

## Deflecting the Trajectory and Changing the Narrative: How Self-Affirmation Affects Academic Performance and Motivation Under Identity Threat

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To the extent that stereotype and identity threat undermine academic performance, social psychological interventions that lessen threat could buffer threatened students and improve performance. Two studies, each featuring a longitudinal field experiment in a mixed-ethnicity middle school, examined whether a values affirmation writing exercise could attenuate the achievement gap between Latino American and European American students. In Study 1, students completed multiple self-affirmation (or control) activities as part of their regular class assignments. Latino American students, the identity threatened group, earned higher grades in the affirmation than control condition, whereas White students were unaffected. The effects persisted 3 years and, for many students, continued into high school by lifting their performance trajectory. Study 2 featured daily diaries to examine how the affirmation affected psychology under identity threat, with the expectation that it would shape students' narratives of their ongoing academic experience. By conferring a big-picture focus, affirmation was expected to broaden construals, prevent daily adversity from being experienced as identity threat, and insulate academic motivation from identity threat. Indeed, affirmed Latino American students not only earned higher grades than nonaffirmed Latino American students but also construed events at a more abstract than concrete level and were less likely to have their daily feelings of academic fit and motivation undermined by identity threat. Discussion centers on how social-psychological processes propagate themselves over time and how timely interventions targeting these processes can promote well-being and achievement.

*Keywords:* achievement gap, self-affirmation, stereotype threat, intervention

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The achievement gap in academic performance in the United States between students who differ in their ethnicity, race, or socioeconomic status is a social issue that concerns educators, social scientists, and policy makers as well as students and their parents. Academically at-risk minority students, such as Latino Americans<sup>1</sup> and African Americans, earn lower school grades than their European American peers, and they are much more likely to drop out of a high school (Jencks & Phillips, 1998; United States Department of Education, 2009). Many explanations have been offered for this achievement gap, including poverty (Reardon, 2011), immigration status (Gandara & Contreras, 2009), parenting practices and limitations in English literacy (Lopez, 2009), class size, school racial mix, and educational policies (Jencks & Phillips, 1998). All these factors contribute to the achievement gap, and they are the focus of social, organizational, and educational policy efforts to reduce it (see Gandara & Contreras, 2009; Mitchell, Ream, Ryan, & Espinoza, 2008; Neal, 2005; Rothstein, 2005).

Social psychological factors, such as the stress, uncertain belonging, and threat that can stem from being a member of a negatively stereotyped or marginalized group, also account for a portion of educational achievement gaps among ethnic and racial groups in the United States (Steele, 1997, 2010; see also Cohen & Garcia, 2008; Nisbett, 2009; Walton & Cohen, 2007). Interventions addressing these social psychological factors have attenuated achievement gaps between African American and White students (e.g., Aronson, Fried, & Good, 2002; Oyserman, Bybee, & Terry, 2006; Walton & Cohen, 2011; for reviews, see Cohen & Garcia, 2008; Cohen, Purdie-Vaughns, & Garcia, 2012; Garcia & Cohen, 2012; Yeager & Walton, 2011). The present research focuses on one social psychological intervention, writing about important values in a *self-affirmation* activity (Steele, 1988; see also Sherman & Cohen, 2006; Sherman & Hartson, 2011) in ethnically integrated middle schools with predominantly White and Latino American populations. This intervention has been shown to help individuals overcome identity threat and improve their performance in situations where their groups are negatively stereotyped or marginalized (Cohen, Garcia, Apfel, Master, 2006; Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009; Martens, Johns, Greenberg, & Schimel, 2006; Miyake et al., 2010; Shapiro, Williams, & Hambarchyan, in press).

The current research rests on the principle that examining how social-psychological processes unfold over long time periods can enrich and sharpen our understanding of them (Cohen & Garcia, 2008; Garcia & Cohen, 2012; Lewin, 1943; Yeager & Walton, 2011). These studies feature two longitudinal field experiments in middle schools in two different geographic locations of the United States. They are the first to test a values affirmation intervention with Latino Americans, the most rapidly growing ethnic minority group in the United States (Day, 2011; Pew Hispanic Center, 2011). This research advances three theoretical issues. Study 1, in addition to examining whether the intervention lifts the trajectory of Latino American students' grades, tests whether such performance effects, if they do occur, persist when students enter high school. In Study 2, psychological outcomes linked to identity threat and potentially attenuated by the intervention are tracked over 1 year with the selection of measures informed by a general theoretical model of the effects of values affirmations (Sherman, 2012; Sherman & Hartson, 2011). Finally, we assess potential

moderators of the performance effect particularly germane to Latino populations: acculturation and ethnic group identification.

### The Role of Identity Threat in Academic Settings

Identity threat occurs when an individual's self-view is challenged. Stereotype threat is a form of such threat (Steele, 1997, 2010; Steele & Aronson, 1995) that occurs when the possibility exists that a valued social aspect of one's identity (e.g., an ethnic group identity) could be devalued in a given setting (Purdie-Vaughns, Steele, Davies, Dittmann, Randall Crosby, 2008; Steele, Spencer, & Aronson, 2002). Such identity threats include discrimination, exclusion, marginalization, and underrepresentation due to minority status, all of which can contribute to underperformance (Jencks & Phillips, 1998; Nisbett, 2009).

These factors threaten not only objective opportunity but also psychological well-being. Merely being aware that one's social or group identity could cause one to be devalued can prove psychologically threatening. For instance, a Latino American student may worry about being judged in light of a negative stereotype regarding the intellectual ability of his or her ethnic group (Aronson, 2002). This can constitute a self-threat (Cohen et al., 2006), a threat to his or her feeling of belonging in school or work (Walton & Cohen, 2007), and an additional cognitive burden (Schmader, Johns, & Forbes, 2008), all of which can undermine performance (Steele et al., 2002). Because stereotypes are widely disseminated and propagated in much of society, such stereotype threat can occur regardless of the actual level of prejudice in the environment, though encounters with prejudice would generally exacerbate it. The negative effect of stereotype threat on performance has been documented for many identity-threatened groups (see Steele et al., 2002; Inzlicht & Schmader, 2012, for reviews), including low socioeconomic status students in school (Croizet & Claire, 1998), White students confronted with the stereotype that Asians are superior in math (Aronson, Lustina, et al., 1999), and the elderly confronted with stereotypes about age and memory (Abrams, Eller, & Bryant, 2006).

Stereotype and social identity threat may play a role in Latino American academic performance, as suggested by both ethnographic (see Hurd, 2004, as discussed in Gandara & Contreras, 2009) and experimental research (Gonzales, Blanton, & Williams, 2002). In educational contexts Latino American students may contend with stereotypes that their ethnic group is less likely to succeed than other groups, stereotypes that stem from cultural beliefs in the United States that immigrants, second language speakers in general, and Spanish speakers in particular are less likely to succeed in school than people who were born in the United States and are primarily English speakers (Aronson, 2002; Gandara & Contreras, 2009; Guyll, Madon, Prieto, & Scherr, 2010). Laboratory studies suggest that stereotype threat may lead Latino Americans to underperform relative to their White class-

<sup>1</sup> We use the term "Latino Americans" to refer to Latino Americans/Latina Americans and Hispanic Americans. Although Latino/Latina Americans/Hispanics are a heterogeneous group, including people in the United States who come from Mexico, Cuba, and other Spanish speaking countries as well as Puerto Rico (Pew Hispanic Center, 2011), they share a common social identity, particularly in the context of public schools, where the current research takes place (Gandara & Contreras, 2009). We use the terms "White" and "European American" interchangeably.

mates (Gonzales et al., 2002; see also Schmader & Johns, 2003). Such threats may prevent students from performing to their potential and, by increasing fears of failure or rejection, deter them from educational opportunities (Steele, 2010).

### Psychological Consequences of Identity Threat Over Time

In a classroom or work setting, identity threat can be a chronic stressor (Steele et al., 2002). It is an experience that occurs and recurs, with each reoccurrence possibly increasing the likelihood that it will intensify. In such situations, identity threat can have at least two significant consequences. First it may force individuals into a state of acute vigilance, leading them to monitor the immediate environment for cues that help determine the presence and intensity of threats to their identity (Cohen & Garcia, 2008; Kaiser & Major, 2006; Murphy, Steele, & Gross, 2007). This could narrow an individual's attention and lead to a short-term orientation (Pennington & Roese, 2003), factors associated with a relatively low or concrete level of construal (Trope & Liberman, 2010). Identity threat also makes it more likely that the inferences about what is occurring in a given situation will be tied to immediate, local elements in an individual's surroundings rather than the more abstract or global factors in that situation. In the classroom, for instance, a minority student who experiences identity threat may scrutinize a teacher's nonverbal behavior for evidence of bias, rather than attend to other equally important sources of information (Cohen & Garcia, 2008; Kaiser & Major, 2006; Murphy et al., 2007). In one illustrative study, people who erroneously believed that they would appear facially disfigured to others were more likely to engage in a fine-grained analysis of the other person's nonverbal behavior, vigilant to telltale signs of bias (Strenta & Kleck, 1984). Likewise, low power, an aspect of stigmatization, has been tied to low levels of construal (Smith & Trope, 2006).

Lower levels of construal are not by definition negative or detrimental. Indeed a narrow and focused construal can be highly adaptive (Wakslak, Trope, Liberman, & Alony, 2006). For example, consider a person under physical threat, someone that becomes aware that a venomous snake has entered his or her home and is lurking somewhere unseen (see Steele, 2011, for this example). It is not a moment to dedicate time and mental resources to pondering the broader questions regarding the evolution of snakes or their place in the ecosystem. Rather, one should focus as completely as possible on the immediate threat posed by this snake. It is near and dangerous, depriving the person of the psychological distance needed for abstraction (Trope & Liberman, 2010). Indeed, it makes little sense to spend the time or mental resources abstracting central meanings beyond, "There is a danger that needs to be addressed." And yet, this adaptive response could have unintended consequences. The immediate demand to attend to the details in school or work when one confronts threat can reduce the valuable mental, emotional, and physical resources needed to meet important longer-term obligations (Schmader & Johns, 2003).

Beyond low levels of construal, a second consequence may follow from identity threat. Those experiencing identity threat can perceive an event differently from those not so threatened, and as a consequence the significance and importance of that event can also vary for these individuals. Returning to the snake example, that noise in the closet can easily be dismissed as a shirt falling off

its hanger by someone who is unconcerned that a snake is lurking somewhere in the house. But when the homeowner suspects a snake is afoot, rustling in the closet may confirm the presence and imminence of the feared entity. Likewise everyday hardship in the classroom can take on a threatening significance in the light of a stereotype about one's race, gender, or ethnicity. Negative feedback from a teacher, rejection by peers, and other challenges common in adolescence may seem more like confirmation of identity devaluation rather than simply negative or aversive personal experiences. This notion is implicit—though not directly tested—in previous research. Studies have found that on days that minority students experience relatively more adversity, or during periods when they earn relatively low grades, their sense of belonging in school falls (Cook, Purdie-Vaughns, Garcia, & Cohen, 2012; Walton & Cohen, 2007).

In summary, the present research examines two psychological consequences of identity threat: first, a low level of construal thought to result from vigilance and, second, a psychological linking of adversity, racial threat, and academic motivation. We propose that for those laboring under the possibility that a negative racial stereotype may be applied to them in a situation, critical or adverse experience may heighten a sense of race-based threat that then may increase the tendency to construe subsequent similar experience in this way. This can strengthen the individual's sense that a social identity is being threatened. This psychological process is recursive in nature, feeding off its own consequences in a repeating cycle that could contribute to worsening performance over time (Cohen et al., 2009).

### Values Affirmation Interventions to Reduce Identity Threat

Adolescence marks a time of novel and defining struggles on the path to adulthood, in which individuals construct a narrative for themselves about who they are and who they aspire to be, which includes establishing a sense of their moral and adaptive adequacy (Hall, 1904; McAdams, 2006; Steele, 2010; Wilson, 2011). In this period in which they are crafting an identity, identity threats can make establishing a sense of adequacy significantly more demanding, particularly in academic settings (Aronson & Good, 2003; Eccles, Lord, & Midgley, 1991; Schunk & Pajares, 2001; Simmons, Black, & Zhou, 1991). According to self-affirmation theory people are motivated to see themselves as globally capable, moral, and good—as being "adaptively adequate" or having "self-integrity" (Steele, 1988). For students, being adaptive typically means doing well in school (H. W. Marsh & Shavelson, 1985). For minority students, a potential threat to their sense of adequacy is the possibility that their racial or ethnic group is devalued in the academic environment. However, people can assert their adequacy in a threatening environment by engaging in self-affirmations (Steele, 1988).

Self-affirmations remind a person of sources of personal integrity and meaning that are enduring, unconditional, even transcendent (Burson, Crocker, & Mischkowski, 2012; Harris & Epton, 2010; Schimmel, Arndt, Banko, & Cook, 2004; Schmeichel & Vohs, 2009). They often take the form of reflections on core values like religion or relationships with family and friends. Self-affirmations enable a person to pull back and see a specific stressor in a larger context that renders it less psychologically dire (Steele, 1988; see

reviews by Aronson, Cohen, & Nail, 1999; McQueen & Klein, 2006; Sherman & Cohen, 2006; Sherman & Hartson, 2011).

By making alternative sources of self-integrity salient, self-affirmations are theorized to reduce the psychological threat arising in a specific situation (Sherman & Cohen, 2006). In so doing, affirmations can help shore up the “narrative of adequacy” that students form as they make sense of their academic struggles, and this can prevent a negative event from threatening the self. When people affirm core values, they experience less physiological stress in evaluative settings, for instance when giving a presentation to a judgmental audience (Creswell et al., 2005) or when preparing for important examinations (Sherman, Bunyan, Creswell, & Jaremka, 2009). Stress is reduced, in part, because the focal stressor has fewer self-evaluative implications when other sources of self-integrity are salient.

Values affirmations broaden the perceived sources of self-integrity, and in academic settings, they can thus alleviate social identity threat, not necessarily by reducing the perception of how much threat is “in the air,” but by making such threat less psychologically disruptive. This, in turn, might help focus students on the academic tasks at hand—studying, learning, taking tests—rather than on the self-evaluative and group-evaluative implications of success or failure at these tasks. Self-affirmation may reduce the effects of identity threat by conferring a sense of global self-integrity that would put everyday threats in context. In the context of a global perception of adequacy, an experience with identity threat should prove less debilitating. Insofar as the affirmation is well-timed to occur when threat might otherwise feed off its consequences and trigger a spiral of vigilance, the affirmation may have consequences that persist and even compound, armoring students against the inevitable hardships of adolescence in school (Cohen & Garcia, 2008; Cohen et al., 2012; see also Schmeichel & Vohs, 2009).

The present research builds on and extends a series of field studies that investigated the effects of affirming important aspects of the self on easing the evaluative stress that minority group members may feel when faced with the threat of confirming negative stereotypes about their racial or ethnic group (Cohen et al., 2006, 2009; Cook et al., 2012). Researchers gave African American and White students in a mixed race school a series of structured writing exercises beginning early in the seventh grade school year and continuing through it (Cohen et al., 2006, 2009). African American students in the affirmation condition, who wrote about highly important values, earned higher grades than African American students in the control condition in the first academic term of the seventh grade year (Cohen et al., 2006), with a follow-up investigation demonstrating that the effects persisted for 2 years (Cohen et al., 2009). By contrast, the affirmation had no effect on the grades of White students, the nonthreatened group.

### Contributions of the Present Research

One objective of the present research is to test the efficacy of the values affirmation intervention among a new group—Latino American students in mixed ethnicity middle schools. Whether the values affirmation intervention would be effective among Latino American students constitutes an important empirical and conceptual question. It is not a foregone conclusion, as there have been no studies with clear outcomes using self-affirmation in predomi-

nantly Latino American samples, and there are theoretical reasons to question whether affirmation effects would extend to Latino Americans. The only published self-affirmation study that focused on Latino Americans found weak and inconsistent results on the outcome of interest, perceptions of racism (Adams, Tormala, & O’Brien, 2006), an outcome very different from academic performance.

Why may affirmations be less effective for Latino Americans? One possible reason is that those with Latin American cultural backgrounds tend to have a more interdependent conception of the self (Hofstede, 2001; Lindsley & Braithwaite, 1996; Sanchez-Burks, 2002; Shkodriani & Gibbons, 1995; see also Marin & Triandis, 1985; Tropp & Wright, 2003). Values affirmation methodology—because of its emphasis on writing about personally self-defining values—may be less effective for them and more effective for those from individualistic cultural backgrounds (Heine & Lehman, 1997), such as European Americans (e.g., Markus & Kitayama, 1991) and African Americans (Cohen et al., 2006; see also Jones, 2003; Oyserman, Coon, & Kimmelmeier, 2002). Evidence supporting this possibility must be taken with caution, as it involves generalizing research from East Asians to Latino Americans (see Ruby, Falk, Heine, Villa, & Silberstein, *in press*, for a discussion). However, consistent with the present speculation, research that has compared people from individualistic (e.g., European Canadians) and collectivistic cultural contexts (e.g., Asian Canadians or Japanese) has generally found relatively weaker or even nil effects of the standard values affirmation manipulation for members of collectivistic cultures (Hoshino-Browne et al., 2005).

