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Effects of a Self-Affirmation Intervention on Grades in Middle School and First-Year College Students

Lisa Hayes
Leah Zinner
Justin Wise
John Carton
Oglethorpe University

Stereotype threat has been shown to negatively affect grades in school for underrepresented minority students. Interventions aimed at buffering stereotype threat have been developed with the goal of reducing racial achievement gaps. The self-affirmation intervention has been found to positively impact grades for potentially threatened students; however, recent results examining its efficacy have been mixed. This study tested the effect of the self-affirmation intervention on grades for two samples: (1) at-risk Latino middle school students; and (2) diverse first-year college students. Cognitive ability, perceived control, self-efficacy, belonging, and stress were also tested as potential moderators. We found no evidence of intervention effects and no moderation, suggesting that more research should be conducted before this intervention is implemented more broadly.

A large body of research supports the notion that social-psychological variables are important contributors to academic outcomes. One such variable is stereotype threat. More than 300 studies on stereotype threat have found that individuals experience threat when confronted with negative stereotypes about their group, and that this threat impairs performance on cognitive tasks. Stereotype threat also may be one contributor to the achievement gap that is present between underrepresented ethnic minority students and majority students, first-generation college students and continuing-generation college students, and men and women in science and math courses (see Walton & Spencer, 2009, for a meta-analytic review). Subsequently, interventions have been developed with the goal of protecting students against stereotype threat so that they can better succeed in an academic context.

Self-Affirmation Interventions

Self-affirmation interventions (also referred to as "values affirmation interventions") consist of a series of writing exercises that ask students to reflect on, and write about, their most important values, with the aim of helping students cope with identity threat (e.g., Cohen, Garcia, Apfel, & Master, 2006; Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009). The underlying theory is that giving students the chance to affirm their core personal values in a potentially threatening environment (i.e., school) will lead them to reestablish their perception of personal integrity and self-worth. This, in turn, reduces stress and anxiety within the academic environment, and leads to improved academic outcomes (Sherman & Cohen, 2006). Self-affirmation interventions have been tested with both middle school and college samples to examine their efficacy in improving grades in school, with mixed results.

The seminal research study in this area was conducted by Cohen and colleagues (2006). This study was completed with 133 low- and middle-income African American and Caucasian seventh grade students (61 Caucasian, 50 African American, 15 Hispanic or Latino, and 7 Asian American). Students were randomly assigned to either a self-affirmation intervention group or a control group. Administration took place during one 15–20 minute classroom session at the beginning of the school year, in which students in both conditions received a three-page packet to complete independently. The first page listed 12 personal values that had been validated by past research to be associated with self-worth (e.g., *creativity, independence, relationships with family and friends, athletic ability)*. Students in the self-affirmation condition were instructed to circle the two or three values most important to them, whereas students in the control condition were instructed to circle their two or three least important values. The second page of the packet instructed students to describe in a few sentences either why the selected values were important to them (self-affirmation condition) or why they might be important to someone else (control condition). The final page asked students to reexamine the values they had selected and list either the top two reasons why these values were important to them (self-affirmation condition) or the top two reasons why someone else might choose those values as important (control condition).

By the end of the fall semester, African American students in the self-affirmation intervention group had higher grades than African American students in the control group. The impact for African American students ranged from 0.21 to 0.34 GPA points

across courses, reducing the achievement gap between African American and Caucasian students in the intervention group by 40%. Moreover, for initially low-performing African American students, the self-affirmation intervention was associated with higher GPA in all core academic classes two years post-intervention (Cohen et al., 2009). As predicted by stereotype threat theory, the intervention benefited ethnic minority students but not Caucasian students. According to the authors, the reason for this is that Caucasian students were not subject to the negative recursive cycles that occur for underrepresented minority students, where psychological threat and poor performance feed off one another over time (Cohen et al., 2006). Another key finding was that the intervention did not increase GPA across middle school for African American students, but rather slowed its decline. In other words, the downward trend in grades that is commonly observed among middle school students (Eccles, Lord, & Midgley, 1991) was less steep among African American students in the self-affirmation intervention group.

Replications with Significant Effects

In one of the first replications of Cohen's study, Sherman et al. (2013) tested the self-affirmation intervention among Latino (n = 81) and Caucasian (n = 103) middle-school students. They found that the intervention partially closed the achievement gap for Latino students in terms of grades in school, and that these effects persisted over three years. Specifically, grades for Latino students in the control group decreased sharply over time, whereas grades for Latino students in the intervention group remained stable (but still lower than the grades of Caucasian students). These results suggest that the self-affirmation intervention may help change the trajectory of academic achievement for other groups of underrepresented minority students that are potentially vulnerable to stereotype threat.

Another replication was conducted by Borman and colleagues (2016). This study was a multiyear, districtwide randomized field trial that involved over 1,000 seventh grade students. Consistent with Cohen's (2006) seminal study, middle schoolers were randomly assigned to either the self-affirmation writing condition or a control writing condition, and teachers administered the writing exercises to students as part of normal classroom activities. Two exercises were administered each term (for a total of four exercises over the course of the school year). Results showed that the intervention had a statistically significant effect on seventh grade GPA for students who were potentially subject to stereotype threat based on their race/ethnicity (i.e., students who identified as African American, Latino, American Indian, or Pacific Islander). However, the effects were smaller than those reported in previous studies (e.g., Cohen et al., 2006; Cohen et al., 2009; Sherman et al., 2013), with an impact of 0.065 cumulative GPA points for potentially threatened students in the intervention group. This study also found a small effect of the self-affirmation intervention on standardized math scores for potentially threatened students. The authors note that the smaller effects found in this study were not surprising, given the difficulty in implementing and replicating an intervention with fidelity across so many classrooms and teachers. Despite these small effects, Borman (2017) has called for the values affirmation intervention to be implemented widely among minority students attending schools with large and apparent racial achievement gaps.

