}). It is predicted by a mean intercept across individuals (γ_{00}), Level 2 predictors, and a term for the deviation of each individual's score from his or her predicted score. γ_{01} to γ_{03} are regression coefficients for condition, gender, and race/ethnicity. The term γ_{04} represents coefficients for a sequence of three 2-way interactions between the Level 2 predictors, which were tested one at a time and retained or omitted depending on their significance. In Equation 4, the dependent variable is the slope term of the Level 1 growth equation

(π_{1i}). It is predicted by a mean slope across individuals (γ_{10}), a series of two-way cross-level interactions created by multiplying time by each of the Level 2 predictors, and a deviation score for each individual.

Effect sizes of statistically significant effects were calculated using the Hedge’s g formula for HLM models with cluster-level assignment presented by What Works Clearinghouse (2008, Appendix B):

$$g = \frac{\gamma}{\sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{(n_1 + n_2 - 2)}}}$$

If the intervention had a main effect on the outcome, the numerator was the regression coefficient for the main effect. When cross-level interactions were involved, the numerator was the simple slope of the effect. Variance values in the denominator were random variance values of the constant in unconditional intercept models if the intervention had a main effect on the outcome; they were random variance values of time in Level 1 (time only) models if the intervention affected change over time, or the slope, of the outcome trajectory.

Results

Research Question 1: Can the beneficial effects of the self-affirming writing intervention that have been observed in prior research (Cohen et al., 2006, 2009) be replicated with a new sample? The first sequence of analyses compared the Social Studies grade trajectories of students who wrote self-affirming essays (AFFIRMATION) with the grade trajectories of those in the control condition, who wrote neutral essays (NEUTRAL). Neither of the “teacher reads essay” conditions was included in this analysis. The overall mean of Social Studies grades of the 132 students in the two conditions examined was 85.58. The mean unconditional quarterly decline in grades for students in the two conditions was .79 points. Table 3 presents the estimates from the final model.

The table indicates that although condition did not significantly affect the starting level of the grade trajectories for students in the two groups, writing a self-affirming essay did reduce the decline in grades over time relative to the NEUTRAL condition from 1.26 points to .19 points per quarter. The Hedge’s g effect size for the

slope difference is .57 (simple slope = 1.07; n for students in NEUTRAL = 74, n in AFFIRMATION = 58; variances of slope in unconditional model for NEUTRAL and AFFIRMATION conditions = 3.79 and 3.18, respectively). Figure 1 illustrates the effect. Effects of the intervention did not differ by race/ethnicity, and at no time point did the levels of grades differ significantly across condition.

Research Question 2: Does the reading of students’ self-affirming essays by teachers enhance the positive effects of the writing intervention? The second sequence of analyses compared the Social Studies grade trajectories of students who wrote self-affirming essays (AFFIRMATION) with those of students in the control condition (NEUTRAL) and the two conditions in which teachers read student essays (AFFIRMATION + TEACHER, NEUTRAL + TEACHER). We were particularly interested in the comparison of the AFFIRMATION + TEACHER and AFFIRMATION conditions. The overall mean of Social Studies grades of the 274 students in the four conditions was 86.95. The mean decline in grades in the unconditional model was .55 points per quarter. Table 4 presents estimates from the final model.

The table reveals that the AFFIRMATION + TEACHER condition had a statistically significant impact on the starting level of Social Studies grade trajectories relative to the AFFIRMATION intervention. Two weeks after the writing intervention, students who wrote self-affirming essays and had their essays read by teachers received first-quarter grades that were almost 3.7 points higher than those who wrote affirming essays that were not read by teachers. The Hedge’s g effect size for this value was 0.53 (main effect = 3.66; n for AFFIRMATION = 58, n for AFFIRMATION + TEACHER = 75; variances of intercepts in unconditional model for AFFIRMATION and AFFIRMATION + TEACHER conditions = 62.62 and 37.33, respectively). The AFFIRMATION + TEACHER condition did not have a statistically significant effect on the *change* in Social Studies grades over time, relative to the AFFIRMATION condition, only on the starting point. The slope effect of the self-affirming essay (AFFIRMATION) relative to the neutral essay (NEUTRAL) that was related to Hypothesis 1 was the only other significant finding in the test of Hypothesis 2. That is, students in the AFFIRMATION condition did not have significantly higher grades relative to the NEUTRAL or NEUTRAL + TEACHER conditions, and their grades did not decline at a slower

Table 3
Final Model Comparing Effects of Writing a Self-Affirming Essay With Writing a Neutral Essay
(With No Teacher Reading of Essays)