Nevertheless, we predicted that the affirmation intervention would be effective among Latino American students for two reasons. First, Latino American students and African American students—despite many differences in their experiences—are similar in that they are both members of groups stereotyped as being academically limited (Altschul, Oyserman, & Bybee, 2008; Steele, 2010). Values affirmations have been shown to remedy the experience of social identity threat that, we think, can characterize many Latino Americans’ experience of school. Second, recent research suggests that values affirmation writing exercises may be effective not because they remind people of their unique personal strengths but because they enhance their subjective connectedness (Crocker, Niiya, & Mischkowski, 2008; Shnabel, Purdie-Vaughns, Cook, Garcia, & Cohen, *in press*). In simple terms, writing about values can connect people to causes greater than self.

Beyond attempting to generalize to Latino Americans, we also test whether the effects generalize to a new academic context by examining whether performance effects persist when students go from middle school to high school. That is, do the effects of a psychological intervention on academic performance persist after the intervention has ended and when its beneficiaries move into a new context? If the intervention works by assuring students of the safety of their local school environment (e.g., “Teachers here care about my values”), its benefits may not generalize to a new school. However, if the intervention works by buttressing the students’ enduring narratives of adequacy formed as they were crafting their identities in a new academic setting (Wilson, 2011), then the effects may persist.

Study 2, beyond testing whether the affirmation benefits the grades of Latino students over an academic year in a separate

sample and providing a replication of Study 1, attempts to capture evidence of how self-affirmation affects the trajectory of identity threat over time by assessing the students' construal levels and daily perceptions throughout the academic year to tap the in-vivo experience of adversity, identity threat and feelings of academic fit in school. We expect that affirmation will insulate the self from ongoing adversity in school by facilitating a broad level of construal and untethering daily adversity from identity threat, and identity threat from academic motivation. This is especially important for members of stereotyped groups, who might otherwise see such adversity as confirming that they do not belong and that the daily ups and downs they experience in school are related to their identity.

A third major contribution of this research is to examine potential moderators of the effect of values affirmations. The purpose of these moderation analyses is to examine what factors may be important to the experience of Latino American students, and how this sheds light on the potential effectiveness of the values affirmation manipulation. First, to shed light on the potential cultural specificity of the effects, we examine whether it is the most American-aculturated Latino students who benefit most from the affirmation intervention. If only those Latino students who speak and write predominantly in English and are most acculturated to U.S. culture benefit from the exercises, then it would suggest that the values affirmation may not be as effective for those for whom collectivism and interdependence have been ascribed. Second, we examine ethnic group identification as a potential moderator. Two possibilities are plausible. First, because Latino Americans are a heterogeneous group and many are not visibly of a different ethnic group, the degree to which they experience identity threat due to being Latino may be predicted by the extent to which they identify themselves with their ethnic group (Schmader, 2002). According to this logic, those high in ethnic group identification may suffer greater stereotype threat and thus benefit from the affirmation more. On the other hand, research suggests that high identification can serve as a source of solidarity and affirmation (Cohen & Garcia, 2005) and that highly identified group members may be more likely to use their group as a psychological resource (Sherman, Kinias, Major, Kim, & Prenovost, 2007). Lacking this buffer, those low in ethnic identification may be vulnerable to the consequences of identity threat and thus more likely to benefit from an externally provided affirmation.

### Overview

We conducted two longitudinal studies in two mixed-ethnicity (predominantly Latino American and White students) middle schools, each at least a year in duration. To assess the generality of the process, two studies were conducted in different school systems in different states (one in the Mountain West in Study 1, and one in the Pacific West in Study 2). Both studies described in this article required 1 year of preparation, during which meetings were held with school superintendents, principals, school psychologists, and teachers to obtain permission and to negotiate logistics. The school psychologist and literacy expert advised us on literacy issues and grade-level appropriate wording of questions. The meetings with the teachers were essential as the teachers administered the affirmation writing tasks in the course of their regular instruc-

tion. We worked with them to develop standard procedures, scripts, and intervention materials.

### Study 1

The middle school research site for Study 1 had a number of features that distinguish it from previous research sites where affirmation interventions were tested. According to school records at the time of the study, approximately 47% of the students were identified as White and 45% were identified as Latino American. While the school was located in a middle-class neighborhood, the student body was relatively low income, with approximately 50% of all students in the school receiving meal assistance. In particular, the Latino American portion of the sample was disproportionately low income, as approximately 90% of Latino Americans received meal assistance. Approximately 81% of Latino American students had parents who were first generation immigrants (predominantly from Mexico, based on school records and discussions with school administrators). The study was conducted with the entire school (sixth, seventh, and eighth grade), whereas the previous studies (Cohen et al., 2006, 2009) were conducted only with seventh grade students. Through intensive recruitment efforts, the sample was representative of the school site, with 73% of the student body participating, compared with 50% in previous studies (Cohen et al., 2006). Study 1 thus provides a rigorous and ecologically representative test of the effect of affirmation, and does so among a new group, Latino Americans, many of whom came from economically disadvantaged families that had recently immigrated to the United States.

Due to concerns regarding the fact that many of the Latino American students were not totally fluent in English (58% of Latino American students were enrolled in an English-as-a-second-language course, and 80% spoke Spanish as the primary language at home, according to school records), and the possibility that the materials used previously with seventh graders (Cohen et al., 2006, 2009) would be less intelligible and impactful for younger grade levels, a pilot study was conducted with some of the student participants ( $N = 127$ ) in the second term of the previous academic year. The pilot study revealed that the intervention materials were too complex for many of the sixth graders and so new materials were developed with school personnel that simplified the instructions and exercises. For example, the materials were revised to provide clear and specific prompts, the values were reworded in relatively concrete terms (e.g., "Relationships with Friends and Family" was reworded to "Being with Friends and Family"), and values were referred to as "things" in the prompts (e.g., "List the top two reasons why these things are important to you"). These students were then reassigned randomly to condition at the start of the focal year when they were seventh graders—as were the new incoming sixth graders and any new seventh graders entering the study. The previous year's seventh graders, by contrast, comprehended the materials, and so they maintained their condition as they entered the focal year of the study (when they were eighth graders). The pattern of results reported below are consistent across the different grades, and in no case was the condition effect among Latino Americans moderated by grade level or by whether the student had participated in the pilot test (all  $F_s < 1.0$ ).

## Method

**Participants.** The final sample consisted of 199 sixth, seventh, and eighth grade students (according to official school records: 111 male, 88 female; 103 White, 81 Hispanic/Latino American, seven Black/African American, and eight Asian/Asian American). To be included in the final sample of both Studies 1 and 2, students had to meet three criteria. As was anticipated when school sites were selected, only White and Latino American students had populations large enough to analyze, and thus the results focus only on students from these groups. In addition, analyses are restricted to students who (a) completed at least two writing exercises over the course of the year and (b) received a core-course grade point average (GPA) within three studentized residuals of the mean estimated from the analytic model ( $N = 1$  excluded in Study 1), because extreme observations can exert a disproportionate effect on significance testing (Judd, McClelland, & Culhane, 1995). Inclusion of outliers exerted no consistent effects across studies on significance levels (sometimes strengthening, sometimes weakening effects). The one case where a significant effect was rendered marginal (in Study 2) is designated with a footnote at the relevant point. Grade data were obtained for all students who met these criteria.

Parental permission slips, on which parents could consent for their child to participate in the research or decline, were distributed to all students in each of the three grade levels prior to the first intervention. Students who returned the permission slips received a gift certificate and were enrolled in a lottery for a larger prize, regardless of whether their parents consented to their participation or not. A total of 276 permission slips were distributed, and 219 were returned (80%). Of those who returned the slips, 92% provided consent to participate ( $N = 201$ ), and of these 99.5% (200) completed at least two writing exercises and 99% were in the final sample (thus only two participants were lost to attrition). This ethnic distribution of the final sample (52% White, 41% Latino American, 4% African American, and 4% Asian American) closely approximated the distribution of the school as a whole. Students' median age at the beginning of the focal school year was 12 years.

When students were absent on the day of a treatment, intensive effort was made to locate them on a later date so that they could complete the exercise. Among the focal ethnic groups, there were 184 students who met the inclusion criteria and are thus included in the final sample (55 sixth graders, 79 seventh graders, and 50 eighth graders). Ninety-two participants were randomly assigned to the affirmation condition (51 White, 41 Latino American), and 92 were assigned to the no-affirmation control condition (52 White, 40 Latino American).

### Procedure.

**Pretest survey.** At the start of their school year, and before the commencement of the affirmation intervention, participants completed a pretest survey that included demographic questions as well as various self-report scales. These are described in greater detail in the combined Study 1 and Study 2 moderator analyses section.

**Affirmation procedure.** As in a carefully designed laboratory study, administration of the intervention manipulation was tightly scripted, and there was a great deal of prior preparation and attention to methodological detail to ensure impact and control in

the potentially chaotic environment of a classroom (materials and scripts are available from the researchers). In preparatory meetings with the researchers, the teachers were carefully trained and provided with a script for introducing the exercises (e.g., "In class today, you're going to be doing a short writing exercise. . . . Please be quiet and leave as much space as possible between yourselves. . . ."). The script also specified responses for any student questions that might arise (e.g., "This is an exercise that the school gives to their students a few times a year.")

Teachers administered the writing exercises on predetermined days as part of regular class assignments by distributing envelopes to the students that contained their randomly assigned exercise. Written on each envelope was the name of the student for whom the exercise was designated, which served to personalize the exercise and keep teachers unaware of condition assignment (see Cohen et al., 2009, Supplemental Materials, p. 5, for more information on how teachers were kept unaware of condition). The teachers monitored any questions that students raised and completed log reports that were used in developing additional activities over the course of the school year. The administration was tightly scripted such that students were instructed to remain quiet while writing and to raise their hand for any questions so that the teacher could approach them personally to minimize chances for students to discover differences among the exercises. In addition, the visual appearances of the exercises were very similar across conditions, preventing students from noticing differences. Importantly, the exercises were covertly delivered by the researchers outside of regular school hours, and once completed covertly returned to them, again outside of regular school hours, with the goal of eliminating the possibility for students to link the exercises to a research project.

In both affirmation and control conditions, exercises were administered on four to five occasions. The values affirmation tasks encouraged students to reflect on core personal values, like relationships with friends and family. The no affirmation control tasks, by contrast, encouraged students to reflect on nonaffirming topics. Both were administered in the form of a structured writing assignment embedded in a packet of materials. The materials sometimes featured value-relevant icons (e.g., a baseball mitt and art easel) to make them more visually engaging and memorable (Heath & Heath, 2007). However, in order to avoid repetitiveness, three different affirmation tasks were developed (described below). All writing exercises were based on the standard affirmation task used in Cohen et al. (2006, 2009) and similar to standard control and affirmation tasks in prior research (McQueen & Klein, 2006). Thus, while the exercises were based on prior research, they were adapted to the goals of the research (different exercises to avoid repetitiveness) and to the constraints and characteristics of the school site (simplified instructions to accommodate lower English literacy).

**Structured values affirmation task.** In the first two affirmation tasks that participants received, they were presented with a list of values titled "What are your personal values?" and, through a structured series of prompts, asked to write an essay about either important or unimportant values. Participants randomly assigned to the self-affirmation condition were provided a list of 11 values, such as "Being Good at Art," "Being Religious," and "Having a Sense of Humor," and they were asked to pick two or three that were important to them. To avoid repetitiveness and to broaden the

list of values to include the threatened domain, the second affirmation altered the ordering of the values (with three counterbalanced value-ordering conditions [this did not affect results]) and included a few changes in content. For instance, “Enjoying sports” became “Being good at sports” and “Being smart or getting good grades” was included as a possible value.<sup>2</sup> For both the first and second affirmations, the second page of the packet guided students to “Write a few sentences describing why these things are important to you.” By contrast, participants assigned to the control condition were given the same list of values, but they were instructed to pick two or three that were *not* important to them and to “write a few sentences describing why these things would be important to someone else.” In both conditions, participants were instructed to “focus on your thoughts and feelings, and don’t worry about spelling or how well written it is.” After writing the essay, participants in both conditions were instructed to look at their chosen values again and respond to three easy-to-agree-with questions about their values that reinforced the manipulation, something we thought might be important for the less literate students (Schwarz, 1999). For example, those in the affirmation condition indicated their agreement by circling yes or no to the statement, “These things are an important part of who I am”, whereas those in the control condition indicated their agreement with the statement, “These things are important to some people.”

**Open-ended affirmation task.** Unlike the structured values affirmation task, this task allowed participants to reflect on their values in an open-ended manner. Participants in the affirmation condition read a brief paragraph citing examples of values that people tend to hold (e.g., spending time with family and friends, playing sports, having a sense of humor). After reading these examples, those in the affirmation condition were then asked to “describe something that’s important to **you** in your life.” Participants in the control condition were asked to indicate what time they woke up that morning, and what, if anything, they had eaten for breakfast, and how they got to school that morning.

**Tailored affirmation task.** Participants in the affirmation condition received a writing task that was tailored to one of the values they had singled out as important to them in the previous affirmations. The value was matched to participants’ most consistently important value as reflected in previous exercises and hence was tailored for each student. Participants were guided to write a brief essay describing how the specified value would be important to them in the coming spring. Participants in the control condition were asked to describe how they get home at the end of the day, how long it takes them, whether they have a snack, and at what time they go to sleep.

**Timing of treatments.** The timing of the affirmation activities differed slightly by grade cohort due to pragmatic constraints. However, two objectives informed their timing. First, we wanted to administer the interventions as early in the academic year as possible. The recursive cycle posited to underlie long-term affirmation effects suggests that it is better to intervene early, as early outcomes in a transition have effects that compound over time (Cohen et al., 2009; Cook et al., 2012). Second, we wanted to administer the interventions during periods expected to be relatively high in stress or concerns about belonging—specifically, the beginning of the academic year or academic term and days when students had tests. Thus, we worked with teachers to time the interventions to be administered immediately before an in-class

exam on the same day. Finally, we timed the interventions to occur earlier in the week (e.g., Tuesday or Wednesday) when students were fresh and when any positive recursive effects initiated (e.g., strong performance on one exam leading to more confidence and better performance on the next) would not be interrupted by the weekend.

There were some minor differences in treatment timing between the grade levels arising from pragmatic considerations associated with carrying out research so that the tasks were not repetitive for participants. Whereas 6th and seventh graders received four treatments over a period of 1 year, eighth graders received five treatments over the a period of 1.5 years that included the second half of the previous school year (when they had been seventh graders).

**Measurement of academic performance.** Students and parents both signed release forms for students’ official transcripts. These released students’ official grades, as well as their GPA and state achievement test scores from the year prior to the commencement of the intervention. We examined grades in core courses: two that related to STEM (Science, Technology, Engineering, and Mathematics), that is, math and science, and two that related to humanities and history, that is, language arts and social studies. The effects were generally consistent across both types of classes (see footnote 11 for results on STEM courses for combined Study 1 and Study 2 samples). These core courses were the same courses that were examined in Cohen et al. (2006, 2009) and comprise what is seen as the core curriculum in virtually all American education circles (e.g., math, science, English/Language Arts, and social studies/civics/history; e.g., Ravitch, 2010). Two other factors motivated our focus on these courses. First, they were courses that all students took, whereas elective courses varied across students. Second, core courses are more consistently stereotype relevant (i.e., relevant to intellectual ability) than elective courses (e.g., shop, physical education, art).

## Results

**Preliminary analytic issues.** Grades were calculated on a 4.33 scale (with F = 0, D- = .67, D = 1.0, D+ = 1.33, C- = 1.67, C = 2.0, C+ = 2.33, B- = 2.67, B = 3.0, B+ = 3.33, A- = 3.67, A = 4.0, A+ = 4.33). Participants received independent quarterly grades at four points of the school year. In each quarter, grades in the core subjects showed strong reliability:  $\alpha_{\text{Quarter1}} = .86$ ,  $\alpha_{\text{Quarter2}} = .85$ ,  $\alpha_{\text{Quarter3}} = .84$ , and  $\alpha_{\text{Quarter4}} = .85$ , and so were averaged into a global core-course GPA. A number of participants ( $N = 53$ ) completed a remedial reading course, and these grades were also included in participants’ average, when applicable (excluding this course does not affect the results). We obtained two pieces of data pertaining to participants’ academic perfor-

<sup>2</sup> The values for the first intervention were Enjoying Sports, Being Good at Art, Being Creative, Being Independent, Living in the Moment (or Enjoying Today), Belonging to a Social Group (such as your community, racial group, or school club), Listening to Music or Playing Music, Following Politics or Government, Being with Friends or Family, Being Religious, and Having a Sense of Humor. The values for the second intervention were Being Good at Art, Being Good at Sports, Being Smart or Getting Good Grades, Having a Sense of Humor, Being Creative, Being Religious, Being Independent, Being with Friends or Family, Membership in A Social Group (such as your community, racial group, or school club), Following Politics, and Listening to Music or Playing Music.

mance prior to the intervention—core-course GPA and state achievement test scores from the previous school year; these two were highly correlated,  $r(184) = .73$ . This information was incorporated into the analyses below both to establish baseline performance and for use as covariates.<sup>3</sup> Finally, including participants' gender, and its interactions with ethnicity and condition in the model did not alter any of the effects reported across both studies; consequently, gender is not discussed further.<sup>4</sup>

Across both studies, for comparisons between two means, Cohen's  $d$  effect size was calculated as the adjusted mean difference divided by the raw pooled standard deviation for the sample. All reported means in text are adjusted means from the analysis of covariance (ANCOVA) with the adjusted standard errors for those means also in parentheses. The figures for the grade data provide both raw means and standard errors and adjusted means and standard errors.