In a series of two studies, Goyer and colleagues (2017) examined the longitudinal effects of the self-affirmation intervention on at-risk middle school students. In the first

study, they followed Latino middle school students into high school and looked at outcomes related to college readiness. They found that Latino students who had participated in the intervention in middle school took more challenging courses in high school, and were more likely to enter a college readiness track rather than a remedial track two years after the intervention. Their second study looked at college enrollment data for African American students who had participated in the self-affirmation intervention during middle school. They found that African American students who had taken part in the intervention during middle school were more likely to enroll in college, and also more likely to enroll in a selective college or university, 7–9 years after the intervention (Goyer et al., 2017).

In addition to middle school students, some studies have shown the self-affirmation intervention to be effective among college students. For example, Miyake et al. (2010) tested the intervention among 283 men and 116 women in a college physics class. Similar to the Cohen et al. (2006) study, students in the intervention group wrote about values that were personally important to them during 15–20 minute classroom sessions. By the end of the 15–week course, the intervention was found to eliminate a substantial gender gap in physics grades, as well as decrease the gender gap in scores on a nationally normed physics test. Taken together, the gender gap in physics performance was reduced by 61% after the self-affirmation intervention.

Harackiewicz et al. (2014) extended research on the self-affirmation intervention described in Cohen et al. (2006) to first-generation college students in a large undergraduate biology course. Participants were 644 continuing-generation and 154 first-generation college students (7.6% were underrepresented ethnic minorities). Students completed either a self-affirmation writing exercise or a control writing exercise in their laboratory sections at two points during the semester. Results of this study showed that, for first-generation college students, the self-affirmation intervention significantly improved final course grades in Introduction to Biology. In addition, retention into the second course in the biology sequence was higher for students who participated in the self-affirmation intervention. The self-affirmation intervention also was associated with higher overall semester GPAs for first generation college students. The authors concluded that these two, 15–minute affirmation exercises narrowed the achievement gap in course grades between first-generation and continuing-generation students by 50%, and increased retention in the biology sequence by 20% (Harackiewicz et al., 2014).

Replications that Failed to Find Effects

Together, the studies reviewed above provide evidence that self-affirmation interventions can work in the short term, in terms of grades and classroom performance, as well as in the long-term, with regard to GPA several years later and increased retention rates. However, the magnitude of effects reported in the above studies varied considerably. More recently, there have been several implementations of this intervention that have failed to replicate the significant effects of earlier studies. One such replication was conducted by Dee (2015) with a sample of 2,500 seventh and eighth graders. This study included sizable populations of both African American and Latino students and closely replicated the methods of Cohen's (2006) formative study. Overall, participation in the self-affirmation intervention did not lead to higher course grades for the entire sample, or for the subsample of threatened ethnic minority (i.e., African American or Latino) students. Results of this

study highlight the fact that the underlying mechanisms of the self-affirmation intervention are not well understood, and further research needs to be done to understand what factors predict its success.

Hanselman, Rozek, Grigg, and Borman (2016) conducted a well-powered replication of the self-affirmation intervention with a goal of testing some of these potential mediators or moderators. Their study included 2,109 seventh grade students (37% African American or Hispanic) and replicated the procedures in Cohen's (2006) original study as closely as possible. The study took place over the course of the school year and included four administration points. Students were randomly assigned to either the self-affirmation intervention or the control group, and intervention effects were assessed for overall GPA in grades seven and eight, as well as effects on a standardized test (the Wisconsin Knowledge and Concepts Examination) in mathematics and reading. Data also were collected on aspects of self-affirmation implementation, including students' qualitative responses to the exercises and characteristics of teacher administration. Results showed that the self-affirmation intervention did not have a significant impact on grades in school or on test scores for their sample of middle school students. In addition, they did not find significant effects of the intervention for students of potentially threatened ethnic minority status, or evidence of differential effectiveness by prior academic performance.

The authors also examined variables that could serve as potential moderators. One question they sought to answer was whether differences in intervention content and delivery would be associated with the efficacy of the intervention. To test whether the content of the control condition could be associated with changes in grades, Hanselman and colleagues (2016) assigned part of their sample to write about their "least important values" as described in Cohen et al. (2006), and part of their sample to write about what they did over the summer. There were no differences found between these control conditions in grades or test scores.

Cohen and Sherman (2014) have argued that the self-affirmation intervention may be less effective when participants have contact with researchers and are aware that they are participating in a research study. Although this issue should be mitigated by the use of a control group, Hanselman and colleagues (2016) examined this assertion further by having researchers come into the classroom during the first week of school for a subsample of their participants. The researchers administered a survey that included items about specific characteristics (e.g., locus of control, sense of belonging) and explained that participants were taking part in a research study that semester on the thoughts and opinions of middle school students. In addition to researcher contact, post-intervention teacher surveys revealed that 42.2% of teachers told students during administration of the intervention that the activities were part of a research study. Results were that there were no differences in grades or test scores between the students who knew that they were participating in a research study and students who did not know that they were in a research study. Although Hanselman et al. (2016) emphasize that more research needs to be done on this topic, the findings suggest that knowledge of being in a research study is not a moderator of treatment effects for this intervention.