Predictor	Unconditional means model	Unconditional growth model	Final model
Intercept	85.58 ($p = .000$)	86.76 ($p = .000$)	87.89 ($p = .000$)
Time		-0.79 ($p = .002$)	-0.19 ($p = .613$)
NEUTRAL effect on intercept (vs. AFFIRMATION)			2.47 ($p = .064$)
African American (vs. White, multiracial, “other”)			-2.56 ($p = .176$)
NEUTRAL effect on slope (vs. AFFIRMATION)			-1.07 ($p = .033$)
Centered control			
Gender			-3.30 ($p = .009$)
Random effects			
Intercept	51.33	44.27	40.56
Slope		3.57	3.42
Residual	30.59	23.72	23.57

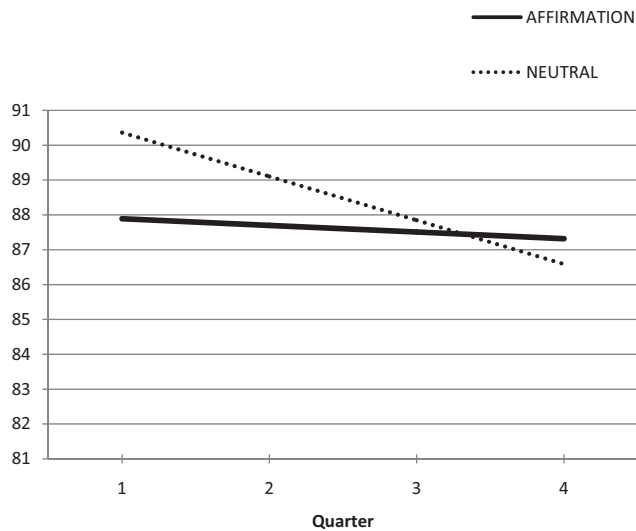


Figure 1. Statistically significant slope effect of condition on quarterly Social Studies grades controlling for gender and race/ethnicity.

rate than those of students in the NEUTRAL + TEACHER condition. The Hedge's g of this effect was presented above. Figure 2 illustrates the significant findings.

Discussion

In this experimental study, we first tested the hypothesis that writing a self-affirming essay would have beneficial effects relative to writing a neutral essay on the Social Studies grades of stereotyped middle-school students. As expected from the previous experimental studies (Cohen et al., 2006, 2009), our sample benefited from the self-affirming essay. The effect was on the change in grades over the school year. Specifically, the typical decline in Social Studies grades that occurred over the school year among students at the target school was significantly slowed among students who wrote affirming essays relative to students randomly assigned to write neutral essays. Because the original Cohen et al.

(2006) study did not test for differences in the rates of change in grades over time, it is not clear whether the higher scores observed in that study among stereotyped students who wrote self-affirming essays was due to abrupt statistically significant increases in grades or a different rate of change in grades over time that led eventually to significantly higher scores. The duration of our study (one academic year) was not long enough to evaluate whether the observed trajectory would extend far enough into the next school year to ultimately lead to statistically higher grades among students who wrote self-affirming essays.

Unlike in the Cohen et al. (2006, 2009) studies, we did not find significant differences in the effects for African American and non-African American students (European American in the Cohen et al. studies). At least two likely explanations exist for this finding. First, our comparison sample of Asian, European American, and multiracial students was small relative to the African American group, giving us limited statistical power to detect differences between African Americans and these groups. Second, because of high rates of poverty and low performance among students at the school, it is likely that many in the non-African American group were subject to other stereotypes, such as those based on social class. Therefore, they did not, on average, represent a comparison group unaffected by stereotypes.

Our findings expand on previous work by using more sophisticated statistical modeling techniques, including sixth and eighth graders in addition to seventh graders, and by having a predominantly low-income sample. The findings suggest that the benefits of writing self-affirming essays in the classroom generalize beyond the characteristics of the original sample to low-income students and students who may belong to more than one stereotyped group. In addition, although it appears that in the first year of the original study (as described in Cohen et al., 2009) students experienced additional booster interventions, our study suggests that one "dose" in the fall can have benefits that last until the end of the school year. Our findings are promising in that they suggest even historically low-performing schools may have promotive forces available to support student success once critical barriers are addressed. They also suggest that positive recursive processes may be "jump-started" in such schools with brief interventions.