**GPA over time.** We hypothesized that Latino American participants in the self-affirmation condition would be buffered against a negative trajectory in grades over the school year—evidence of the downward recursive process that affirmations were predicted to interrupt. To assess whether grades declined over the school year, linear contrast analyses were conducted on White and Latino American participants' GPA over five time points, from prior to the intervention to the end of fourth quarter of the focal year. GPA scores were subjected to a 2 (Participant ethnicity: Latino vs. White)  $\times$  2 (Affirmation status: Affirmation vs. Control)  $\times$  5 (Time: Pre-Intervention vs. Quarter 1 vs. Quarter 2 vs. Quarter 3 vs. Quarter 4) mixed-model ANCOVA, with repeated measures on the third factor. Covariates were included for participants' preintervention standardized test scores, mean-centered on 0 for each ethnic group, and two dummy-coded variables to control for students' grade level (sixth, seventh, or eighth grade).<sup>5</sup>

The analysis yielded a significant main effect of ethnicity,  $F(1, 177) = 185.54, p < .001, d = 1.15$ , which indicated that the overall GPA of Latino Americans ( $M = 2.56, SE = 0.05$ ) was significantly lower than the GPA of Whites ( $M = 3.43, SE = 0.04$ ). There was a linear main effect of time,  $F(1, 177) = 38.29, p < .001$ , which indicated that for the sample as a whole, GPA declined in a linear fashion over the course of the five time points ( $M_s = 3.12_{PRE}, 3.04_{Q1}, 2.96_{Q2}, 2.95_{Q3}, 2.91_{Q4}; SE_s = 0.03_{PRE}, 0.04_{Q1}, 0.04_{Q2}, 0.04_{Q3}, 0.04_{Q4}$ ). There were significant two-way interactions between time and ethnicity,  $F(1, 177) = 14.16, p < .001$ , and between condition and ethnicity,  $F(1, 177) = 3.91, p < .050$ , but these effects were qualified by a significant three-way interaction (Time  $\times$  Condition  $\times$  Ethnicity),  $F(1, 177) = 5.39, p = .021$ . Figure 1 depicts this interaction.

The overall pattern of means was consistent with the hypothesis that affirmations deflected the negative trajectory in grades among Latino Americans but had no effect among Whites. To decompose the interaction, simple effects tests compared the effect of affirmation status on the linear trend for each ethnic group. These and all subsequent simple effects tests used the overall error term from the omnibus test. Most important, Latino American students displayed a steeper downward slide in GPA over the school year in the control condition ( $M_s = 2.74_{PRE}, 2.50_{Q1}, 2.41_{Q2}, 2.38_{Q3}, 2.27_{Q4}; SE_s = 0.07_{PRE}, 0.08_{Q1}, 0.09_{Q2}, 0.08_{Q3}, 0.08_{Q4}$ ) than in the affirmation condition ( $M_s = 2.77_{PRE}, 2.71_{Q1}, 2.66_{Q2}, 2.62_{Q3}, 2.54_{Q4}; SE_s = 0.07_{PRE}, 0.08_{Q1}, 0.09_{Q2}, 0.07_{Q3}, 0.08_{Q4}$ ),  $F(1, 177) = 5.41, p = .021$ . By contrast, among White students, the downward

trend in grades did not differ between the control condition ( $M_s = 3.49_{PRE}, 3.50_{Q1}, 3.41_{Q2}, 3.41_{Q3}, 3.47_{Q4}; SE_s = 0.06_{PRE}, 0.07_{Q1}, 0.08_{Q2}, 0.07_{Q3}, 0.07_{Q4}$ ) and the affirmation condition ( $M_s = 3.47_{PRE}, 3.46_{Q1}, 3.35_{Q2}, 3.40_{Q3}, 3.35_{Q4}; SE_s = 0.06_{PRE}, 0.07_{Q1}, 0.08_{Q2}, 0.07_{Q3}, 0.07_{Q4}$ ),  $F(1, 177) = 0.77, p = .380$ .

Moreover, in the control condition, Latino Americans showed a sharper decline in grades over the school year than did Whites,  $F(1, 177) = 18.48, p < .001$ . However, for students in the affirmation condition, Latino American students did not decline more rapidly than White students,  $F(1, 177) = 1.06, p = .304$  (see Figure 1), as affirmation deflected their trajectory upward. In sum, Latino American participants in the affirmation condition were buffered against the steep downward slide in grades found espe-

<sup>3</sup> For all students, these baseline academic performance measures tapped performance *prior* to the intervention. This meant, for the current sixth graders, fifth grade data were used; for the seventh graders, sixth grade data. For the eighth graders, grades from the first quarter of seventh grade and state achievement test scores from sixth grade were used. This was because these students had, as seventh graders, been randomly assigned to either the affirmation or control condition halfway through the year (near the end of the second quarter), an assignment that, as noted previously, was preserved when these students moved to the eighth grade. (It should also be noted that the key analytic results are virtually identical when the eighth grade cohorts' post intervention time points are expanded to include their GPA from the two final quarters of seventh grade.) To verify that random assignment was successful and that preintervention performance did not differ by condition, we conducted separate 2 (Condition)  $\times$  2 (Ethnicity) ANOVAs on preintervention GPA and preintervention test scores, respectively. The analyses revealed only main effects of ethnicity, as White students performed better than Latino American students ( $ps < .001$ ). Most important, there were neither main effects nor interactions involving condition ( $F_s < 0.70, ns$ ). Last, to examine whether the preintervention performance-relevant covariate met the assumption of homogeneity of variance, we ran multiple regressions in both studies with the preintervention covariate, all two-way interactions, and the three-way preintervention Covariate  $\times$  Condition  $\times$  Ethnicity interaction (all predictors mean-centered on zero). The correlation between the preintervention covariate and cumulative GPA did not vary by condition, as in neither study was the three-way interaction, nor the two-way preintervention Covariate  $\times$  Condition interaction significant ( $ps > .10$ ). The one trend was that in Study 1, the three-way interaction trended at ( $p = .107$ ), such that condition effects tended to be stronger for high- rather than low-performing Latino Americans. Importantly, the key Ethnicity  $\times$  Condition interaction effects are virtually identical in both studies with the full model that includes two- and three-way interactions involving the preintervention covariate.

<sup>4</sup> There was evidence that affirmation benefited girls in the sixth grade. The role of affirmation in helping to buffer girls during the adolescent transition is a topic to be addressed in a forthcoming report (Binning et al., 2012).

<sup>5</sup> The within-ethnicity covariate adjustment was done to avoid statistically equating Latino Americans and Whites along their baseline performance, which could give the misleading impression when examining the covariate-adjusted means that there was a smaller achievement gap than really existed (see Sackett, Hardison, & Cullen, 2004). Doing otherwise (i.e., using the raw covariate) yielded virtually identical condition effects and Condition  $\times$  Ethnicity interaction effects across both studies. In addition, we examined whether there were main effects or interactions involving grade level, so we included grade as a three-way factor (sixth vs. seventh vs. eighth) in the ANCOVA. There was a main effect of grade,  $F(1, 171) = 45.35, p < .001$ , such that sixth graders ( $M = 3.36, SE = 0.05$ ) had higher grades than seventh ( $M = 2.81, SE = 0.04$ ) and eighth graders ( $M = 2.79, SE = 0.05$ ). However, there were no interactions involving grade levels ( $F_s < 1.40, ps > .24$ ), indicating that grade level did not moderate the key ethnicity  $\times$  affirmation interaction. Note, however, that all students received the first intervention exercise in the first half of middle school, so we do not yet know the effects of intervening late in middle school (eighth grade).

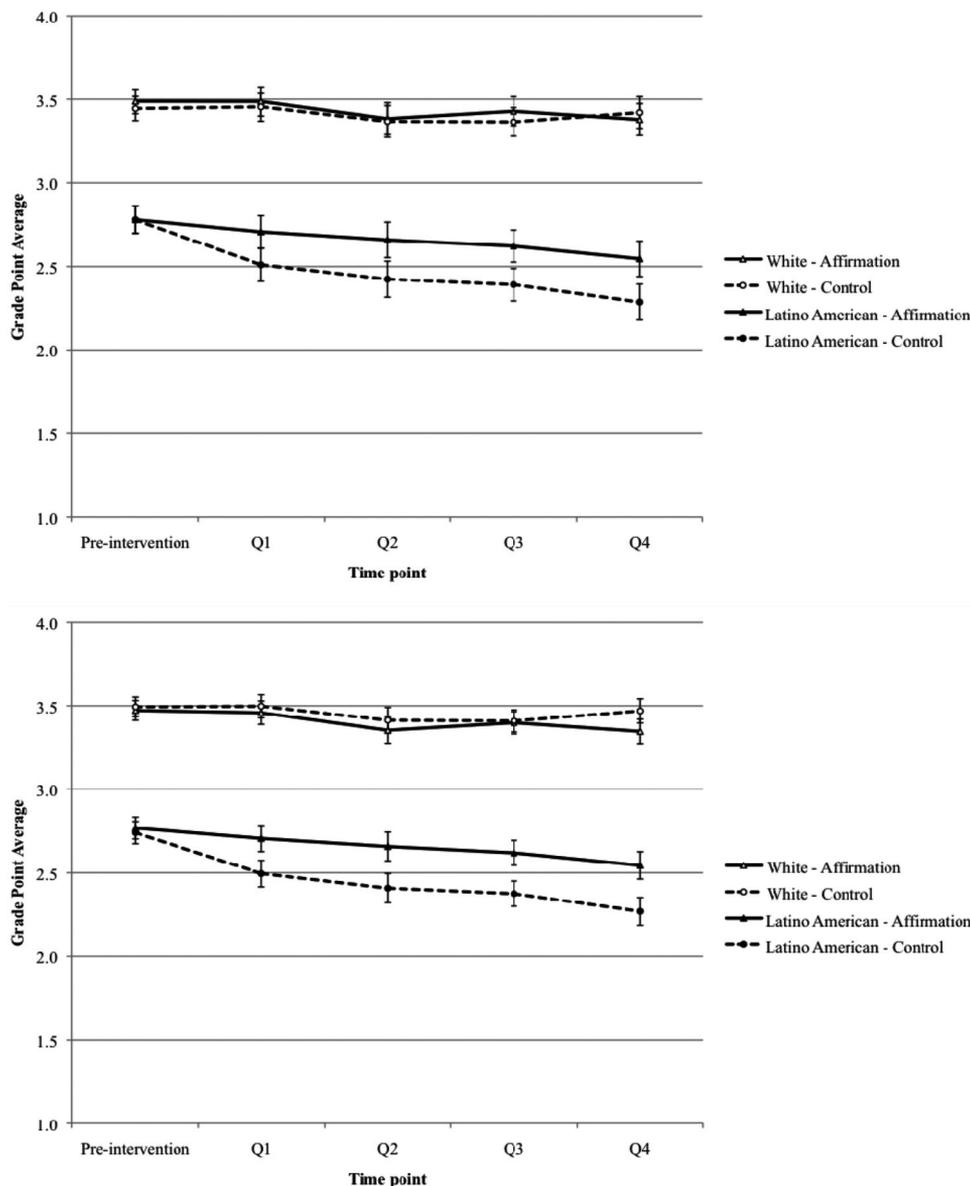


Figure 1. From Study 1, performance across school year as a function of ethnicity and condition, with both raw means and error terms (top) and means and error teams adjusted for baseline covariates and grade level (bottom). Error bars represent  $\pm 1$  standard error. The y-axis represents the grade point average metric, ranging from 0 (F) to 4.33 (A+). Q = quarter.

cially among Latino American participants in the control condition. In other words, the achievement gap grew over time in the control condition but did not in the affirmation condition.

Next, we conducted an ANCOVA on the estimated grades for just the fourth quarter to examine how the students performed at the very end of the school year, the time period that likely focused on the most difficult material. As expected, the Ethnicity  $\times$  Condition interaction was significant,  $F(1, 177) = 7.63, p = .006$ . The GPA of affirmed Latino American students was higher ( $M = 2.53, SE = 0.07$ ) than the GPA of Latino American students in the control group ( $M = 2.28, SE = 0.07$ ),  $F(1, 177) = 7.33, p = .007, d = 0.30$ . The GPA of affirmed White students ( $M = 3.36,$

$SE = 0.06$ ) was not different than the GPA of White students in the control condition ( $M = 3.46, SE = 0.06$ ),  $F(1, 177) = 1.23, p = .27$ . These findings suggest that the affirmation effect among Latino Americans strengthened as academic difficulty increased.

**Cumulative GPA: End of Year 1.** To obtain a general picture of academic performance over the whole year, we computed participants' cumulative core-course GPA during the academic year in which the study was conducted (by averaging the four quarterly GPAs). To control for preintervention academic performance while minimizing missing data, preintervention GPA and preintervention state achievement test scores were transformed to

Z-scores, averaged into a single composite (they were, as noted, highly correlated), and the composite mean-centered on 0 for each ethnic group (see footnote 5). Participants for whom preintervention performance data were unavailable ( $N = 4$ ) were assigned the preintervention mean of their ethnic group (which was zero). Cumulative GPA was then subjected to a 2 (Participant ethnicity: Latino vs. White)  $\times$  2 (Affirmation status: Affirmation vs. Control) between-subjects ANCOVA, using preintervention performance and two grade dummy-codes to account for student grade level (sixth, seventh, and eighth) as covariates. Latino American students overall ( $M = 2.51$ ,  $SE = 0.04$ ) had a lower GPA than White students ( $M = 3.42$ ,  $SE = 0.04$ ),  $F(1, 177) = 297.47$ ,  $p < .001$ ,  $d = 1.20$ . Affirmed students overall ( $M = 3.01$ ,  $SE = 0.04$ ) had a somewhat higher GPA than students in the control condition ( $M = 2.92$ ,  $SE = 0.04$ ),  $F(1, 177) = 3.43$ ,  $p = .066$ ,  $d = 0.12$ . Most important, the hypothesized two-way interaction between ethnicity and affirmation condition emerged,  $F(1, 177) = 5.90$ ,  $p = .016$ .

Affirmed Latino American students ( $M = 2.62$ ,  $SE = 0.06$ ) had a higher GPA than unaffirmed Latino American students ( $M = 2.40$ ,  $SE = .06$ ),  $F(1, 177) = 8.18$ ,  $p = .005$ ,  $d = 0.29$ . Among Whites, by contrast, GPA did not vary between the affirmation condition ( $M = 3.40$ ,  $SE = 0.05$ ) and control condition ( $M = 3.44$ ,  $SE = .05$ ),  $F(1, 177) = 0.19$ ,  $p = .665$ . To estimate the reduction in achievement gap in the two conditions, we subtracted the mean GPA of Latino American students in each condition from the overall mean GPA of White students and compared the two difference scores. Doing so indicates that the affirmation reduced the achievement gap from 1.02 to 0.80 for covariate-adjusted means for a 21.5% reduction, and from 0.98 to 0.74 for raw means, a 24.5% reduction.

**Cumulative GPA: End of Year 2.** Although no subsequent affirmation manipulations were administered after the first academic year, students' transcripts from the following school year were collected to examine whether the affirmation effect for Latino Americans persisted. We included participants who either continued to attend the middle school where the intervention took place or who transitioned into the primary high school that the middle school fed into. 170 students met these inclusion criteria (123 students in middle school, and 47 were now in high school) and 14 students did not (nine Latino American and five White; eight control and six affirmation). A chi-square analysis revealed somewhat greater attrition for the Latino American participants (11.1%) than White participants (4.9%),  $\chi^2(1, N = 184) = 2.53$ ,  $p = .11$ . But there was no difference as a function of condition within each ethnicity, White  $\chi^2(1, N = 103) = 0.23$ ,  $p = .631$ ; Latino American  $\chi^2(1, N = 81) = 1.21$ ,  $p = .271$ . Thus, the majority of the sample was preserved, and there was no differential attrition by condition.