It has been proposed that the efficacy of social-psychological interventions may depend on the individual characteristics of participants and their environment. Hanselman and colleagues (2016) tested this assumption and did not find a statistically significant interaction between the treatment and the individual characteristics of Grade 6 GPA,

gender, English proficiency, or Special Education designation. They also tested whether the self-affirmation intervention would be more effective in "high threat" schools (i.e., schools with low minority populations and high prior achievement gaps) and found that the self-affirmation intervention did not work differently in high threat versus low threat schools (Hanselman et al., 2016).

Expanding upon this idea of "high threat" versus "low threat" schools is the question of whether the self-affirmation intervention is effective for minority students attending majority-minority schools. The number of African American and Latino students attending schools with large shares of Caucasian students has declined dramatically (Orfield et al., 2014), and these students increasingly attend schools that are composed entirely of other African American or Latino students. Bratter, Rowley, and Chukhray (2016) examined whether the self-affirmation intervention is effective in this context by conducting a randomized control trial of 886 students in three high schools (one predominately Latino, one predominately African American, and one with roughly equal shares of Latino, African American, and Caucasian students). The intervention was administered throughout the school year by English teachers during class time, and the outcome variables used were students' standardized test results in Reading and Algebra as well as English grades for the Spring semester. These researchers found no evidence that the self-affirmation intervention enhanced minority students' grades or test scores for students attending majority-minority schools.

Testing the Self-Affirmation Intervention in Two Novel Samples

In summary, several well-designed research studies have tested the impact of self-affirmation interventions with both middle school and college samples. However, results have been mixed, and questions remain about the effectiveness of such interventions in various academic settings and with diverse groups of students. Researchers have cautioned that, although brief social-psychological interventions can have lasting effects, their effects may be context-dependent (Yeager & Walton, 2011). As it currently stands, we do not have a clear understanding of the mediators and moderators of the significant effects of the self-affirmation intervention found in previous studies (e.g., Cohen et al., 2006; Cohen et al., 2009; Sherman et al., 2013). If self-affirmation interventions are potentially going to be implemented in schools, it is imperative to determine whether these effects are robust and replicable, and gain a better understanding of the factors that might be integral to the intervention's success.

The primary aim of the current study was to test the effectiveness of the self-affirmation intervention with two distinct groups of students. The first group was a sample of primarily Latino middle school students. The middle school sample used in this study represents an ideal group on which to test educational interventions given their exposure to several known risk factors related to educational achievement. Almost all students in this sample identified as a potentially threatened ethnic minority, and almost all students lived in households with incomes below the federal poverty level. The majority of the participants' families had immigrated to the United States, and most parents and many children spoke English as their second language. Finally, parental educational attainment was very low in this sample, with approximately half of the parents dropping out of school before the eighth grade. These risk factors, combined with potential stereotype threat, can

make it difficult for students to do well in school at a time when many middle schoolers are experiencing academic struggles (Eccles et al., 1991). If found to be effective, the self-affirmation intervention could be widely implemented in similar samples of at-risk middle school students.

The second group of students included in our study was a sample of diverse first-year college students. Our college sample offers a more direct replication of previous research studies using the self-affirmation intervention, as almost half of the sample identified as a potentially threatened ethnic minority (i.e., African American or Latino) and half identified as a non-threatened ethnic minority (i.e., Caucasian or Asian American). Students in this sample were all enrolled in their first year of college. The initial year of college is a significant developmental transition, and many young adults struggle to adapt to increasing academic demands, higher levels of independence, and unfamiliar living environments. As a result, first-year college students have been shown to experience greater levels of stress, anxiety, and depression compared to upperclassmen (Bayram & Bilgel, 2008). Underrepresented minority students are also at greater risk for dropping out of college, especially between the first and second year (Lee, Edwards, Menson, & Rawls, 2011; Warburton, Bugarin, & Nuñez, 2001). Consequently, if the self-affirmation intervention is found to be effective in this sample, it has the potential to not only increase grades for African American and Latino students, but also increase retention and graduation rates.

In addition to replicating the self-affirmation intervention with two different samples, we examined how the self-affirmation intervention would compare with a more traditional intervention for increasing grades in school. Study skills (i.e., knowledge of appropriate study strategies and methods and the ability to manage time and other resources to meet the demands of academic tasks) and study habits (i.e., the degree to which the student engages in appropriate study routines) have been found to rival standardized test scores and previous grades as strong predictors of academic achievement (Crede & Kuncel, 2008). Thus, for this study we developed a short intervention designed to teach basic cognitive skills to students. Few studies have directly compared the self-affirmation intervention to a similarly administered cognitive skills intervention, and those that did (e.g., Kizilcec et al., 2017; Walton et al., 2015) used different types of affirmation training.

Understanding the Mechanisms of the Self-Affirmation Intervention

A final aim of this study was to examine how more established predictors of grades in school would compare to the potential effects of the self-affirmation intervention. Moreover, we wanted to assess whether these variables would serve as mediators or moderators of the predicted impact of the self-affirmation intervention on grades in school. Thus, we measured several cognitive and socio-psychological variables that have been found to be related to grades in school for both middle school and college-age samples.

The first predictor we included was overall cognitive ability, which we assessed in our college sample with a general measure of IQ (Wonderlic, 2003). Because we had concerns about the large number of middle school students in our study who spoke English as a second language, we administered a measure of reading fluency, rather than general cognitive ability, to our middle school sample. Both cognitive ability and reading fluency have been found to be associated with academic achievement. They were included as moderators in order to test whether the self-affirmation intervention, which requires

reading comprehension and writing, would have stronger effects for students with higher abilities compared to students with lower abilities.