Table 4

Final Model Comparing Effects of Writing a Self-Affirming Essay With Writing a Neutral Essay and Two Conditions in Which Teachers Read Essays

Predictor	Unconditional means model	Unconditional growth model	Final model
Intercept	86.95 ($p = .000$)	87.79 ($p = .000$)	85.74 ($p = .000$)
Time		-0.55 ($p = .001$)	-0.19 ($p = .587$)
NEUTRAL effect on intercept (vs. AFFIRMATION)			2.38 ($p = .057$)
NEUTRAL + TEACHER effect on intercept (vs. AFFIRMATION)			1.87 ($p = .146$)
AFFIRMATION + TEACHER effect on intercept (vs. AFFIRMATION)			3.66 ($p = .003$)
NEUTRAL effect on slope (vs. AFFIRMATION)			-1.07 ($p = .022$)
NEUTRAL + TEACHER effect on slope (vs. AFFIRMATION)			-0.05 ($p = .923$)
AFFIRMATION + TEACHER effect on slope (vs. AFFIRMATION)			-0.23 ($p = .614$)
Centered controls			
Gender			-3.10 ($p = .000$)
African American (vs. Asian, White, multiracial)			-3.91 ($p = .001$)
Random effects			
Intercept	49.76	42.25	36.65
Slope		3.36	3.17
Residual	25.47	19.56	19.55

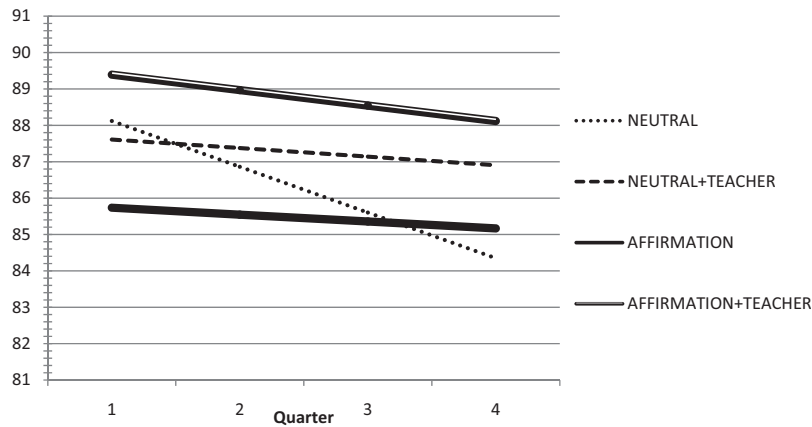


Figure 2. Intercept and slope effects of condition on Social Studies grades controlling for race/ethnicity and gender. The intercept of the AFFIRMATION + TEACHER trajectory is significantly higher than the intercept of the AFFIRMATION trajectory. The slope of the AFFIRMATION trajectory is significantly less steep (downward) than the slope of the NEUTRAL trajectory.

On the basis of principles of social work intervention and an ecological perspective of child development and performance, we expected that by increasing teachers' familiarity with positive values held by students, the beneficial effects of writing a self-affirming essay would be amplified. The recursive psychological processes posited by previous researchers (Cohen et al., 2006, 2009; Yeager & Walton, 2011) would be fueled by any number of teacher gestures and communications toward students, making the classroom environment one in which threats to students' identities would become increasingly less salient. Our second analysis tested this hypothesis. Although we did not directly measure teacher attitudes or behaviors, by randomly assigning students to four conditions, we were able to compare the effects of writing an affirming essay with three other scenarios: writing a neutral essay with and without having it read by a teacher, and writing an affirming essay that is read by a teacher.

Students in the condition receiving the AFFIRMATION + TEACHER intervention had statistically higher Social Studies grades than those in the AFFIRMATION condition (but not those in the NEUTRAL or NEUTRAL + TEACHER conditions). Students in the AFFIRMATION condition, in turn, as in the test of Hypothesis 1, evidenced a slower decline in Social Studies grades over the school year than those in the NEUTRAL condition (but not those in the NEUTRAL + TEACHER condition). The findings indicate that although students can benefit from writing self-affirming essays alone, teachers' reading essays in and of itself does not promote higher achievement. No benefits were observed for students who wrote neutral essays that were read by teachers. It was only when teachers read *self-affirming* essays that our sample of stereotyped students, on average, benefited.

The authors of the original studies of the effects of the self-affirming essay on middle-school students' academic performance (Cohen et al., 2006, 2009) attribute the intervention's beneficial effects to its fueling of positive recursive psychological processes. The act of students writing about positive values they hold affirms positive aspects of their identities, allowing the students to remember their own unique strengths and to diminish the salience of negative stereotypes. Although the existing literature on this inter-

vention attributes its success to self-affirmation and individuation, the writing task itself could also be considered a thought replacement strategy because it requires students to concentrate on something positive rather than any negative thoughts they might be experiencing. Although self-affirmation and individuation are obviously additional cognitive tasks, they do not drain resources from working memory and automatic processing capacity as do other, less beneficial responses to stereotype threat, such as attempting to suppress distressing thoughts or vigilant self-monitoring (Logel et al., 2009; Schmader et al., 2008). Whether cognitive resources are freed or preexisting promotive factors such as motivation are tapped, performance improves, and feedback on the improved performance may lead to future better performance via a snowballing recursive psychological process (Cohen et al., 2009). Finding effects on grades that persisted across the school year even without booster exercises is especially encouraging.