We tested whether the affirmation effect on cumulative GPA at the end of Year 2 among Latino Americans would persist into the following school year, when eighth graders had graduated and begun attending high school. To test whether the effect persisted into high school, we used a multiple regression approach that allowed for tests of targeted contrasts between different grades as well as between middle school and high school, and the interactions of these variables with ethnicity and condition (Judd, McClelland, & Ryan, 2008). First, to capture the three grade levels, we coded the grade variable into two orthogonal contrasts. Con-

trast 1 controlled for the difference between seventh and eighth grade (i.e., seventh grade = -1; eighth grade = 1; ninth grade = 0), while Contrast 2 contrasted the ninth grade high school students (ninth grade = 2) against the two middle school grades (seventh and eighth grades = -1). Contrast 2 was then included as a full factor in a three-way linear regression analysis to test the moderating role of school level (Affirmation Status  $\times$  Ethnicity  $\times$  School Level). On Step 1 of the analysis, we included the preintervention performance variable (ethnic mean centered) and Contrast 1 as control variables. On Step 2, we entered the main effect terms for affirmation status, ethnicity, and school level (Contrast 2). On Step 3, we entered the three two-way interaction terms among the Step 2 variables (i.e., Affirmation Status  $\times$  Ethnicity; Affirmation Status  $\times$  School Level; Ethnicity  $\times$  School Level). And on Step 4, we entered the critical three-way interaction term (Affirmation Status  $\times$  Ethnicity  $\times$  School Level). As described below, the affirmation effect among Latino Americans persisted into the following school year and was not moderated by the move to high school.

Step 1 revealed a significant main effect of prior performance, such that higher preintervention performance predicted higher Year 2 GPA,  $B = .72$ ,  $SE = .09$ ,  $t(167) = 8.03$ ,  $p < .001$ . Contrast 1 was not significant,  $B = -.05$ ,  $SE = .07$ ,  $t(167) = -0.76$ ,  $p = .451$ , indicating no difference in GPA between seventh and eighth grade students. Step 2 revealed a marginal effect for affirmation status, such that affirmed participants had higher GPA than non-affirmed participants,  $B = .08$ ,  $SE = .04$ ,  $t(164) = 1.97$ ,  $p = .051$ , and a main effect for ethnicity, such that White students had higher GPA than Latino American students,  $B = -.58$ ,  $SE = .04$ ,  $t(164) = -14.93$ ,  $p < .001$ . There was also a main effect for school level, such that middle school students had higher GPA than high school students,  $B = -.14$ ,  $SE = .03$ ,  $t(164) = -4.97$ ,  $p < .001$ . Step 3 revealed that the Participant Ethnicity  $\times$  Affirmation Status interaction was significant,  $B = .09$ ,  $SE = .04$ ,  $t(161) = 2.41$ ,  $p = .017$ , demonstrating that the affirmation effect among Latino Americans carried on into the following year.

Latino Americans in the affirmation condition had a higher Year 2 GPA ( $M = 2.09$ ,  $SE = 0.09$ ) than Latino Americans in the no-affirmation condition ( $M = 1.70$ ,  $SE = 0.09$ ),  $t(161) = 3.14$ ,  $p = .002$ ,  $d = 0.43$ . Moreover, the condition effect among Latino Americans was seen among both middle school students ( $M_s = 2.30$  vs.  $1.93$ ,  $d = 0.41$ ) and high school students ( $M_s = 1.91$  vs.  $1.57$ ,  $d = 0.37$ ). By contrast, there was no difference between White participants in the affirmation ( $M = 3.11$ ,  $SE = 0.08$ ) and the no-affirmation condition ( $M = 3.09$ ,  $SE = 0.08$ ),  $t(161) = 0.20$ ,  $p = .840$ . Finally, indicating that the Ethnicity  $\times$  Affirmation interaction did not depend on school level, the three-way term was not significant in the final step of the regression,  $B = -.02$ ,  $SE = .03$ ,  $t(160) = -0.79$ ,  $p = .431$ . The affirmation effect carried into the following school year, even among students that transferred to high school.

In summary, the effects of the affirmation intervention persisted one full year after the last experimental administration, as Latino American students' covariate-adjusted GPA was 0.39 points higher in the affirmation condition than in the control condition (0.35 points for raw GPA). Surprisingly, given that intervention effects may often decay with time, the treatment effect among Latino Americans was somewhat larger in Year 2 ( $d = 0.43$ ) than

in Year 1 ( $d = 0.29$ ), even though the intervention had ended the previous year.

**Cumulative GPA: End of Year 3.** To examine whether affirmation effects continued to persist, grades were collected for the following school year, now two school years after the affirmation intervention had ended. Students who had begun the study as sixth graders were now in eighth grade in middle school ( $N = 48$ ), with the seventh and eighth graders now in ninth and 10th grade in high school ( $N = 100$ ), respectively. Thus, the study now permits an examination of whether the effects persist when the majority of participants have entered high school. An attrition analysis from the end of Year 1 to the end of Year 3 found there was no systematic attrition as a function of ethnicity,  $\chi^2(1, N = 184) = 2.42, p = .12$  (24.7% of Latino American students and 15.5% of White students did not complete Year 3). Moreover, there was no significant attrition difference as a function of condition within each ethnicity (Latino American  $\chi^2(1, N = 81) = 2.59, p = .107$ ; White  $\chi^2(1, N = 103) = 1.28, p = .258$ ). In summary, although 36 students were lost to attrition, it was not systematic across conditions.

Using the same strategy to test for continuity of the effects into high school as used above, two orthogonal contrasts were created. Contrast 1 captured the difference between ninth ( $-1$ ) and 10th ( $1$ ) graders (eighth graders =  $0$ ), whereas Contrast 2 captured the difference between high school (ninth and 10th grades =  $1$ ) and middle school (eighth grade =  $-2$ ). The remainder of the analysis followed the logic and structure as the Year 2 analysis, yielding very similar results.

On Step 1, main effects were uncovered for prior-performance,  $B = .79, SE = .11, t(145) = 7.19, p < .001$ , and for Contrast 1,  $B = .30, SE = .09, t(145) = 3.33, p = .001$ , the latter of which indicated that 10th graders had a higher end of year GPA than ninth graders. Unlike above, Step 2 did not reveal a main effect for affirmation status,  $B = .03, SE = .05, t(142) = 0.65, p = .516$ , but, as above, it did reveal a main effect for ethnicity,  $B = -.68, SE = .05, t(142) = -14.20, p < .001$ , and for school level,  $B = -.21, SE = .03, t(142) = -6.22, p < .001$ , which indicated, respectively, that White students and middle school students had higher grades than Latino American students and high school students. Step 3 revealed a significant Affirmation Status  $\times$  Ethnicity interaction,  $B = .10, SE = .05, t(139) = 2.09, p = .038$ .

Latino Americans in the affirmation condition continued to show improved performance, as the GPA of Latino Americans was marginally higher in the affirmation condition ( $M = 1.92, SE = 0.10$ ) than in the no-affirmation condition ( $M = 1.67, SE = 0.11$ ),  $t(139) = 1.73, p = .087, d = 0.24$ . As above, the benefit for affirmed Latino Americans was apparent in middle school ( $M_s = 1.99$  vs.  $1.85, d = 0.13$ ) and in high school ( $M_s = 1.76$  vs.  $1.40, d = 0.34$ ). By contrast, there was no difference in the GPA between White participants in the affirmation ( $M = 3.12, SE = 0.10$ ) and the no-affirmation condition ( $M = 3.27, SE = 0.09$ ),  $t(139) = 1.15, p = .251$ . Finally, the three-way interaction term entered on Step 4 was not significant,  $B = -.001, SE = .03, t(138) = -0.02, p = .981$ , which indicated that the Affirmation Status  $\times$  Ethnicity interaction did not vary as a function of school level. The effects of the values affirmation delivered in middle school persisted into a third year, and for many participants into a new school environment, high school.

## Discussion

Study 1 provides the first demonstration that an affirmation intervention benefits the grades of Latino American adolescents. The findings echo the findings in prior studies with African American and White middle school students (Cohen et al., 2006, 2009). While the experimental manipulation had no significant effects on White students, it led to higher grades for Latino American students. Moreover, the effects of the affirmation intervention persisted for 3 years, the period of observation; that is, the affirmation effect on Latino Americans' GPAs did not decay when the intervention ceased. The effect size remained generally consistent over time, though by the third year, the effect was marginally significant. This was most likely because attrition lessened statistical power, as the condition effect size for Latino Americans was consistent with those observed during previous years. The affirmation persisted despite the significant and presumably challenging change in ecology (for most students in the sample) from middle school to high school (Bronfenbrenner, 1977).

During the first year of the study, the negative trajectory in GPA among Latino American students in the control condition was much steeper than the downward trend among White students and among affirmed Latino American students. This finding suggests that in the absence of affirmation a recursive process occurs whereby the threat that accompanies negative performance among minority students compounds over time, leading to a steeper downward trajectory (Cohen et al., 2009). However, affirmation appears to have interrupted this recursive process, as evidenced by the finding that it lifted the trajectory of Latino American students' performance upward so that it did not differ from the trajectory of White students. We turn next to a study that seeks not only to replicate the findings on grades from Study 1 in a similar sample but also to examine the psychological effects of identity threat and values affirmation.

## Study 2

There have been recent advances in understanding the process by which self-affirmations reduce defensiveness (Sherman & Cohen, 2006), improve academic performance (Cohen et al., 2009), increase acceptance of health information (Harris & Epton, 2009, 2010), and affect other outcomes. Different researchers have focused on factors such as the bolstering of self-control when executive resources are depleted (Schmeichel & Vohs, 2009), and increasing positive emotions toward others (Crocker et al., 2008). A multistage model of self-affirmation effects has been proposed in recent reviews of the affirmation literature (Sherman, 2012; Sherman & Hartson, 2011). In Study 2, we derived several predictions from this model that inform how self-affirmation affects the trajectory of identity threat over time.

We hypothesize that identity threat may change the narratives students formulate about their experience in school. First, they are expected to be more attentive to the concrete rather than abstract—as vigilance may require them to keep a look-out for telltale signs that a stereotype is in play. This should be reflected in differing levels of construal (Trope & Liberman, 2010). By contrast, when people write about core personal values, they tend to view experience from a broader (i.e., more abstract) perspective. Because they are reminded of who they fundamentally are and what is of enduring significance to them (Sherman & Cohen,

2006), they can pull back and see the situation from more of a bird's eye perspective. Indeed, recent research suggests that focusing on central self-relevant values leads people to form broad and abstract conceptualizations of experience. In the language of construal level theory, affirmation leads to a tendency to generate high-level construals focused on central and defining aspects of experience rather than low-level construals focused on subordinate, incidental aspects (Wakslak & Trope, 2009; Schmeichel & Vohs, 2009). For example the act of test-taking may be viewed as "filling out answers" from a low level of construal, whereas it could be seen as "demonstrating knowledge" from a high level of construal (Vallacher & Wegner, 1989).

In the present study, we explore whether Latino American participants, who may experience identity threat in school, see situations and events at a lower level of construal than those participants not under threat, and whether their level of construal broadens when they are affirmed, as assessed by an adapted version of the Behavioral Identification Form (BIF; Vallacher & Wegner, 1989). Moreover, we assessed construal levels at several time points late in the academic year to examine whether the affirmation led to changes in perspective.

Second, those experiencing identity threat may see adversity not as an isolated event but as symbolic and as suggesting that their ethnic group identity matters and could affect their outcomes. Thus there should be a relatively strong within-person correlation between their day-to-day academic adversity and their day-to-day sense of being under identity threat. Further, to the extent that they perceive such identity threat in their environment, this in turn could undermine their felt belonging and thriving in school. Because race, gender, ethnicity, and many other group identities are both visible and fixed, if students feel that they are prejudged based on their group rather than on their merits, they may question whether they will be able to fit in in school—and whether other important figures in their academic environment will see them as fitting in. This may be especially true in the early formative stages of an academic transition, such as the transition to middle school, when students are forming expectations for their future prospects in a new environment.

Thus, in educational contexts, students may see negative feedback, or a poor score on an exam, as evidence that a stereotype has been applied to them, and thus, that they have reason to withdraw (Aronson & Inzlicht, 2004; Cohen, Steele, & Ross, 1999; Walton & Cohen, 2007). Although minority students may adopt coping strategies that help them cope with prejudice (Crocker & Major, 1989; Nussbaum & Steele, 2007), their psychological state may still be relatively more situationally contingent in arenas of chronic identity threat, as an initial incident of threat could make subsequent threats more likely. By contrast, when students experiencing potential threat engage in a values affirmation, in which they focus on core values like "relationships with friends and family" or "religion" and therefore buttress their narratives of adequacy, we predict that they will be better able to pull back and see events from a broader and higher level of construal (Wakslak & Trope, 2009). Better able to pull back and see situational threat in a broader perspective, a particular stressor may be seen as less reflecting a threatened identity such that specific situational threats will be "decoupled" or "untethered" from concerns of identity, and hence, less psychologically disruptive (Sherman & Hartson, 2011;

Sherman & Kim, 2005; Cook et al., 2012; see also Vohs, Park, & Schmeichel, in press; Voisin, Brick, Vallée, & Pascual, 2012).

To examine whether the self-affirmation intervention can lead to such psychological outcomes, we assessed students' perceptions of daily adversity, identity threat, and feelings of academic fit multiple times over the school year to obtain an in-vivo account of how students perceived events on a day-to-day basis and their interrelationship. Such diary assessments reflect narratives of ongoing experience and can potentially illuminate how affirmation shapes the way people explain the events of their lives. This is important because for affirmation to have long-term effects, it seems likely that it does not change an individual perception of events, but rather shapes a continuing and self-reinforcing outlook with a theme ("I possess these important values and therefore my self-integrity is not at risk") that helps put adversity in a more optimistic context ("things are okay") rather than a pessimistic one ("people stereotype me here").

Study 2 thus leverages the diary measures to assess the degree to which participants apply a temporally consistent theme to their narratives of ongoing experience. To summarize the predictions for the psychological measures: We predict that unaffirmed Latino American students will perceive events in general at a lower level of construal. Additionally, to the extent that they are vigilant to identity threat, there should be a relatively strong correlation between daily adversity and perceptions of identity threat, and additionally, between identity threat and academic motivation. By contrast, participants who had a narrative of self-integrity shored up by the affirmation should be able to construe daily adversity as less relevant to their ongoing social identities. Moreover, they should not globalize identity-threatening experiences, when they occur, into a general conclusion that they do not "belong" in school.

## Method

The middle school research site for Study 2 is similar in some ways to the middle school in Study 1. As in Study 1, the middle school was ethnically diverse with (at the time of the study) approximately 39% of students identified as Latino American or Hispanic, and 42% identified as White, according to school records. This middle school had approximately 35% of students receiving meal assistance. In addition, approximately 15% of students were identified as English learners. Unlike Study 1, the middle school under investigation in Study 2 housed only Grades 7 and 8. In Study 2, there were two writing exercises (vs. four to five in Study 1), and the study focused only on seventh graders (vs. the entire school). Permission slips were sent home to parents and the children received gift certificates for returning them regardless of whether their caretakers declined or assented to their participation.

**Participants.** The final sample consisted of 185 seventh grade students (93 male, 92 female; 96 White, 55 Hispanic/Latino American, three Black/African American, 29 Asian/Asian American, and two other; ethnicity determined by official school records). A total of 365 permission slips were distributed, and 291 were returned (80%). Of those who returned the permission slips, 80% received consent to participate ( $N = 234$ ), and from this group, 80% ( $N = 187$ ) were present in class for each of the two writing exercises. As in Study 1, inclusion criteria restricted analyses to

students who (a) completed two writing exercises and (b) received a core-course cumulative GPA within three studentized residuals of the mean estimated from the analytic model ( $N = 2$  excluded in Study 2; of the two outliers, one also had incomplete grades while the other had complete grades). In all cases except one (noted in footnote) the significance of the data remains the same with inclusion of outliers. Also as in Study 1, the median age was 12 years old at the start of the school year, and only White ( $N = 96$ ) and Latino American ( $N = 55$ ) students had samples large enough to analyze and are thus the focus of the results below.

Attrition analyses indicate that while there was somewhat greater attrition for the Latino participants (28.6%) than the White participants (19.3%),  $\chi^2(1, N = 196) = 2.26, p = .13$ , importantly, there was no difference as a function of condition within each ethnicity, White  $\chi^2(1, N = 119) = 2.22, p = .14$ ; Latino American  $\chi^2(1, N = 77) = 0.05, p = .83$ . The vast majority of the attrition was due to student absence on one of the writing assignment days; additionally three participants (two White, one Latino) received incorrect (i.e., conflicting) condition assignments at the second writing task.

In Study 2, we obtained sample information on parental origin as the children reported the country where they and each parent were born. Most of the White participants were born in the United States (91% reported United States as country of birth), and their parents were both born in the United States (76% reported their mothers were born in the United States, 84% reported their fathers were born in the United States). The Latino American participants were also predominantly born in the United States (75% reported United States as country of birth, 16% Mexico). However, most of their parents were born in Mexico (67% reported their mothers were born in Mexico, 71% percent reported their fathers were born in Mexico). Among the focal ethnic groups, 151 met the inclusion criteria and are thus in the final sample. Seventy-two participants were randomly assigned to the affirmation condition (46 White, 26 Latino American), and 79 participants were randomly assigned to the control condition (50 White and 29 Latino American).