The second predictor we included was perceived academic control, which refers to a belief in one's capacity to influence or predict academic outcomes (Perry, Hladkyj, Pekrun, & Pelletier, 2001). Studies with children, adolescents, and young adults have shown that students with a higher sense of control exert more effort in class and have higher academic achievement compared to students with a lower sense of control (e.g., Findley & Cooper, 1983; Kalechstein & Nowicki, 1997; Perry et al., 2001; Perry, Hall, & Ruthig, 2005). A related construct is academic self-efficacy, which is the belief that one can master learning tasks and achieve in school. Self-efficacy significantly contributes to level of motivation (Bandura & Locke, 2003), and has been found to be related to grades in school as well as other measures of academic performance (e.g., Chemers, Hu, & Gable, 2001; Feldman & Kubota, 2015). We tested these variables as moderators, as students with a higher sense of academic control and higher academic self-efficacy may also be more receptive to the effects of the self-affirmation intervention.

One variable that has increasingly gained attention as an important contributor to academic achievement is sense of belonging at school. This construct assesses the extent to which students feel comfortable at school and feel accepted by peers and teachers. Studies that have measured sense of belonging at the general school level have found positive associations between belonging and school motivation, self-reported effort, expectations for success, and grades (e.g., Anderman & Freeman, 2004; Walton & Cohen, 2007; Zumbrunn et al., 2014). In a study that focused specifically on at-risk Mexican American high school students, sense of belonging at school was the only significant predictor of grade point average (GPA; Gonzalez & Padilla, 1997). One aim of the current study was to test whether sense of belonging would mediate or moderate the predicted effects of the self-affirmation intervention. This would be consistent with recent research that has shown that the significant effects of the self-affirmation intervention for negatively stereotyped groups in Cohen's (2006, 2009) original studies were partially explained by students' tendencies to write about why their important values made them feel connected to other people (Shnabel, Purdie-Vaughns, Cook, Garcia, & Cohen, 2013). In addition, Goyer et al.'s (2017) finding that African American students in the intervention condition were more likely to enroll in college compared to African American students in the control group was found to be partially mediated by sense of belonging.

The last variable we examined as a potential moderator was overall stress levels. Adolescents and young adults report high levels of chronic stressors, many of which are related to school (Williamson et al., 2003). This is of concern because high levels of stress have been linked to mental health and behavioral problems including depression, anxiety, and antisocial acts (Compas et al., 2001). College students report high levels of stress during their first year, and high levels of stress have been found to negatively impact academic performance (Akgun & Ciarrochi, 2003; American College Health Association, 2011). Therefore, we examined whether the self-affirmation intervention would work differently for students with varying levels of stress.

Summary

To summarize, the primary aim of this study was to test the efficacy of the self-

affirmation intervention in two groups of students: (1) a sample of at-risk Latino middle school students; and (2) a sample of diverse first-year college students. A secondary aim was to compare the effects of the self-affirmation intervention with a more traditional cognitive skills training that was designed to teach students more effective study habits. The final aim was to examine whether cognitive ability, perceived academic control, academic self-efficacy, sense of belonging in school, and stress levels would serve as mediators or moderators of the predicted effects of the self-affirmation intervention on grades in school.

Method

Participants

Middle School Students. Students in this sample were recruited from a charter middle school in a large Southeastern city. At the time of recruitment, 368 students were enrolled in grades 5–8. Consent was obtained from the parents of 137 students, and 116 students participated in both intervention sessions. Analyses that are reported here were conducted with this subset of participants.

In this sample, 53 students were in 5th grade, 24 were in 6th grade, 28 were in 7th grade, and 11 were in 8th grade. The average age was 11.50 years (*SD* = 1.23), and 60 students identified as female. Ninety percent of the children in this sample identified as Latino (*n* = 104). Six children identified as African American, three children identified as Asian American, and three children identified as another race/ethnicity. Ninety eight percent of the sample qualified for free or reduced lunch status. Most parents (83.5%) chose Spanish as their native language (4.6% chose English, 6.4% chose both English and Spanish, and 5.5% chose another language). For children, 44.9% chose Spanish as their native language, 29.9% chose English, 22.4% chose both English and Spanish, and 2.8% chose another language. Forty three percent of mothers and 47.3% of fathers reported achieving less than an eighth-grade education.

First-Year College Students. Students in this sample were recruited from a small liberal arts college in a large Southeastern city. All participants were first-year students who were participating in a mandatory seminar that met for one hour each week. Seminars were taught by different instructors, and there were 17 sections of the seminar with an average of 25 students in each section. A total of 273 students consented to participate in the study, and 187 eligible students participated in both intervention sessions. Analyses that are reported here were conducted with this subset of participants. In this sample, 116 participants were female, and the average age was 18.22 years (*SD* = 0.77 years).

It was important in this study to identify students who were potentially at risk of experiencing stereotype threat in an academic context. Previous research studies have shown substantial impacts of the self-affirmation intervention on GPA for African American (Cohen et al., 2006; Cohen et al., 2009) and Latino students (Sherman et al., 2013), but no effects for Caucasian students (Cohen et al., 2006; Cohen et al., 2009). Consistent with previous replication studies (e.g., Borman, Grigg, & Hanselman, 2016; Hanselman, Rozek, Grigg, & Borman, 2016), college students were divided into two groups: those potentially impacted by stereotype threat in an academic context (African American and Latino students) and those not subjected to stereotype threat (Caucasian and Asian American students). In the current study there were *n* = 85 students identifying as a potentially threatened ethnicity (*n* = 53 African American and *n* = 32 Latino) and *n* = 102 students identifying as a non-

threatened ethnicity (n = 89 Caucasian, n = 13 Asian American). International students (n = 8) were dropped from all analyses, as it was unclear how they would be impacted by stereotype threat.