In the current study, assigning teachers to read students' essays has extended individuation to the environmental level through the hypothesis that the essays would help teachers view students as unique individuals rather than relying on preconceived expectations or stereotypes. Knowing unique, personal information about students would allow teachers to provide environmental reinforcement for students' positive identities. The environmental benefit found in teacher reading appears to have amplified the positive effects of the original self-affirmation and individuation strategies.

Our study contributes to the stereotype threat literature by testing an intervention in a population consisting primarily of stigmatized students (e.g., low-income and minority students). Additional strengths of the study include the use of hierarchical longitudinal modeling of grade trajectories, the systematic testing of interactions, the use of controls for gender and race/ethnicity effects on grades, and the calculation of effect sizes. The study used two random assignment procedures—one at the individual level and one at the teacher level. All available evidence suggests that random assignment led to equivalent intervention groups. In the interest of parsimony and because the starting point of our study was a previous study, we focused our hypotheses on comparisons of the previously tested intervention (the self-affirming

essay) with the previously tested control condition and our two new conditions (neutral essay read by teacher and self-affirming essay read by teacher). Therefore, we did not test for differences between every possible pair of conditions. We also focused on Social Studies grades, as was done in the original study. Because Social Studies is considered to be less affected by gender stereotypes (Cohen et al., 2006), intervention effects are presumed to be unconfounded by gender.

A limitation of the study is that we were not able to examine the role of student expectations that their essays would be read by teachers or not. Students were told that their essays would not be graded, but they were not explicitly told whether or not their essays would be read by teachers. We assume that in the absence of statements to the contrary, students expect teachers to read any work they do in the classroom. It is possible, therefore, that simply believing their teachers would read their self-affirming essays enhanced the effects of writing the essays for some students, even if reading the essays caused no change on the part of the teacher. However, if such a cognitive effect occurred for some students, it should have affected those who wrote affirming essays similarly regardless of whether they were in the AFFIRMATION condition or the enhanced AFFIRMATION + TEACHER condition. The finding of different levels of trajectory starting points is inconsistent with this explanation.

An additional limitation is that we did not measure changes in teacher attitudes and behaviors associated with reading student essays. Although we noted a positive effect of teachers' reading affirming essays, future research should examine the exact mechanism by which change occurred. The lack of data on student performance from the prior year is also a limitation, although with random assignment to conditions, this is less of a concern. Our results suggest that the writing intervention on average can benefit students who are low performing, because most of the students in the school were low performing, but we could not test for moderation by prior performance levels.

Implications for Future Research

Future research should seek greater understanding of the experiences of various cultural and economic groups with stereotypes and stereotype threat. The immense variation in cultural, historical, and social environmental experiences that exist within schools and communities across the United States may affect the operation of brief interventions that target psychological and social environmental factors in ways that are currently not fully understood. Effects of this intervention specific to Latino students will be discussed in a forthcoming article.

The interactive perspective suggested in this study is consistent with a typology recently proposed by Shapiro and Neuberg (2007), in which stereotype threat situations are categorized by the roles that both self and others occupy in the threatening situation. For example, students in one cultural group may be more likely to worry about confirming stereotypes to themselves, whereas students belonging to another cultural group may find the threat of confirming stereotypes to other observers to be more salient. Future studies should test hypotheses about the validity and utility of this typology. Better understanding of the nature of threats and the mechanisms by which they are most effectively countered in demographic subgroups will promote the development of appro-

priate brief interventions. If stereotype threats are qualitatively different, coping and compensatory strategies to reduce stereotype threat are likely not "one size fits all"—rather, strategies must be matched appropriately to situational characteristics in order to most effectively negate the threat (Shapiro, 2011). On the basis of their placement in Shapiro's (2011) typology, some students might benefit from writing essays that are not read by teachers or from responding to prompts tailored more to the nature of their experienced threat.

Implications for Practice and Policy

Although it may be tempting to rely on brief, low-cost interventions to improve the academic achievement of stereotyped students, there is a larger lesson to be learned from the current study. Transforming American classrooms into settings free from socially constructed psychological barriers to achievement may be an attainable goal. It is not as daunting a goal as eliminating stereotypes in the greater culture. Teachers can work routinely to create classrooms in which student performance is optimized regardless of the persistence of negative stereotypes in the larger society. Strategies for teachers that are consistent with the brief intervention literature include explicitly countering and debunking stereotypes in the classroom; promoting the growth mindset (Blackwell, Trzesniewski, & Dweck, 2007; Dweck, 2006); building supportive relationships with students; and otherwise consistently affirming the self-integrity, competence, and belonging of each student in the classroom. Having teachers read self-affirming essays is one way to reduce critical psychological barriers to achievement, but combining brief interventions with more sustained and integrative efforts to banish stereotype threat in the classrooms will likely yield the greatest benefits in the long run.

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