**Procedure overview.** Figure 2 presents a timeline to outline the multiple components of the yearlong study.

**Pretest survey.** At the start of their seventh grade year, and before the commencement of the affirmation intervention, participants completed a pretest survey that included demographic questions as well as various self-report scales. Additionally, partly because preintervention GPA was unavailable for these students, a

three-item measure was included to assess the extent to which participants cared about academics and performed well in school (adapted from Harter, 1990). Participants indicated on 6-point scales, anchored at 1 (*Very Much Disagree*) and 6 (*Very Much Agree*), the extent to which they agreed with the statements, “I am the kind of person that does well in my school,” “It’s important for me to be smart,” and “It’s important for me to do well at school.” This three-item composite was used as an index of academic identification ( $\alpha = .65$ ). Other pretest items will be introduced in the combined Study 1 and Study 2 section where we examine moderators of treatment effects.

**Affirmation manipulation.** Based on the condition to which they were randomly assigned, all participants completed either the values affirmation or the no-affirmation control writing task twice during the school year, once approximately 1 month into the school year and a second time approximately 1 month prior to the end of the school year. Teachers administered these exercises, adapted from the two structured value affirmation activities in Study 1 and from Cohen et al. (2009), in personalized envelopes as part of regular classroom activities. Teachers introduced the activities as a “short writing exercise” using scripts similar to those described in Study 1.

**Assessments of construal.** To assess construal, participants completed modified versions of the BIF (Vallacher & Wegner, 1989), a standard measure where participants are asked to consider how a number of activities could be construed. The BIF presents behaviors and asks participants to choose which description of the two presented that “best describes the task for you.” For example, participants were presented behaviors, e.g., “Surfing the Internet” and asked to circle a letter indicating whether “Looking at a computer screen” (a low level of construal) or “Acquiring information” (a high level of construal) best described the task for them. We modified the original BIF, created additional items in the same format as the original BIF and used a pool of 60 items (see A. A. Marsh et al., 2010, for some additional items) covering a broad range of activities (only seven of the 60 were academic) so that the language used for the items was appropriate for children. The dependent variable was the percentage of high construal items chosen.

To obtain a reliable measure of level of construal for as many participants as possible, we included multiple assessments for those participants we could. We also ensured that no single BIF item was completed more than once by any given participant. We

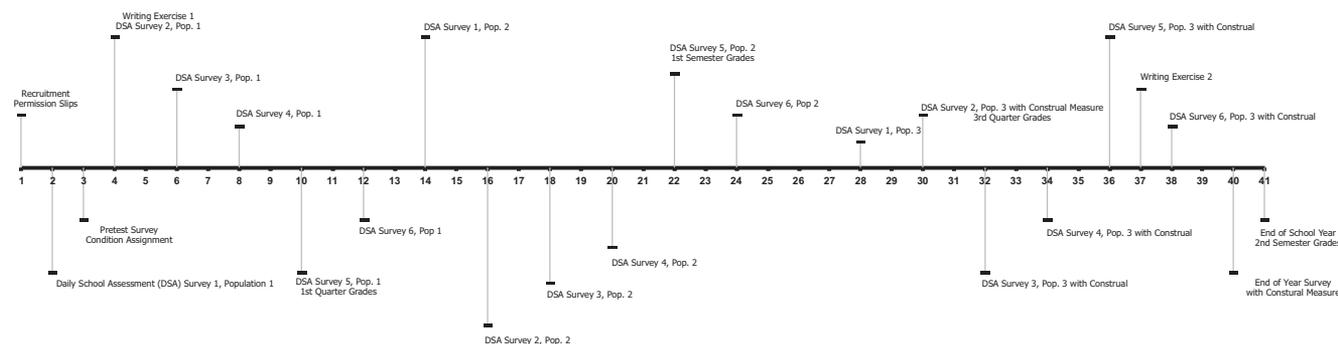


Figure 2. Study 2 timeline in weeks of the school year. DSA = Daily Survey Assessment; Pop. = population.

had two opportunities to assess construal, which provided us with two samples. Sample 1 was assessed in health class during spring quarter and Sample 2 was assessed during the end-of-year mass testing session to get those students who were not in health in spring quarter. Sample 1 completed five assessments that occurred approximately every 2 weeks (every student completed four or five; Daily Survey Assessment [DSA] with construal Population 3 in Figure 2). We allocated the 60 BIF items over the five sessions; they received 10-item BIFs (the first 4 weeks) and one 20-item BIF (the last week). This sample consists of 44 participants, 26 in the affirmation condition (16 White and 10 Latino American) and 18 in the control condition (11 White and 7 Latino American).

Sample 2 (roughly two thirds of the final sample) occurred during the survey at the end of the year in a large mass testing room. This enabled us to sample the students who did not complete the BIF as part of the health class. In order to streamline the BIF, we reduced it from 60 items to 20 for this sample and to craft a measure that would yield useful variance, we selected items that yielded responses (from the health class assessment) that were evenly distributed (i.e., about 50% of the students had chosen higher construal). We eliminated participants who had already completed the BIF items earlier in the year during health class. This end-of-year sample consisted of 91 participants, 41 in the affirmation condition (26 White and 15 Latino American) and 50 in the control condition (33 White and 17 Latino American). Finally, we combined these two samples so that we had one BIF percentage score representing the proportion of higher construal items chosen for 135 participants.

**Assessments of daily adversity, identity threat, and academic fit.** Participants completed up to six short DSAs (see Figure 2) every other week of their health classes that tapped their daily school feelings and self-perceptions. (Health classes were the most convenient venue for the school for this aspect of the study.) To examine the coupling and decoupling process in students' daily assessments, participants reported in the survey on their daily adversity, identity threat, and sense of academic fit. As described later, these items emerged as three discrete factors. Because different students took health at different points throughout the school year, the sample was divided into three roughly equal groups of students who took the health class at three different times of the year, one group in the fall (Population 1), one in the winter (Population 2), and one in the spring (Population 3); see Figure 2.

In the survey, participants indicated their level of agreement with a series of statements using a 6-point scale anchored at 1 (*Very Much Disagree*) and 6 (*Very Much Agree*). The survey focused on how students experienced their environment that day. Three items measured levels of daily adversity (e.g., "Today I feel nervous about school" and "Today I feel stressed out at school";  $\alpha = .68$ ). Two identity threat items assessed the extent to which students worried about being judged in school based on their racial/ethnic group ( $\alpha = .75$ ): "Today in school, I am worried that other people might judge me based on my race" and "Today in school, I am worried that people will judge my race because of the way *other* kids in my racial group behave (Cohen & Garcia, 2005)." A remaining item did not correlate with the other items in this component and was thus not included in the identity threat composite. Perceptions of academic fit were assessed by measuring students' sense of "fit" in school (Walton & Cohen, 2007). This included felt belonging in school (sample item: "Today, I

really feel like I belong at [student's school]"; four-item measure;  $\alpha = .82$ ; Walton & Cohen, 2007), the degree to which they felt efficacious about succeeding in school (sample item: "Today, I feel like I can succeed in school"; four-item measure;  $\alpha = .81$ ; Bandura, 1997; Walton & Cohen, 2007), and the degree to which they felt proud of their school (sample item: "Today, I feel proud of being a student at (my school)"; five-item measure school pride;  $\alpha = .86$ ). Because these three academic subcomponents themselves yielded a highly reliable index ( $\alpha = .90$ ), we combined them into a scale of academic fit.

Over the school year, participants completed the scale described above up to six times. One hundred eighteen students completed between two and six of the daily survey assessments (DSA in Figure 2). We included in our final sample those participants who completed at least four diary entries (85% of the respondents). This is because our data analyses involved computing within-subject correlations between daily adversity, racial threat, and academic fit, and this required multiple observations for each subject to provide meaningful variance (e.g., a person with only two observations could have a computable correlation of only +1 or -1). This provided the most stable and consistent results across the days as the within-person associations become unstable with fewer days, and the number of participants who completed a fewer number of entries was not evenly distributed across the ethnicities (Latino Americans were more likely to have fewer entries; it did not vary by condition). The final diary sample consisted of 100 participants: 51 in the affirmation condition (33 White and 18 Latino American) and 49 in the control condition (34 White and 15 Latino American).

## Results

**Preliminary analytic issues.** Grades were calculated on the same 4.33 scale used in Study 1 and were based on official transcripts (released with parental consent). There were four quarters during the school year. Grades from the first two quarters constituted the fall semester grades. The final two quarters constituted the spring semester grades.<sup>6</sup> As in Study 1, we examined grades in the four core subjects that all students were required to take, the two STEM-related courses, Math and Science, and the two non-STEM-related courses, English and Social Studies. The alpha for each of the four reports showed high reliability ( $\alpha_{\text{Quarter1}} = .92$ ,  $\alpha_{\text{Semester1}} = .95$ ,  $\alpha_{\text{Quarter3}} = .91$ , and  $\alpha_{\text{Semester2}} = .94$ ), and the effects described below were generally consistent across both types of classes. When GPAs from the four core courses were not available for students ( $N = 1$  had grades in only three courses), the missing data were substituted with the student's mean GPA from the other courses.

Because we did not have students' prior year grades to use as a baseline measure (as in Study 1) and to control for prior perfor-

<sup>6</sup> More specifically, there were four report cards for the two semesters of the school year. One report card provided first semester GPA, the average of the first two quarters. Likewise, a final report card provided second semester GPA, the average of the third and fourth quarters. Two additional report cards provided first-quarter and third-quarter grades. The school did not provide report cards for second-quarter and fourth-quarter grades. Thus, for analysis of quarterly grades and linear trends, we had to estimate second and fourth quarter grades. We could do this algebraically because the semester grade was essentially an average of the previous two quarters.

mance, we used two covariates that we standardized and averaged into one composite. The first was the pretest measure of academic identification. The second covariate was the summed score of the prior year's state achievement test scores for English and Math. The correlation between the two covariates, identification and standardized test scores was  $r(121) = .26, p = .003$ . To obtain a baseline measure for the maximal number of participants, we standardized and averaged the two covariates, and mean-centered the covariate within ethnicity.<sup>7</sup>

**GPA over time.** We first examined how academic performance changed over the course of the year as a function of ethnicity and condition. GPA scores were subjected to a 2 (Participant ethnicity: Latino American vs. White)  $\times$  2 (Affirmation status: Affirmation vs. Control)  $\times$  4 (Time: Quarter 1 vs. Quarter 2 vs. Quarter 3 vs. Quarter 4) mixed-model ANCOVA, with repeated measures on the third factor and the aforementioned covariate. As in Study 1, the analysis yielded a linear main effect of time,  $F(1, 146) = 5.16, p = .025$ , indicating that for the sample as a whole, GPA declined in a linear fashion over the course of the four time points ( $M_s = 3.22_{Q1}, 3.15_{Q2}, 3.08_{Q3}, 3.13_{Q4}$ ;  $SE_s = 0.05_{Q1}, 0.06_{Q2}, 0.06_{Q3}, 0.07_{Q4}$ ). There was no significant two-way interaction between participants condition and time,  $F(1, 146) = 0.96, p = .33$ , but there was a significant interaction between participants ethnicity and time,  $F(1, 146) = 4.08, p = .045$ . This was qualified by the significant three-way Time  $\times$  Condition  $\times$  Ethnicity interaction,  $F(1, 146) = 6.13, p = .014$ . This interaction is depicted in Figure 3.

Latino Americans, as in Study 1, exhibited a steeper downward slide in performance over the course of the year in the control condition than the affirmation condition. That is, among Latino American participants there was a larger downward trend in the control condition ( $M_s = 2.61_{Q1}, 2.54_{Q2}, 2.44_{Q3}, 2.27_{Q4}$ ;  $SE_s = 0.12_{Q1}, 0.13_{Q2}, 0.13_{Q3}, 0.15_{Q4}$ ) than in the affirmation condition ( $M_s = 2.92_{Q1}, 2.74_{Q2}, 2.83_{Q3}, 2.85_{Q4}$ ;  $SE_s = 0.13_{Q1}, 0.13_{Q2}, 0.13_{Q3}, 0.16_{Q4}$ ). These linear trends were significantly different, as indicated by a Time  $\times$  Condition interaction for Latino American students,  $F(1, 146) = 5.30, p = .023$ . By comparison, for White students, there was no significant Time  $\times$  Condition interaction,  $F(1, 146) = 1.46, p = .23$ . Indeed, for White students, there was no downward linear trend in either the control condition ( $M_s = 3.68_{Q1}, 3.71_{Q2}, 3.57_{Q3}, 3.79_{Q4}$ ;  $SE_s = 0.09_{Q1}, 0.10_{Q2}, 0.10_{Q3}, 0.12_{Q4}$ ) or the affirmation condition ( $M_s = 3.66_{Q1}, 3.59_{Q2}, 3.46_{Q3}, 3.61_{Q4}$ ;  $SE_s = 0.10_{Q1}, 0.10_{Q2}, 0.10_{Q3}, 0.12_{Q4}$ ). Among those in the control condition, the trend seen with Latino American participants was significantly more negative (i.e., downward) than the trend seen with White participants,  $F(1, 146) = 9.78, p = .002$ , whereas in the affirmation condition, there was no difference in the linear trends between White participants and Latino American participants,  $F(1, 146) = 0.32, p = .57$  (see Figure 3). In summary, affirmation eliminated the downward trend in GPA among the Latino American students.

Within the repeated-measures ANCOVA, we also examined the overall between-subjects effect that tested whether there were overall effects across the quarters—cumulative GPA. Overall, Latino American students had a significantly lower GPA ( $M = 2.65, SE = 0.08$ ) than did White students ( $M = 3.63, SE = 0.06$ ),  $F(1, 146) = 88.93, p < .001, d = 1.16$ . There was no main effect of affirmation status,  $F(1, 146) = 1.62, p = .21$ . However, the main effect of ethnicity was qualified by a significant two-way

interaction between condition and ethnicity,  $F(1, 146) = 5.34, p = .022$ . Affirmed Latino American students ( $M = 2.84, SE = 0.12$ ) had a higher GPA than unaffirmed Latino American students ( $M = 2.46, SE = 0.11$ ),  $F(1, 146) = 5.05, p = .026, d = 0.45$ . By contrast affirmed White students ( $M = 3.58, SE = 0.09$ ) did not differ in GPA from unaffirmed White students ( $M = 3.69, SE = 0.09$ ),  $F(1, 146) = 0.74, p = .39, d = 0.13$ . As in Study 1, we subtracted the mean scores of Latino American students in each condition from the overall White students' mean to estimate the reduction in achievement gap in the two conditions. Doing so indicates that the affirmation reduced the achievement gap from 1.17 to 0.80 for covariate-adjusted means for a 32.0% reduction and from 1.16 to 0.83 for raw means, for a 28.4% reduction.

We conducted a final univariate ANCOVA on the estimated grades for the final quarter to examine how the students performed at the very end of the school year, the time period that was focused on the most difficult material and that represented the endpoint of the change in linear trend instigated by the affirmation. The Ethnicity  $\times$  Condition interaction was highly significant,  $F(1, 146) = 8.06, p = .005$ . The GPA of affirmed Latino American students was significantly higher ( $M = 2.85, SE = 0.16$ ) than the GPA of Latino American students in the control group ( $M = 2.27, SE = 0.15$ ),  $F(1, 146) = 7.49, p = .007, d = 0.56$ . The GPA of affirmed White students ( $M = 3.61, SE = 0.12$ ) was not different than the GPA of White students in the control condition ( $M = 3.79, SE = 0.11$ ),  $F(1, 146) = 1.19, p = .28, d = 0.17$ . These findings at the end of the year suggest that the effect of the intervention may have strengthened over time, perhaps as students faced greater adversity with more difficult material. These findings are also consistent with a recursive cycle (Cohen et al., 2009): If identity threat builds off itself, then a consequence is a widening gap over time, as concerns related to identity threat magnify, and the consequences grow more severe. These findings suggest that the affirmation intervention as well works through this cyclical process whereby a little early reduction in threat can have compounding consequences.

**Level of construal.** According to our theoretical framework, identity threat compels a focus on concrete cues and their significance for the presence of threat, and this manifests itself as a lower level of construal. We predicted that Latino American students, the identity threatened group, would adopt a relatively low

<sup>7</sup> With one exception participants had scores on at least one of the two covariates (when they had only one, that was used as the covariate). The one exception was assigned the mean value of the combined covariate for his or her ethnic group (zero, given that the covariate was mean-centered on zero within each ethnic group). In addition, to verify that random assignment was successful and that preintervention performance did not differ by condition, we conducted separate 2 (Condition)  $\times$  2 (Ethnicity) ANOVAs on pretest identification and preintervention state achievement scores, respectively. The ANOVAs on identification and test scores revealed only main effects of ethnicity, as White students were more identified than Latino American students ( $p = .002$ ) and scored higher on achievement tests ( $p < .001$ ). There were neither main effects nor interactions involving affirmation condition on either of these or on the combined covariate.