Measures

Self-affirmation intervention and control. The self-affirmation intervention procedure was designed to replicate Cohen et al.'s (2006) procedure. Packets were four pages in length and included a cover sheet that was identical for each participant and included his or her name. Page two asked participants to read a list of 11 values and circle their two or three MOST important values (the control group was asked to circle their two or three LEAST important values). Page three instructed participants to look at the values they just chose and describe why the selected values were important to them (participants in the control group were asked to describe why the values they selected might be important to someone else). The last page asked participants to list the top reasons why the values they selected were important to them (or, for the control group, to someone else). The last series of questions asked participants to mark on a five-point scale (from strongly disagree to strongly agree) their agreement with the following four statements: (1) These values have influenced my life; (2) In general, I try to live up to these values; (3) These values are an important part of who I am; and (4) I care about these values.

Cognitive skills training. The cognitive skills training was designed to teach students basic study skills. The length and format of the cognitive skills training packet was similar to the self-affirmation intervention and control. The packet was four pages in length and included a cover sheet that was identical for each participant and included his or her name. Page two included descriptions of four study tips that students could apply to perform well in school. Tips included employing several small study sessions rather than one long cramming session before an exam, avoiding multitasking while studying, ways to test oneself without flash cards, and the importance of "overlearning" the material. Each tip was explained in two to four sentences. Page three asked students to explain in two to three sentences whether they had used any of the tips outlined on the previous page, and whether they had found them helpful. On the second half of the page, participants were asked which of the four tips they believed would be most helpful in high school (for the middle school sample) or later in college (for the first-year college student sample), and to explain why in two to three sentences. On the last page, participants were asked to think about the tips they just read about, and then rate how helpful they thought each tip would be to them in the future.

Grades. For middle school participants, official end-of-term grades for the spring semester were obtained for language arts, mathematics, science, and social studies. All grades were on a 100–point scale. For first-year college students, fall and spring semester GPAs (on a four-point scale) were obtained.

Reading Fluency. The measure of reading fluency used in the middle school sample was the Reading Fluency Subscale of the Woodcock-Johnson Tests of Achievement (WJ-III-Ach; Woodcock-Johnson, 2001). The Woodcock-Johnson is a standardized test designed to measure multiple aspects of academic achievement and cognitive development from age two through adulthood. The WJ-III-Ach was normed to represent the U.S.

population from ages 24 months to 90+ years in a sample of over 8,000 individuals from geographically diverse communities. The WJ-III-Ach subtests show strong reliabilities of .80 or higher (Woodcock-Johnson, 2001). The reading fluency subscale includes a list of 98 short statements that participants had to indicate by circling whether the answer was "yes" or "no." Example sentences are "You can eat an apple" and "A mouse can fly." Participants had three minutes to complete as many items as possible, and the total score was calculated by subtracting the number of items incorrect from the number correct. Higher scores indicate higher reading fluency.

Cognitive Ability. The measure of overall cognitive ability used in this study with the college sample was the Wonderlic Cognitive Ability Test (Wonderlic, 2003). This 50–item test is administered in 12 minutes and measures both crystallized and fluid intelligence, providing a reliable and quick measure of intelligence. This test includes vocabulary questions, math questions, and measures of visuo-spatial reasoning. The total number correct was used as the measure of cognitive ability, with higher scores indicating higher ability. The Wonderlic Test has been normed in college populations and correlates highly with the Kaufman Adult Intelligence Test (KAIT; Kaufman & Kaufman, 1993) Composite IQ, Crystallized IQ, and Fluid IQ scores (Bell, Matthews, Lassiter, & Leverett, 2002).

Academic Locus of Control. Academic locus of control was measured in both middle school students and college students with the Perceived Academic Control Scale (PACS; Perry, 1991). This scale includes eight items that ask participants to indicate their agreement on a five-point Likert scale. Example items are, "I have a great deal of control over my academic performance in my classes" and "The more effort I put into my courses, the better I do in them." This measure was scored by averaging the eight items, and higher scores indicate a higher sense of control.

Academic Self-Efficacy. Academic self-efficacy was measured in middle school students with the Academic Efficacy subscale of the Patterns of Adaptive Learning Scales (PALS; Midgley et al., 2000). This scale consists of five items and is intended for use in 5th to 9th grade students. Sample items include "I can do even the hardest work in this class if I try" and "I'm certain I can master the skills taught in class this year." Children respond on a five-point scale (from "Not at all true" to "Very true") and the total score is computed by averaging across the five items. This measure has been found to be reliable and valid in school-aged samples (Midgley et al., 2000).

Academic self-efficacy was measured in college students with the Self-Efficacy for Learning Form (SELF; Zimmerman & Kitsantas, 2007). This measure includes 19 items (e.g., "When you are trying to understand a new topic, can you associate new concepts with old ones sufficiently well to remember them?"). Participants are asked to choose a percentage from the scale given to indicate their answer. The scale ranges from 0% ("Definitely Cannot Do It") to 100% ("Definitely Can Do It"). Total scores are calculated by computing a mean of the 19 items, with higher scores indicating higher self-efficacy. This measure has been shown to be reliable and valid in measuring self-efficacy in college students (Zimmerman & Kitsantas, 2007).

Sense of Belonging in School. Sense of belonging in school was measured for both middle school students and college students with the Sense of Social and Academic Fit Scale (SSAF; Walton, Logel, Peach, Spencer, & Zanna, 2015). This measure includes

ten items (e.g., "I belong at my [college or university/school]," "I feel comfortable at my [college or university/school]." The items were changed to read "school" for the middle school students and "college or university" for the college students. Participants were asked to indicate on a seven-point scale (from "Strongly Disagree" to "Strongly Agree") their agreement with each item. The ten items were averaged to create a total sense of belonging score, and higher scores indicate higher sense of belonging at school.