<sup>8</sup> Inclusion of the outlier for whom we had complete data changes the significance of this specific interaction,  $F(1, 147) = 3.27, p = .073$ , and the Latino American contrast,  $F(1, 147) = 2.72, p = .102$ . One-tailed tests, justifiable given that Study 2 constitutes a replication of Study 1, yield  $p$  values of .036 and .051, respectively.

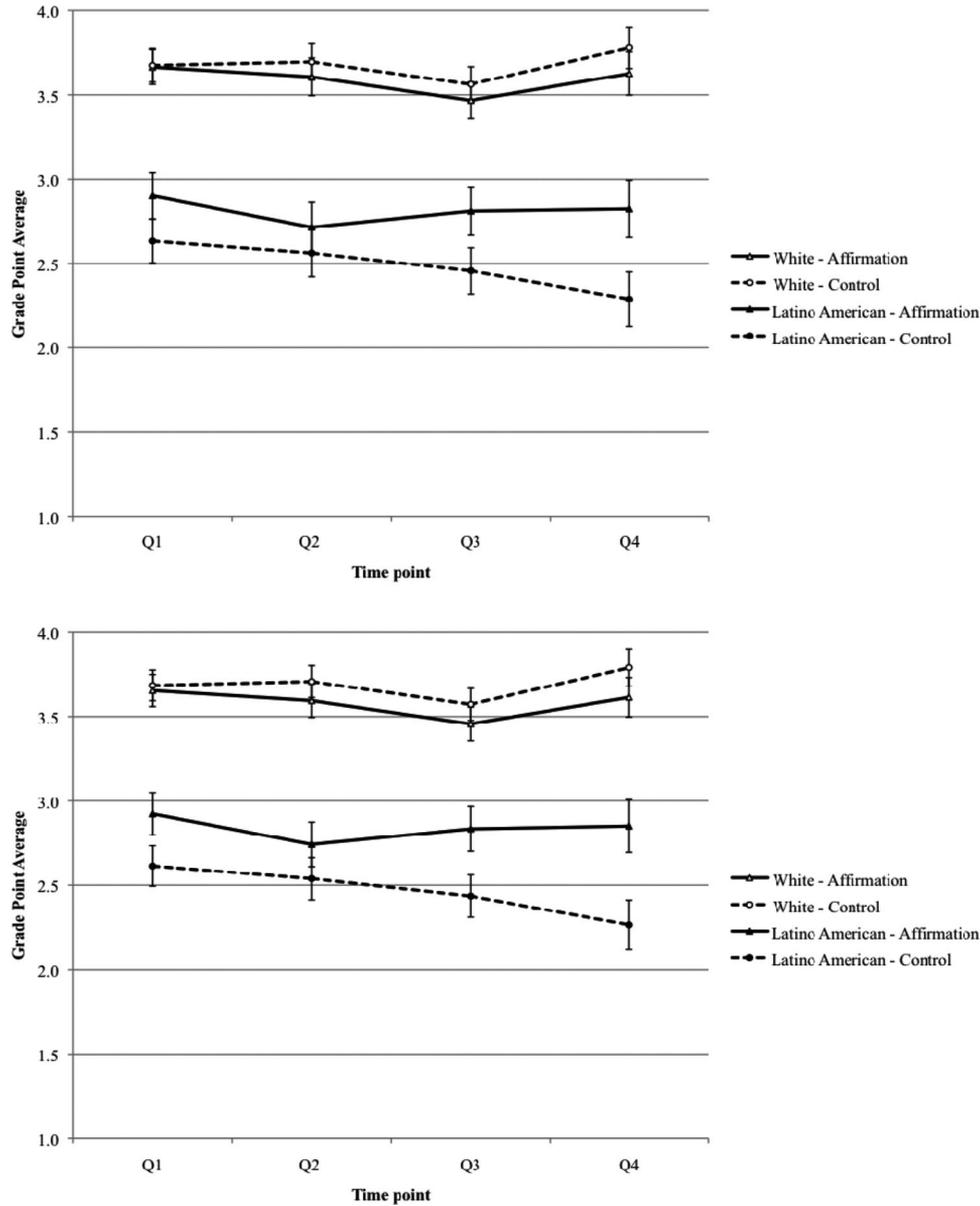


Figure 3. From Study 2, performance across school year as a function of ethnicity and condition, with both raw means and error terms (top) and means and error teams adjusted for baseline covariates and grade level (bottom). Error bars represent  $\pm 1$  standard error. The y-axis represents the grade point average metric, ranging from 0 (F) to 4.33 (A+). Q = quarter.

or concrete level of construal but that this tendency would be attenuated in the affirmation condition. The combined results of the two samples ( $N = 135$ ) were analyzed with ANCOVA, with specific sample (Sample 1 vs. Sample 2) controlled as a covariate. Results supported this hypothesis. The dependent variable was the proportion of total items for which the participant chose the higher construal choice. When we combine the results, we observed no main effect of ethnicity,  $F(1, 130) = 0.001, p = .98$ , and no main effect of condition,  $F(1, 130) = 1.79, p = .18$ . However, there was the predicted Ethnicity  $\times$  Condition interaction,  $F(1, 130) = 7.67, p = .006$  (see Figure 4). In addition, when each sample was

examined separately, the significant Ethnicity  $\times$  Condition interaction was observed in both the health class sample,  $F(1, 40) = 4.23, p = .046$ , and the end of the school year sample,  $F(1, 87) = 4.09, p = .046$ .

Examining specific contrasts within the combined sample, the affirmation increased the level of construal of the Latino American students, as those who were affirmed ( $M = 0.66, SE = 0.041$ ) had higher levels of construal than the unaffirmed ( $M = 0.51, SE = 0.041$ ),  $F(1, 130) = 6.62, p = .011, d = 0.66$ . By contrast, for White participants, there was no difference between those who were affirmed ( $M = 0.56, SE = 0.031$ ) and those who were

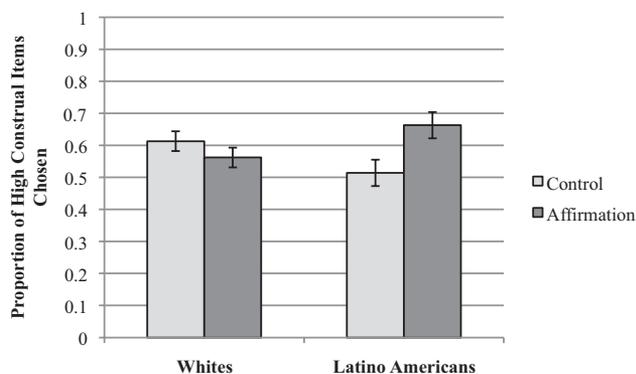


Figure 4. From Study 2, construal levels (proportion of high construal items chosen) as a function of ethnicity and condition for two combined samples, with adjusted means and error terms, controlling for sample. Error bars represent  $\pm 1$  standard error.

unaffirmed ( $M = 0.61$ ,  $SE = 0.031$ ),  $F(1, 130) = 1.38$ ,  $p = .24$ ,  $d = 0.22$ . In the control condition, Latino American students had marginally lower levels of construal than the White students,  $F(1, 130) = 3.76$ ,  $p = .055$ ,  $d = 0.44$ , a tendency that was eliminated, indeed reversed in the affirmation condition,  $F(1, 130) = 3.92$ ,  $p = .05$ ,  $d = 0.45$ . This pattern suggests that the experience of threat may have lowered the construal of Latino American students, consistent with the notion that identity threat leads to a more concrete encoding of experience. It is further suggested by the finding that affirmation—a threat reducing intervention—lifted Latino American students' level of construal.

**Decoupling.** While students who have a threatened social identity may have a relatively low level of construal, this does not imply that they do not abstract meaning from the cues they perceive. Rather, the meanings they abstract are expected to be focused more on the issue of threat vs. safety with regard to their ethnic group identity. Thus, we further expected that there should be a relatively tight coupling between the perception of adversity in school (“Today I feel stressed out”) and felt identity threat in the school (“I am worried that other people might judge me based on my race”). Likewise, there should be a relatively tight coupling between the felt racial threat and the perception that one “belongs” or “fits in” in school, perceived academic fit. Insofar as people focus on cues and their significance for their threat or safety, they should more readily see in adversity a sign that the stereotype is in play and evidence that they do not belong.

This theoretical framework leads to the decoupling hypothesis: Affirmation should attenuate the within-subject correlations among daily adversity, identity threat and academic fit for Latino American, but not for White students (see also Cook et al., 2012; Walton & Cohen, 2011, for a similar procedure). A key aspect of this process is that while the absolute level of adversity, identity threat, or academic fit, may be unaffected by affirmation status, the relationship between these variables should be (Sherman & Hartson, 2011). The data supported this prediction.

First, we examined whether absolute levels of adversity, identity threat, and academic fit (composed of belonging, efficacy, and school pride) were affected by ethnicity and affirmation status. We subjected the different composite scores to a 2 (Ethnicity: White

vs. Latino American)  $\times$  2 (Affirmation status: Affirmation vs. Control) multivariate analysis of variance (MANOVA). The MANOVA revealed two effects of interest. First, Latino American students perceived more identity threat ( $M = 2.27$ ,  $SE = 0.14$ ) than White students ( $M = 1.78$ ,  $SE = 0.10$ ),  $F(1, 96) = 8.45$ ,  $p = .005$ ,  $d = 0.59$ . Second, there was a trend for affirmation to lessen daily adversity, such that overall, affirmed participants perceived less daily adversity ( $M = 2.53$ ,  $SE = 0.13$ ) than control participants ( $M = 2.84$ ,  $SE = 0.13$ ),  $F(1, 96) = 2.83$ ,  $p = .096$ ,  $d = 0.36$ . However, neither of these effects was qualified by Ethnicity  $\times$  Condition interactions ( $ps > .11$ ). Thus, affirmation and ethnicity did not interact to affect the absolute levels of these psychological outcomes. What was influenced, as documented below, was the relationship among these psychological outcomes.

To measure how much each student's felt identity threat and academic fit were responsive to adversity, we created within-subject correlations for the daily composites (see Walton & Cohen, 2007, for general approach). As is appropriate, these within-subject correlations were first transformed to Z-scores before undertaking analyses on them. (When a within-person correlation was 1.0 or  $-1.0$ , we Winsorized the scores by assigning the person the next most extreme observation [e.g., a 1.0 was transformed to a 0.98], a necessary transformation because perfect correlations cannot be transformed to Z scores.) Means were computed by averaging the Z-scores, transforming the Z-score to a correlation coefficient, and then squaring that correlation coefficient, to yield the percentage of the variance in the outcome explained (e.g., the percentage of the variance in academic fit explained by level of identity threat).

Consistent with predictions, greater daily adversity related to higher identity threat among nonaffirmed Latino American participants but not among affirmed Latino Americans. For the correlation between daily school adversity and identity threat, there was no main effect of ethnicity,  $F(1, 96) = 0.56$ ,  $p = .46$ , and a marginal main effect of condition,  $F(1, 96) = 3.41$ ,  $p = .068$ , such that there was a stronger positive correlation between identity threat and adversity in the control condition ( $r = .15$ , 2.2%,  $SE = .07$ ) than in the affirmation condition ( $r = .06$ , 0.3%,  $SE = .07$ ). However, this was qualified by the significant interaction,  $F(1, 96) = 6.17$ ,  $p = .015$ , as depicted in Figure 5 (top).<sup>9</sup>

For Latino American participants, daily adversity correlated with identity threat in the control condition ( $r = .35$ , 12.3%,  $SE = .12$ ) but not in the affirmation condition ( $r = -.05$ , 0.2%,  $SE = .11$ ), a significant difference,  $F(1, 96) = 6.98$ ,  $p = .01$ ,  $d = 0.90$ . In other words, unaffirmed Latino American students appeared to perceive daily ups and downs in terms of their relevance to race-based threat, a tendency that was dispelled by affirmation. For White participants, there was no relationship between these vari-

<sup>9</sup> Analyses were robust when controlling for the health quarter in which the students completed the daily assessments (fall, winter, or spring). In addition recall that we restricted our sample to those who completed four to six diary entries because a within-subject correlation based on only two time points is highly unstable, with a possible correlation of only  $+1$  or  $-1$ . Nevertheless, the interaction patterns remain the same if we include the full sample. For the relationship between daily adversity and identity threat, the interaction is not significant, although it is in the same direction,  $F(1, 114) = 2.49$ ,  $p = .11$ ; for the relationship between identity threat and daily adversity, the interaction is significant and in the same direction,  $F(1, 114) = 4.63$ ,  $p = .03$ .

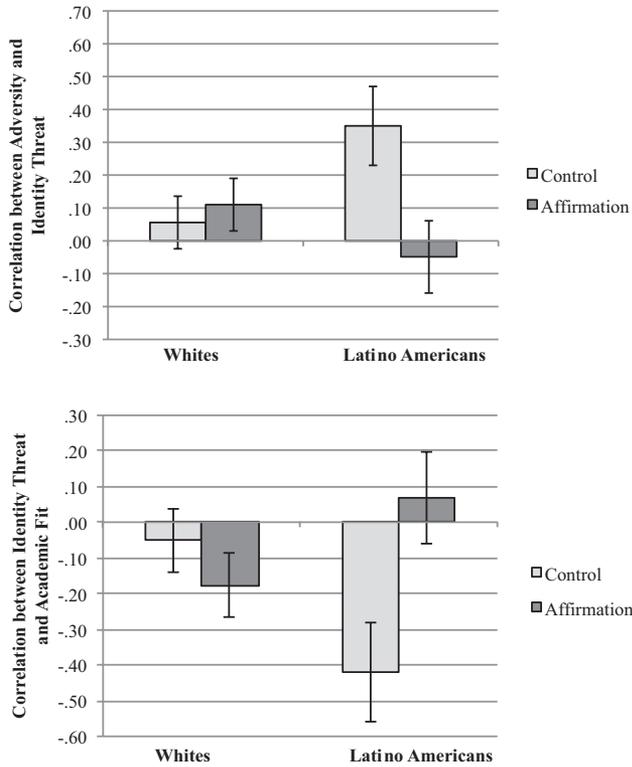


Figure 5. Average within-person correlations between daily levels of adversity and identity threat (top) and identity threat and academic fit (bottom) as a function of ethnicity and condition, with raw means and error terms. Error bars represent  $\pm 1$  standard error.

ables in either the control condition ( $r = .06$ , 0.3%,  $SE = .08$ ) or the affirmation condition ( $r = .11$ , 1.3%,  $SE = .08$ ),  $F(1, 96) = 0.31$ ,  $p = .58$ ,  $d = 0.13$ . Thus, for White participants, regardless of affirmation status, there was no link between their daily adversity and identity threat. Examining the other set of contrasts reveals that in the control condition, Latino American students associated daily adversity with identity threat to a greater extent than did White students,  $F(1, 96) = 4.95$ ,  $p = .028$ , a tendency that was eliminated by affirmation,  $F(1, 96) = 1.60$ ,  $p = .21$ . In short, affirmation enabled Latino American students to compartmentalize daily adversity as unrelated to identity threat.

In summary, the identity-threatened group, Latino Americans, appears relatively more likely to construe the day-to-day slings and arrows of academic experience through the lens of race. However, even in the control condition, the relationship between daily adversity and identity threat was not deterministic, as day-to-day adversity explained only 12% of the day-to-day fluctuation in identity threat. It seems instead that unaffirmed Latino Americans were simply more likely than were affirmed Latino Americans to see adversity as a sign that the stereotype was in play. Importantly, the perception of such identity threat, in turn, was associated with lower academic motivation.

We next examined the relationships between identity threat and the academic fit composite. There was neither a main effect of ethnicity,  $F(1, 96) = 0.42$ ,  $p = .52$ , nor a main effect of condition,  $F(1, 96) = 2.73$ ,  $p = .10$ . However, there was again a significant

interaction,  $F(1, 96) = 7.55$ ,  $p = .007$ , as depicted in Figure 5 (bottom). For Latino American participants, high identity threat correlated with low academic fit in the control condition ( $r = -.42$ , 17.5%,  $SE = .14$ ) but not in the affirmation condition ( $r = .07$ , 0.4%,  $SE = .13$ ),  $F(1, 96) = 7.20$ ,  $p = .009$ ,  $d = 0.91$ . For White participants, by contrast, there was no difference between the unaffirmed ( $r = -.05$ , 0.2%,  $SE = .09$ ) and the affirmed ( $r = -.18$ , 3.1%,  $SE = .09$ ),  $F(1, 96) = 0.91$ ,  $p = .34$ ,  $d = 0.23$ . For those not experiencing identity threat, identity threat was unrelated to academic fit.

Examining the other set of contrasts reveals that in the control condition, high perceived threat correlated with low academic fit to a greater extent for Latino American students than for White students,  $F(1, 96) = 5.46$ ,  $p = .022$ , whereas the affirmation led the Latino American and White students to have more comparable experience in which neither group globalized the implications of perceived threat,  $F(1, 96) = 2.33$ ,  $p = .13$ .

These intriguing correlational results, based on daily reports of students throughout the school year, suggest that affirmation enabled Latino American participants to insulate their sense of academic fit from day-to-day adversity. Although the directionality of the results is open to interpretation, taken together, the decoupling analyses provide a window into the daily experience of identity threat. For unaffirmed Latino American participants, daily adversity and identity threat were linked, as bad days and perceptions of identity threat went hand-in-hand. Additionally, daily feelings of identity threat also went hand-in-hand with lower academic fit among Latino Americans. By contrast, the affirmation severed the link between daily adversity and the perception of identity threat, and the link between perceived identity threat and academic fit. In short, affirmation enabled Latino Americans to construe adversity as more of an isolated event. They did not globalize its implications into identity threat. And identity threat, even when perceived, did not impinge on academic motivation.

**Relationships between psychological outcomes and grades.** We also examined whether either construal level or coupling (the within-person correlations between adversity and identity threat and between identity threat and academic motivation) mediated condition effects on grades among Latino Americans. We found no evidence for statistical mediation. One obstacle in conducting these analyses is that the mediators are based on fewer participants ( $N = 135$  have construal data,  $N = 100$  have decoupling data,  $N = 93$  have both) than is the grade outcome ( $N = 151$  for grades). Another obstacle is that the measures of the psychological outcomes did not precede the outcome variable, grades, as both psychological outcomes and grades were assessed throughout the year. Given these constraints, the best test for mediation focused on the final quarter GPA as the outcome variable, as this final performance period followed or was concurrent with the measurement of all mediators. 89.4% of participants completed the construal measures. For these participants, there was a significant Ethnicity  $\times$  Condition interaction on final quarter GPA,  $B = .17$ ,  $SE = .067$ ,  $t(130) = 2.53$ ,  $p = .013$ . There was also a significant Ethnicity  $\times$  Condition interaction on the construal measure,  $B = .05$ ,  $SE = .02$ ,  $t(130) = 2.49$ ,  $p = .014$ . When we entered construal as an additional predictor in the analysis of GPA, the Ethnicity  $\times$  Condition interaction remained largely unchanged,  $B = .14$ ,  $SE = .068$ ,  $t(129) = 2.10$ ,  $p = .038$ . The relationship between construal and grades was marginal,  $B = .53$ ,  $SE = .29$ ,  $t(129) = 1.82$ ,  $p =$

.071. In summary, higher construal marginally predicted better end-of-year grades, but construal did not mediate condition effects on grades, as adding construal as a predictor did not account for any significant portion of the Ethnicity  $\times$  Condition interaction on grades.

As only 66.2% completed the decoupling measure, a mediational analysis of decoupling was not possible because the decreased statistical power resulting from this smaller sample rendered the Ethnicity  $\times$  Condition effect on grades nonsignificant. We also examined whether construal mediated the Condition  $\times$  Ethnicity interaction on decoupling or vice versa. No evidence for either pathway was found. Nor were either of the mediators correlated with one another. In summary, there was no evidence that the psychological effects of the intervention directly mediated the performance effects. It may be that affirmation has discrete effects on distinct outcomes (see also Cohen et al., 2009). Alternatively, the mediational pathways may be indirect or heterogeneous, a likelihood in a complex real-world setting (Garcia & Cohen, 2012; Sherman, 2012). For instance, a broad construal may not directly mediate grades but instead may constitute an initial spark that leads different students in different ways to seize learning opportunities in their environment.

## Discussion

Study 2 found that the grades of Latino American participants were once again higher among students who completed the value affirmation activities as part of their classroom activities, relative to a control condition. The downward slope among Latino American students in the control condition was quite pronounced, but the affirmation eliminated this decline. As in Study 1, the intervention did not affect White students, suggesting that it helped reduce the stress associated with identity threat.

Study 2 also found that for Latino American students, the affirmation broadened their construal, relative to the control condition. These findings are consistent with the results obtained in recent affirmation research that self-affirmation can broaden individuals' perspectives (Schmeichel & Vohs, 2009; Wakslak & Trope, 2009). However, the present results are the first demonstration that the affirmation can lead to these effects among a group of threatened participants, and outside of the laboratory. The effect of affirmation on construal persisted throughout the academic year. Among White participants in the present sample, we did not see any significant effects of the affirmation on construal levels. Moreover, within the control condition, the Latino American students had lower levels of construal than the White students, suggesting that the affirmation tamped down a cognitive manifestation of vigilance that emerged for Latino American students during the potentially threatening transition to 7th grade. That is, it appeared to broaden their outlook so that they were more likely to see events in terms of their abstract rather than their concrete meaning. This finding is consistent with process models of stereotype threat suggesting that it leads people to be vigilant and monitor the immediate environment for cues that could help determine the threat's presence and intensity (Schmader et al., 2008; see also Cohen & Garcia, 2008; Murphy et al., 2007), leading to a focus on lower level details rather than the bigger picture. These results suggest that the quality of the story telling of Latino

American students differed as a function of identity threat in that it was more likely to focus on details than the bigger picture.

In addition, the Latino American students' experience of daily adversity seemed to heighten identity threat, and this in turn seemed to undermine their academic motivation. Of course, these relationships were correlational; the direction of causality remains unclear and probably operates bidirectionally, a notion consistent with the recursive processes that we think are at work. Together, these results paint a rich portrait of the psychology of identity threat and how affirmation works. Affirmation opens people up to a broader cognitive perspective, and it helps them to construct a less threatening narrative around adversity.

Finally, neither of the psychological variables (construal or decoupling) was predictive of grades, suggesting that the affirmation intervention may have exerted independent effects on grades and the psychological variables (see also Cohen et al., 2006). We see these psychological variables as important outcomes in and of themselves, as portraying "the story" of what happens to students experiencing identity threat and what it means to affirm one's self-integrity over the course of the year. They suggest a broad suite of independent effects of affirmation on academic performance, construal, and the perception of daily events. Moreover, they paint a parallel picture with the results of recent investigations of minority students, where social-psychological interventions like affirmation severed felt belonging from adversity in school (Cook et al., 2012; Walton & Cohen, 2007, 2011). Although the details of the decoupling varied, the essence of the finding is strikingly similar and cause for greater confidence in the assertion that affirmation interventions enable minority students to isolate the "threat in the air" stemming from potentially negatively viewed social identities, so that it does not impinge on their perceptions of belonging and academic fit.

## Combined Study 1 and Study 2 Analyses: Moderation of Affirmation Effect

An important question is whether any subgroup of Latino American students benefited from the affirmation intervention more than others. Addressing this question advances an understanding of those variables that increase vulnerability to identity threat and responsiveness to affirmation. Examining moderation is also relevant to application of the intervention as it could potentially be delivered more efficiently if educators could identify diagnostic markers associated with increased likelihood of benefit. On an exploratory basis, we examined two possible moderators informed by prior research.

First, we created an acculturation index to examine whether greater exposure to American culture and English language, versus Mexican culture and Spanish language, moderated the effect of the affirmation. There were several theoretical possibilities that motivated examination of this variable. On the one hand, Latino American students who are more culturally immersed in Latino American culture may be more concerned about being targeted by the stereotype and thus may suffer more from identity threat, as they might, for example, speak with accents and have more Latino American friends. This would, in principle, lead them to benefit more from affirmation. On the other hand, these students may be more collectivistic because they are less acculturated to American norms of individualism (see, e.g., Heine & Lehman, 2004, for

discussion of acculturation and American norms). Thus, they may not benefit from a self-affirmation because the motive for self-integrity may be confined to individualistic cultures rather than collectivistic ones (Heine & Lehman, 1997; Hoshino-Browne et al., 2005).

A second potential moderator was ethnic group identification—that is, the degree to which students saw their ethnic group as an important basis of self-evaluation. This moderator was chosen because there are two interesting theoretical possibilities as to how ethnic group identification could affect the experience and impact of identity threat. On the one hand, Latino Americans, a heterogeneous group ranging from recent immigrants to long-term residents, may experience greater identity threat insofar as they identify with their ethnic group. Consequently, ethnic group identification may predict the extent to which they experience stereotype threat, as has been shown with women and gender identity (Schmader, 2002). Accordingly, those high in ethnic group identification may suffer the most identity threat and thus be the most buffered by the affirmation. On the other hand, prior work has found that minority students who express greater identification with their ethnic group are buffered against the impact of negative stereotypes targeted at their group. This may occur because identification with one's group may be a source of affirmation that buffers people against identity threat. Strong bonds with one's group can provide a sense of social support and ingroup pride that could help to counter threatening stereotypes and buffer people against their impact (Branscombe, Schmitt, & Harvey, 1999; Cohen & Garcia, 2005; Wong, Eccles, & Sameroff, 2003). Consequently, it may be those who are less identified, and without this buffer, who most benefit from the affirmation (Cohen & Garcia, 2005; Derks, van Laar, & Ellemers, 2009; Sherman et al., 2007).

## Method

**Moderation measures.** The two studies contained slightly different measures. However each study contained three common acculturation measures and three common ethnic group identification measures and those form our composites described below (using all the available measures produces the same results). Participants with completely missing data were not included in the moderator analyses, resulting in reduced degrees of freedom; participants with partial but incomplete data were included in the moderator analyses using the available data. All moderator measures were collected prior to the affirmation intervention.

For the acculturation variable, the three-item composite ( $\alpha = .84$ ) focused on language (“What language is spoken most commonly in your home [1 = English, 2 = Spanish]?” “What was the first language you learned [1 = English, 2 = Spanish]?” “When you watch TV at home, how often do you watch TV shows that are in English?” [originally a 5-point scale recoded so that 1 = *always*, 1.25 = *almost always*; 1.50 = *about half the time*, 1.75 = *almost never*, 2 = *never*]; for acculturation scales focused on language, see Marín & Gamba, 1996). All measures were then recoded into a scale from 1 to 2 and were reversed so that higher numbers on the acculturation index indicated greater exposure to English language and American culture relative to Spanish language and Latino American culture.<sup>10</sup>

For ethnic group identification, there were three items ( $\alpha = .76$ ) assessed on 5-point scales with higher numbers indicating greater

identification (“How important is your racial/ethnic background to you?” “I feel the most comfortable with people from my own racial group?” “How often do you think about your race or ethnicity?”). Interestingly, stronger acculturation to America correlated positively with higher ethnic group identification for both White participants,  $r(195) = .34, p < .001$ , and Latino American participants,  $r(130) = .37, p < .001$ .

**Participants and analytic plan.** The combined sample consists of those who met the inclusion criteria for their respective studies. Among the focal ethnic groups, 164 participants were randomly assigned to the affirmation condition (97 White, 67 Latino American), and 171 were assigned to the no-affirmation control condition (102 White, 69 Latino American).

To examine each moderator, we conducted multiple regression analyses with cumulative GPA as the outcome variable. At the first step of the regression analysis, we entered the covariates (pretest academic performance, standardized within study), study sample (Study 1 vs. Study 2), and the two grade dummy variables. At the second step of the regression analysis, we entered the main effects of affirmation condition (coded 0 = control, 1 = affirmation), ethnicity (coded 0 = White, 1 = Latino American), and the mean centered moderators. At the third step, we entered the three two-way interactions (Ethnicity  $\times$  Condition, Moderator  $\times$  Condition, Moderator  $\times$  Ethnicity). And finally, at the fourth step, we entered the key three-way interaction (Moderator  $\times$  Ethnicity  $\times$  Condition).

**Acculturation.** We first examined whether acculturation moderated the affirmation effect. There was no main effect of acculturation,  $B = .18, SE = .13, t(321) = 1.39, p = .17$ ; the positive relationship indicates that acculturation with English language and American culture was associated with better grades. There were no two-way interactions involving this moderator (all  $ps > .21$ ). The only interaction that emerged was the Ethnicity  $\times$  Condition interaction,  $B = .55, SE = .17, t(318) = 3.19, p = .002$ , replicating the pattern found in the previous studies. Most important, there was no three-way interaction between acculturation, race, and condition,  $B = .04, SE = .59, t(317) = 0.07, p = .945$ . Thus acculturation did not moderate the effect of affirmation on Latino students' GPA.

**Ethnic group identification.** We next examined whether ethnic group identification moderated the affirmation effect. We conducted the multiple regression analysis as with acculturation, except that ethnic group identification and its interactions with student ethnicity and condition were tested. There was no significant main effect or two-way interaction involving ethnic group ID ( $ps > .23$ ). However, the two-way interaction in Step 3, Condition  $\times$  Ethnicity,  $B = .45, SE = .14, t(314) = 3.29, p = .001$ , was qualified by a significant three-way Ethnic Group ID  $\times$  Ethnicity  $\times$  Condition interaction at Step 4,  $B = -.25, SE = .12, t(313) = -2.09, p = .037$ .

<sup>10</sup> Acculturation encompasses many components, while the present measure focuses solely on language (for discussion of this issue, see Zambrana, & Carter-Pokras, 2010). However, the results remain the same when the acculturation measure is broadened to include supplemental items only assessed in Study 2 (“How long have you lived in the United States,” with the original five-item response option recoded to a 2-point scale; and “How long have your parents lived in the United States,” with the response option again recoded to a two-item scale).

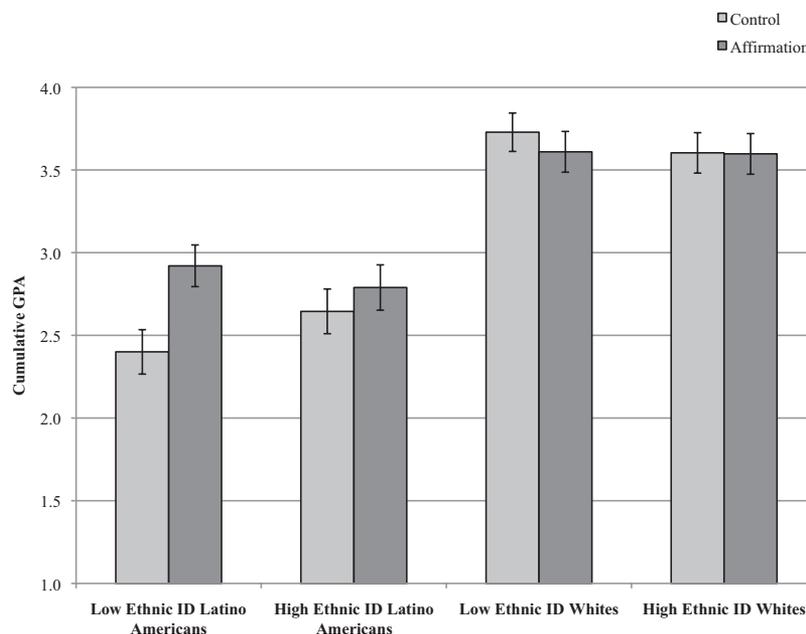


Figure 6. From Combined Study 1 and Study 2 samples. Cumulative grade point average (GPA) as a function of ethnic group identification (ID; bottom), ethnicity, and affirmation status. Error bars (representing  $\pm 1$  standard error) were calculated for the estimated means from the regression model. The y-axis represents the GPA metric, ranging from 0 (F) to 4.33 (A+).

The key finding to emerge from this three-way interaction is that Latino American students low in ethnic group identification benefited most from the affirmation. Whereas there was no significant interaction between condition and ethnic group ID among White students,  $B = .06$ ,  $SE = .08$ ,  $t(313) = 0.75$ ,  $p = .454$ , there was for Latino American students,  $B = -.19$ ,  $SE = .09$ ,  $t(313) = -2.12$ ,  $p = .035$ . To plot this interaction and test the simple slopes (see Figure 6), we examined the effect of condition among Latino Americans with low ( $-1$  SD) and high ( $+1$  SD) ethnic group ID ( $SD = 0.99$ ). At low levels of identification, there was a strong affirmation effect,  $B = .53$ ,  $SE = .13$ ,  $t(313) = 4.09$ ,  $p < .001$ . At high levels of identification, by contrast, the affirmation effect was not significant,  $B = .12$ ,  $SE = .07$ ,  $t(313) = 1.14$ ,  $p = .257$ .