Stress Levels. Stress levels were measured in middle school students with the Stress in Children Questionnaire (Osika, Friberg, & Wahrborg, 2007). This questionnaire was designed for use in 9– to 12–year-olds and has also been used in middle school samples. This measure has 21 items designed to measure symptoms of stress in children (e.g., "I feel calm and happy," "I get headaches"). Participants indicate how often they experience each symptom on a 1 ("Never") to 4 ("Very often") scale. This measure has shown satisfactory reliability and its ratings are associated with those generated by the Beck Youth Inventories of Emotional and Social Impairment (Osika, Friberg, & Wahrborg, 2007). The 21 items are averaged to create an overall stress level score, with higher scores indicating higher stress levels.

Stress levels were measured in college students with the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983), which measures the degree to which situations in one's life are appraised as stressful. The PSS includes 10 items (e.g., "In the last month, how often have you been upset because of something that happened unexpectedly?" and "In the last month, how often have you felt nervous and stressed?") and asks participants to indicate how often they felt a certain way on a scale from 0 ("Never") to 4 ("Very often"). The PSS shows adequate reliability and correlates with life-event scores, depressive and physical symptomatology, and social anxiety (Cohen, Kamarck, & Mermelstein, 1983). The items are averaged to create an overall stress level score, with higher scores indicating higher stress levels.

Procedure

The study took place during the spring semester for the middle school students, and during the fall semester for the college students. For each sample, students were randomly assigned into one of the three conditions (self-affirmation group, control affirmation group, or cognitive skills group). The current study attempted to replicate as many aspects of Cohen's self-affirmation studies (Cohen, Garcia, Apfel, & Master, 2006; Cohen et al., 2009) as possible, although some variations were necessary and are described below.

Several meetings were held with the middle school principal to gain her support and tailor the study to best fit the structure of the school. Recruitment letters for parents were sent home with students during the fall semester (letters were printed in English and in Spanish), and signed consent forms were returned to teachers and then collected by researchers. Although Cohen et al.'s (2006) procedure emphasizes that teachers should administer the intervention as if it is a normal classroom assignment, the principal of the middle school requested that research assistants help the teachers hand out the packets to participating students. Packets were created with each child's name on the cover sheet. Trained research assistants administered the packets in the classroom. Each research assistant read from a short script that asked students to read all instructions and fill out the packet honestly and completely. Research assistants were told that they could answer clarification questions (e.g., "What does this word mean?"), but should not guide the student to answer questions in

a certain way or offer suggestions of how the student should answer. Classroom teachers confirmed that all students in the study were able to read English at the level used in the writing of the packets, and research assistants were available to provide definitions of words if needed. The first administration of the study occurred during the second week of the spring semester, and the second administration occurred during week nine. Each session took approximately 20 minutes to complete. At the end of the semester (week 15), research assistants came back into the classroom and administered the timed reading fluency test as well as the questionnaires assessing perceived academic control, academic self-efficacy, sense of belonging in school, and overall stress levels. For each student who participated in the study, a small amount of money was given to the school to help fund an end-of-year class trip.

For the college students, the administration of the study occurred during regular meetings of a one-credit first-year seminar that all students were required to complete. There were 17 sections of the seminar that students were enrolled in taught by different instructors, but with similar assignments. The purpose of the seminar was to help students transition to college-level academic culture and included training in how to use college resources. Consent was obtained from students who agreed to have some of their class assignments analyzed for research purposes. No incentives were given for students to participate. Instructors were not aware of the hypotheses of the study or of which students were in the intervention group. The first administration of the study happened during the third week of the semester, and the second session happened during the eighth week. Before each session, instructors were given packets with consented students' names on the cover sheets. Students who did not consent to participate were given packets to complete as well, but their data was thrown out and not analyzed. Instructors told the students that the packets were an assignment for the course. Each session took approximately 15 minutes to complete. At the end of the semester (week 15), students were told to attend an evening research session to fulfill part of their requirements in the course. During this session, trained research assistants administered the timed Wonderlic test as well as the questionnaires assessing perceived academic control, academic self-efficacy, sense of belonging in school, and overall stress levels. This session took approximately 30 minutes for students to complete.

Results

Descriptive statistics for all variables assessed in the middle school sample and first-year college student sample are included in Table 1.

Effects of Self-Affirmation Intervention in Middle School Sample

An overall semester grade variable was calculated by finding the mean of the four grades obtained (language arts, mathematics, science, and social studies). To investigate whether there were differences in grades between the three conditions (self-affirmation intervention group, control affirmation group, and cognitive skills group), a one-way ANOVA was conducted with average spring grades as the dependent variable. Only data from students who participated in both intervention sessions were included in the analyses. Because 94% of the sample identified as a potentially threatened ethnicity (i.e., Latino or African American), ethnicity was not included as an independent variable in the analyses.