Finally, we examined the buffering hypothesis, that is, whether in the absence of affirmation, Latino Americans with high ethnic group identification performed better than those with low group identification. Indeed, in the control condition, there was a trend such that higher ethnic identification for Latino Americans predicted better grades,  $B = .12$ ,  $SE = .07$ ,  $t(313) = 1.70$ ,  $p = .090$ . The latter effect is noteworthy because it suggests that high identification may be beneficial for Latino American students even controlling for their baseline levels of achievement.<sup>11</sup>

### General Discussion

In two field experiments, values affirmation activities helped to deflect negative academic trajectories and change narratives of ongoing experiencing among students experiencing identity threat. Latino American middle school students who completed brief in-class values affirmation exercises had improved grades over the school year in their core academic courses. Compared to Latino

American participants in the control condition, Latino American participants who completed the values affirmation activities—which were delivered by their teachers and which encouraged them to write about important values and times that they were important—had higher grades and did not experience a negative trajectory in their grades over the academic year. The affirmation effect on grades persisted through a third year (in Study 1) when many students advanced to high school. Thus, the intervention produced lasting change that, it seems, built on itself and carried over to a new academic environment. It seems that affirmation changed the narratives that the students were telling themselves about their academic experiences and that they carried these stories

<sup>11</sup> The combined sample was used to address another, more applied question. Given the importance of increasing minority participation in science, technology, engineering, and mathematics (STEM) fields, we wanted to know if the affirmation effects were evident in math and science. We conducted a 2 (Ethnicity: White vs. Latino American)  $\times$  2 (Affirmation status: Self-affirmation vs. Control) ANCOVA on cumulative math and science GPA for the combined sample. The analysis yielded a main effect of ethnicity,  $F(1, 327) = 261.63$ ,  $p < .001$ ,  $d = 1.13$ , indicating that Latino American students had a significantly lower GPA ( $M = 2.53$ ,  $SE = 0.05$ ) than did White students ( $M = 3.49$ ,  $SE = 0.04$ ). There was no main effect of affirmation status,  $F(1, 327) = 2.50$ ,  $p = .12$ . However, there was a significant two-way interaction between condition and ethnicity,  $F(1, 327) = 6.69$ ,  $p = .01$ . The GPA of affirmed Latino American students was significantly higher ( $M = 2.65$ ,  $SE = 0.07$ ) than the GPA of Latino American students in the control group ( $M = 2.41$ ,  $SE = 0.06$ ),  $F(1, 327) = 7.32$ ,  $p = .007$ ,  $d = 0.28$ . By contrast, the GPA of affirmed White students ( $M = 3.46$ ,  $SE = 0.05$ ) was not different than the GPA of White students in the control condition ( $M = 3.52$ ,  $SE = .05$ ),  $F(1, 327) = 0.62$ ,  $p = .43$ ,  $d = 0.07$ . These analyses suggest that the affirmation intervention bolstered STEM-relevant learning and performance.

with them beyond the immediate location where the intervention took place. In addition, supporting the reliability of the effects, similar performance effects obtained in two samples in two different regions of the country. However, both schools were ethnically integrated, as were the schools in earlier affirmation studies (Cohen et al., 2006, 2009); predominantly minority schools, lacking a racial division, may elicit less identity threat (Inzlicht & Ben-Zeev, 2000).

In addition, Study 1 featured a representative school sample as the intervention was disseminated throughout every grade and class, and there was extremely low attrition. Coupled with the double-blind experimental design, this helps rule out some of the threats to internal and external validity common in intervention research (Campbell & Stanley, 1963). Moreover, virtually all the Latino American students in Study 1 were receiving lunch assistance, whereas few of the White students were. The race gap in Study 1 is thus largely redundant with the “social class” gap—the growing divide in academic performance between the “haves” and “have-nots” (Reardon, 2011). This suggests that affirmation may constitute a partial but promising remedy for the growing achievement gaps arising from differences in socioeconomic status (Croizet & Millet, 2012). In addition, that affirmation improved science and math grades in middle school (see footnote 11) is important. Given that the choice to concentrate in science, technology, engineering, and math (STEM) is often made as early as high school, affirmation constitutes a potential strategy to expand the STEM pipeline in secondary education (Maltese & Tai, 2011; Miyake et al., 2010).

In Study 2, we examined in more detail the psychological consequences of identity threat and the intervention: Whereas unaffirmed Latino American students construed events at a lower level relative to White students and showed a significant degree of coupling between daily adversity, identity threat, and academic fit, affirmed Latino American students did not. They saw events from a broader perspective. Their feelings of being stereotyped in school did not rise or fall with adversity or the absence of it, and even when they felt stereotyped in school, their academic motivation in school did not suffer.

Below we address two questions raised by this research. First, how do these findings advance psychological understanding of self-affirmation theory (Sherman & Cohen, 2006; Sherman & Hartson, 2011; Steele, 1988) and identity threat? Second, what are the implications of these findings, as well as those of other social psychological interventions, for understanding and attenuating achievement gaps between students who experience identity threat in schools and those who do not?

## Understanding the Effects of Self-Affirmation

In a review of the self-affirmation literature, Sherman and Cohen (2006) proposed that:

When global perceptions of self-integrity are affirmed, otherwise threatening events or information lose their self-threatening capacity because the individual can view them within a broader, larger view of the self. People can thus focus not on the implications for self-integrity of a given threat or stressor, but on its informational value. When self-affirmed, individuals feel as though the task of proving their worth, both to themselves and to others, is “settled.” As a

consequence, they can focus on other salient demands in the situation beyond ego protection. (p. 189)

Study 2 unpacks these ideas about self-integrity and presents evidence to support these notions. The subjective construal of the environment was different for Latino American students vs. White students in the control condition and furthermore, different for Latino American students who were affirmed versus those who were not affirmed. Latino American participants who were given values affirmations in their class saw events and situations at a broader level of construal than Latino American students in the control condition, who saw things at a lower level of construal, relative to White students. This effect seems to be general, in that the measures of construal focused on general topics, and not just academics and were separated from the affirmation manipulation by weeks to months. These findings suggest that being under stereotype threat could lead to a narrowing of perspective for students experiencing identity threat, but providing opportunities for them to express their important values and thereby reminding them of their important self-resources can broaden this perspective.

The diary findings also suggest that the affirmed minority students were experiencing a broader perspective on threat in particular. When affirmed, and with their self-worth perhaps more secured, they did not experience daily adversity as indicative of identity threat, nor did identity-threatening experiences spread into and affect feelings of fit in the academic domain (see also, Crocker & Wolf, 2001). Rather, they were able to evaluate feelings of academic fit independent of the perceived threat in the environment.

Together, these findings suggest that the stories students tell themselves reflect a different psychological experience for those who experience identity threat and that affirmation can change this psychological experience and instigate lasting changes in how people construe threats over time. All students experience days of adversity, and some students experience events at school on some days that make them feel as though their groups do not belong. However, the affirmation seems to stop a negative recursive process (Cohen et al., 2009) whereby this adversity and identity threat spread to their feelings of academic fit. Again, these findings occurred several weeks to months after the self-affirmation manipulation, suggesting that affirmations led to ongoing changes in how individuals perceived their environments. It was not that affirmed Latino American students saw school as less stressful, or perceived less threat in the environment, but, rather, that these affirmed Latino American students did *not* connect these perceptions of threat to their feelings about their school, how much academic efficacy they had, and how much they felt that they belonged at school.

In summary, these results create a portrait of students at risk for being stereotyped as living in a world where experiences of identity threat and daily adversity quickly spread to their academic lives, which could, in turn, impair their performance. Moreover, the decoupling effects illustrate how brief social psychological interventions can exert longer-term effects: by changing the encoding of ongoing experience and the stories students tell to themselves (Wilson, 2011).

In the context of persistent threats, such as those that occur for minority students in academic settings, other repeated processes

may occur such that psychological threat harms performance, which increases threat and further harms performance (Cohen et al., 2009). Including an intervention at a critical point could forestall this recursive process (Cook et al., 2012; Garcia & Cohen, 2012). In terms of grades, both studies demonstrated steep downward slopes across the school year among nonaffirmed Latino American participants relative to their White peers. As the school year progresses and the classes move from review of prior year concepts to new and more challenging material, the potential for difficulty increases and the consequences of identity threat compound. Also, as knowledge builds on itself, it is easier to fall farther and farther behind, making it increasingly difficult to catch up. Importantly, the downward slide was consistently steeper for the identity threatened group in the control conditions of the two studies than for the nonthreatened group.

Laboratory experiments have shown how stereotype threat can undermine learning (Rydell, Rydell, & Boucher, 2010; Taylor & Walton, 2011) and how a values affirmation can prevent this effect, improving learning under otherwise threatening conditions (Miyake et al., 2010; Taylor & Walton, 2011). Our research provides further evidence in the form of grades for the capacity of values affirmations to interrupt negative recursive process whereby academic difficulty leads to stress and threat, which leads to greater academic difficulty. Although the interventions may be brief, their effects are potentially relived in many adverse situations. These effects can potentially compound if with every adverse situation, students facing identity threat are less likely to globalize it and to conclude that they do not belong.

Finally, these studies present the clearest evidence to date that affirmation manipulations can lead to theory-predicted, threat-reducing effects among people of Latino American and Hispanic heritage. Prior affirmation research with Latino American samples has yielded mixed results, and the efficacy of an affirmation procedure among Latino Americans was an open question. We predicted that because Latino Americans experience identity threat in academic environments, the affirmation intervention would be effective for them as it was for African Americans. The results supported this prediction and suggest that when threat is experienced, affirmations may be effective, regardless of culture (see also Hoshino-Browne et al., 2005). While there are many explanations for the robust effect of a *self*-affirmation among Latino Americans, a generally *collectivistic* group, we think one explanation particularly plausible. Rather than affirming the inner virtues of the self, affirmations may foster a narrative of adequacy and self-integrity by facilitating the expression of values that connect people to others (Crocker et al., 2008). Indeed, values affirmations tend to be more effective to the extent that people write about how their values make them closer to others (Shnabel et al., in press).

Our exploratory moderation analysis further suggested that a subgroup among Latino Americans were particularly likely to benefit: specifically, Latino American students with low levels of ethnic group identification. One explanation for this effect is that those who are more highly ethnic group identified can use their group identification as a source of affirmation that buffers them against identity threat (Cohen & Garcia, 2005). As a consequence, they need affirmation less. Suggestive evidence comes from the positive (albeit marginal) correlation between ethnic group identification and grades among the Latino Americans in the control

condition; this suggests that there may be some benefit to high group identification (Sherman et al., 2007), or perhaps a cost to distancing from one's group. Alternatively, perhaps Latino Americans who are less identified with their ethnic group are more concerned with negative evaluation from the White outgroup and thus more vulnerable (Sherman, Bunyan, et al., 2009). The moderation findings also illustrate an important intervention principle: treatment effects may be heterogeneous. The people most likely to benefit from affirmation, we suggest, will be those whose performance is being most consistently suppressed by psychological threat in a given setting. Who these people are will vary with context, the group being examined, and many other factors (see also Cook et al., 2012).

A question related to the effectiveness of the affirmation with Latino Americans is the relative ineffectiveness of the affirmation with Whites. One possibility is that European Americans are not experiencing a consistent threat in the middle school academic settings under investigation and that affirmation only buffers those experiencing threat. Threat moderates the effects of affirmation. Thus, the impact of affirmation will depend on contextual details affecting who is experiencing threat and who is not. For example, in laboratory studies, only those students for whom there was a negative stereotype about their math abilities (i.e., women) showed improved math performance when affirmed (Martens et al., 2006). A second possibility is that the stereotype lift (Walton & Cohen, 2003) that individuals experience as part of being in the majority in a mixed-ethnicity setting provides some group-affirmation (Derks et al., 2009; Sherman et al., 2007) that could attenuate the difference between the self-affirmation and the control condition, leading to the null effects. This would lead to the hypothesis that European Americans could benefit from an affirmation in a school where their group is in the minority (e.g., a school with predominantly Asian American and White students where the expectation is that Asian students outperform White students; Aronson et al., 1999), or that some European Americans whose social identity is threatened, such as those deemed "the poor kids" in a heterogeneous socioeconomic context may benefit from a self-affirmation procedure (Croizet & Claire, 1998). Moreover, it is possible that a subgroup of White students—such as those high in test anxiety or concerned with social-class-based stereotypes—could benefit from values affirmation, a possibility that awaits future research.

### Implications for Social Psychological Interventions

A recent review article of social psychological interventions in educational settings identified two common responses that readers have when hearing that seemingly small interventions produce large effects on grades and reduce achievement gaps (Yeager & Walton, 2011): (a) they appear "magical" and are thus dismissed as unworthy of further discussion; (b) they are so dramatic that they should be scaled up immediately. Yeager and Walton (2011) argued that both responses are unwarranted, and we concur with this assessment. We believe that the present results, by identifying some of the daily psychological variables that are affected by the affirmation, go some way to helping understand the effects of the social psychological intervention (see also, Wilson, 2011). It is not that the affirmed state persists through the academic year as a function of the essays students write. It is that the reminder and expression of important values in the school setting, and the extra

security of self-worth that comes with this reminder, prompts students to tell a different story to themselves about their experience and to take a broader view of events in their lives. When this is accomplished early on, the experience of threat is less likely to set the tone for the rest of their academic tenure.

In terms of scaling up the social psychological intervention, three points are noteworthy. First, it is important to bear in mind that the interventions were part of a normal school exercise in the students' classes, and not billed as a stress-reduction, or grade-boosting exercise. There is evidence that heightened awareness of the intent of the manipulation could diminish the beneficial impact and thus the relatively stealthy nature of the intervention may be one key to its efficacy (Sherman, Cohen, et al., 2009; for discussion, see Cohen et al., 2012; Yeager & Walton, 2011). At the same time, under certain situations—for example, when people choose to affirm themselves—affirmation can lead to beneficial effects even under conditions of awareness (Silverman, Logel, & Cohen, 2013). Given the importance of students' narrative experience in their academic progress, educators seeking to implement the intervention should carefully consider how to frame it to teachers and students.

Second, the timing of the intervention may be as important—if not more important—than the number of interventions (Garcia & Cohen, 2012). Transitions into middle school, high school, or college may be particularly effective times to administer interventions, as these are times when the performance standards students are expected to meet shift upward, students' sense of identity is in flux, and their existing social support circles are disrupted (Eccles et al., 1991; Simmons et al., 1991). Moreover, the stories that students tell themselves in these situations can have lasting impact as they are, in a sense, the opening passage of their narrative (Walton & Cohen, 2011; Wilson, 2011). Adolescence, when the intervention was administered, is a period where identity issues take on increasing importance (Altschul et al., 2008). Intervening early in these transitions can lead to relatively larger benefits because the intervention can interrupt recursive cycles that would otherwise ensnare students in a downward trajectory (Cohen et al., 2009; Cook et al., 2012; see also Moffitt et al., 2011).

Finally, although it is tempting to think of the affirmation as “the cause” of the improvement of grades, many different forces act on children in school (Garcia & Cohen, 2012; Woodhead, 1988). One must consider the entire psychological and social context of the classroom where students receive instruction and recognize that identity threat is one potential barrier among many possible forces, both positive and negative. Like many manipulations, the impact of affirmation will thus be context dependent. It will depend on whether psychological threat acts as a significant depressor of performance in a given context and on who experiences it there. In some contexts, like truly disadvantaged schools, threat may contribute little to performance relative to structural barriers. In other contexts, threat may contribute less to the performance of ethnic minorities than to that of other groups. For example, at historically Black colleges White students might experience the most consistent identity threat, especially in courses where they worry about being seen as racist (Steele, 2010), and on standardized tests of math and science, women might experience the most consistent identity threat (Miyake et al., 2010). Moreover, for affirmations to benefit performance, they also require other positive forces for learning to be present, forces whose impact may be unleashed with

the lifting of psychological threat (Cohen et al., 2006; Garcia & Cohen, 2012; Yeager & Walton, 2011). Rather than affirmation causing grade improvement in isolation, it enables the seeds that have already been planted by the teachers and schools to ripen into fruit (Lewin, 1951; Nussbaum, Logel, & Steele, 2012; Ross, Lepper, & Ward, 2010).

## Coda

In middle schools, Latino American students have lower levels of achievement compared to non-Latino White and Asian students (Kewal Ramani, Gilbertson, Fox, & Provasnik, 2007). It is interesting the explanations offered in a recent national survey of Latino Americans for this educational achievement gap:

When asked why Latino Americans on average do not do as well as other students in school, more respondents in the Pew Hispanic Center survey blame poor parenting and poor English skills than blame poor teachers. The explanation that Latino American students don't work as hard as other students is cited by the fewest survey respondents; fewer than four in 10 (38%) see that as a major reason for the achievement gap. (Lopez, 2009, p. 2)

Our research suggests an additional explanation (for which there is experimental evidence), one that probably is not as intuitive to many: that the situation of being a minority contending with identity threat could depress performance. Indeed, Walton and Spencer (2009) have compared students confronting identity threat to runners going into a headwind—their speed (or performance) is depressed by this external factor. Social psychological interventions that address identity threat can yield novel insight and recommendations for how to attenuate achievement gaps.

The mechanisms through which affirmations can benefit motivation, achievement, and openness to change more generally have received much research attention (e.g., Crocker et al., 2008; Critcher, Dunning, & Armor, 2010; Legault, Al-Khindi, & Inzlicht, 2012; Schmeichel & Vohs, 2009; Shnabel et al., in press; see Harris & Epton, 2010; Sherman, 2012; Sherman & Hartson, 2011, for reviews). Longitudinal field experiments can yield insight into these basic processes. We sought to use a wide-angle lens to examine a social situation over time. Looking through this lens revealed that affirmation does not so much change an outcome as it changes a process: the ongoing assimilation of experience.

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