Table 1. *Means and Standard Deviations of Study Variables*

	Mean	Standard Deviation
Middle School Sample		
Overall Grades	84.78	6.16
Reading Fluency Test	51.43	16.24
Perceived Academic Control	3.61	0.52
Academic Self-Efficacy	3.97	0.80
Sense of Belonging in School	5.15	0.88
Stress Levels	2.10	0.40
First-Year College Sample		
Fall GPA	2.93	0.80
Spring GPA	2.88	0.89
Wonderlic Test	23.73	4.95
Perceived Academic Control	4.17	0.52
Academic Self-Efficacy	70.34	11.53
Sense of Belonging in School	5.18	0.83
Stress Levels	1.89	0.67

Results of the ANOVA indicate that there were no differences in grades between students who participated in the self-affirmation intervention (M = 84.21, SD = 4.97), students who were in the control affirmation group (M = 85.77, SD = 5.45), and students who were in the cognitive skills training group (M = 84.41, SD = 7.85), $F(2, 113) = 0.79$, $p = .49$, $p\eta^2 = .01$. Because nearly half of the sample reported English as their second language, these analyses were also conducted with reading fluency scores entered as a control variable. The pattern of results did not differ after controlling for reading fluency. The pattern of results also did not differ when examining language arts, mathematics, science, and social studies grades separately, or when examining Latino and African American students separately.

Effects of Self-Affirmation Intervention in First-Year College Student Sample

A primary goal of this study was to test if the self-affirmation intervention was associated with grades across the first year of college for underrepresented minority students. In order to test this, a two (threatened ethnicity status: yes, no) by two (time: fall, spring) by three (condition: self-affirmation group, control affirmation group, or cognitive skills group) mixed-design ANOVA was conducted. There was a significant main effect of threatened ethnicity status, $F(1, 167) = 7.44$, $p = .007$, $p\eta^2 = .04$, as the average GPA for students of potentially threatened ethnic minority status across the first year of college was significantly lower (M = 2.75, SE = 0.08) than the average GPA of non-threatened students (M = 3.06, SE = 0.08). There was no main effect of time, $F(1, 167) = 2.41$, $p = .12$, $p\eta^2 = .01$, as fall GPAs (M = 2.96, SD = 0.77) were not significantly different than spring GPAs (M = 2.88, SD = 0.89) across the entire sample. There was no main effect of condition, $F(2, 167) = 0.18$, $p = .84$, $p\eta^2 = .002$, as overall GPAs were similar for students in the self-affirmation group (M = 2.86, SE = 0.10), the control affirmation group, (M = 2.93, SE = 0.10), and the cognitive skills group (M = 2.93, SE = 0.10). The interactions also were not significant, indicating that the self-affirmation intervention did not work differently for students of potentially threatened ethnicities versus non-threatened ethnicities.

Testing Potential Moderators

In addition to testing the potential effects of the self-affirmation intervention, this study included a set of variables that have been linked with academic achievement in both middle school and college samples. These variables were cognitive ability (college sample), reading fluency (middle school sample), perceived academic control, self-efficacy, sense

of belonging in school, and overall stress levels. Correlations were first calculated between each variable and grades in school. Correlations for the middle school sample are displayed in Table 2. As expected, each variable was significantly correlated with average grades in school. Specifically, students with higher scores on reading fluency, perceived academic control, academic self-efficacy, and sense of belonging in school had higher grades in school. Students with lower stress scores also had higher grades in school. The strongest correlation was between sense of belonging and grades in school. A linear regression was calculated to see which of these variables was the strongest predictor of grades. The results of this analysis show that sense of belonging in school, $\beta = .31$, $SE = 0.95$, $t(92) = 2.29$, $p = .02$, and reading fluency, $\beta = .24$, $SE = 0.04$, $t(92) = 2.55$, $p = .01$, were the strongest predictors of grades in school for our middle school sample. Perceived academic control, academic self-efficacy, and stress levels were not significant predictors in the model (See Table 3). Together, reading fluency, perceived academic control, academic self-efficacy, sense of belonging in school, and stress levels accounted for 28% of the variance in grades.

Correlations for the first-year college student sample are displayed in Table 4. With the exception of Wonderlic scores not correlating with Fall GPA, all other variables were significantly correlated with both Fall and Spring GPA. As expected, students with higher scores on measures of cognitive ability, perceived academic control, self-efficacy, and sense of belonging in school had higher GPAs. Students with lower overall stress levels also had higher GPAs. For these college students, the variables that were

Table 2. *Pearson Correlations Between the Measures of Reading Fluency, Perceived Academic Control, Academic Self-Efficacy, Sense of Belonging in School, Stress Levels, and Average Grades in Middle School Sample*

	1.	2.	3.	4.	5.	6.
1. Reading Fluency	—					
2. Academic Control	.16	—				
3. Self-Efficacy	.18	.46***	—			
4. Belonging	.33**	.53***	.60***	—		
5. Stress Levels	-.15	-.33**	-.37***	-.57***	—	
6. Average Grades	.36***	.35***	.29**	.46***	-.26*	—

Note. *$p < .05$, ** $p < .01$, *** $p < .001$

Table 3. *Regression Analysis Predicting Average Grades with Reading Fluency, Perceived Academic Control, Academic Self-Efficacy, Belonging in School, and Stress Levels in Middle School Sample*

Predictor	Standardized Beta	*t* value	Standard Error	*p* value
Reading Fluency	.24	2.55	.04	.01
Academic Control	.15	1.44	1.26	.15
Self-Efficacy	-.01	-.08	.94	.01
Belonging	.31	2.29	.95	.02
Stress Levels	.001	.013	1.67	.99

Note. $n = 99$

Table 4. *Pearson Correlations Between the Measures of Cognitive Ability, Perceived Academic Control, Academic Self-Efficacy, Sense of Belonging in School, Stress Levels, and GPA in First-Year College Students*

	1.	2.	3.	4.	5.	6.	7.
1. Cognitive Ability	—						
2. Academic Control	.17	—					
3. Self-Efficacy	.11	.59***	—				
4. Belonging	.13	.55***	.50***	—			
5. Stress Levels	.03	-.20*	-.34***	-.16	—		
6. Fall GPA	.05	.37***	.37***	.24**	-.30***	—	
7. Spring GPA	.22*	.27**	.26**	.20*	-.21*	.63***	—

Note. **p < .05, ** p < .01, ***p < .001*

Table 5. *Regression Analysis Predicting Fall GPA with Cognitive Ability, Perceived Academic Control, Academic Self-Efficacy, Belonging in School, and Stress Levels in First-Year College Students*

Predictor	Standardized Beta	*t* value	Standard Error	*p* value
Cognitive Ability	.04	.48	.01	.63
Academic Control	.22	1.92	.15	.06
Self-Efficacy	.31	2.63	.01	.01
Belonging	-.08	-.74	.09	.46
Stress Levels	-.12	-1.32	.09	.19

Note. *n = 114*

Table 6. *Regression Analysis Predicting Spring GPA with Cognitive Ability, Perceived Academic Control, Academic Self-Efficacy, Belonging in School, and Stress Levels in First-Year College Students*

Predictor	Standardized Beta	*t* value	Standard Error	*p* value
Cognitive Ability	.15	1.65	.02	.10
Self-Efficacy	.27	2.24	.01	.03
Belonging	-.01	.12	-.09	.93
Stress Levels	-.05	.13	-.44	.66

Note. *n = 114*

the most strongly correlated with GPA were perceived academic control and academic self-efficacy. Linear regression analyses were conducted on Fall and Spring GPAs to see which of these variables was the strongest predictor of grades in school for first-year college students. The results of the analysis for Fall GPA were that self-efficacy was the only significant predictor in the model, $\beta = .31$, $SE = 0.007$, $t(108) = 2.63$, $p = .01$. All other predictors were not significant (see Table 5). Together, cognitive ability, perceived academic control, academic self-efficacy, sense of belonging in school, and stress levels accounted for 25% of the variance in grades. For Spring GPA, when all five predictors were included in the regression analysis, none of the predictors were significant. This was likely because of the large correlation between self-efficacy and perceived academic control ($r = .59$, $p < .001$). When perceived academic control was removed from the model, self-efficacy was the only significant predictor of Spring GPA, $\beta = .27$, $SE = 0.01$, $t(108) = 2.24$, $p = .03$. All other predictors were not significant (see Table 6). The percent of variance explained by the model only decreased by 1% after removing perceived academic control ($R^2 = .13$ with perceived control and $R^2 = .12$ without perceived control).

Although the primary analyses indicate that the self-affirmation intervention was not associated with higher grades (or less of a decline in grades over time) for either underrepresented ethnic minority students specifically or for the entire sample of middle school students or first-year college students, it was still possible that one of our additional variables would serve as a moderator. For example, perhaps the self-affirmation intervention would only be effective for ethnic minority students who were also high in self-efficacy or high in sense of belonging. Thus, moderation analyses were conducted separately with cognitive ability/reading fluency, perceived academic control, academic self-efficacy, sense of belonging in school, and overall stress levels. No moderation effects were found for either the middle school sample or the college sample.

Discussion

The primary goal of this study was to test the potential impact of the self-affirmation

intervention on grades in school for two samples of students—a group of at-risk middle school children who primarily identified as Latino and a group of ethnically diverse first-year college students. We did not find any differences in end-of-semester grades for middle school or college students who participated in the self-affirmation intervention, students in the control affirmation group, or students in the cognitive skills intervention group. The failure to replicate previous research findings (e.g., Cohen et al., 2006; Cohen et al., 2009; Sherman et al., 2013) could be due to several factors, which are discussed below.

The first potential explanation is that students in this study were completing the self-affirmation training differently than students in previous studies that found significant results. In order to test this, we conducted a content analysis on the writing packets to confirm that students were completing the exercises in a thoughtful way. Each packet was coded for number of sections completed, number of sentences written in the narrative portion of the packet, and which values were chosen. These analyses revealed that all students included in this report completed all sections of their packets. In the intervention group, middle school students wrote an average of five sentences in the narrative portion, whereas first year college students wrote an average of four sentences. The two most commonly chosen values for middle school students in the intervention group were "Relationships with Friends and Family" and "Creativity," and the two most commonly chosen values for first-year college students in the intervention group were "Relationships with Friends and Family" and "Membership in a Social Group."

It has been suggested that the topics students write about in the intervention may help explain why the intervention is effective for negatively stereotyped students (Shnabel et al., 2013). Specifically, an analysis of Cohen et al.'s (2006, 2009) original data showed that writing about interpersonal connections mediated the positive effects of the self-affirmation intervention for African American students (Shnabel et al., 2013). For the current study, all essays were coded using Shnabel et al.'s (2013) criteria for whether they included themes of interdependence. Results showed that students in the intervention group were more likely to write about belonging compared to students in the control group, and that more than half of all students in the intervention groups wrote about belonging. Thus, it does not appear as though completion rates or differences in the content of the narratives explain why we failed to replicate significant effects of the intervention.

Another possibility is that the intervention was not intensive enough to expect any meaningful impact on semester grades. Students assigned to the intervention were exposed to two, 20–minute training sessions during which they reflected on their core personal values through writing. The self-affirmation intervention is theorized to work by providing a psychological buffer against detrimental stereotype threats in school. Long-term effects of the intervention result from inhibiting the recursive cycle of stereotype threat and poor performance in school, so that early buffering can lead to substantial benefits over time (Cohen & Garcia, 2008; Cohen et al., 2009; Taylor & Walton, 2011). It is possible that simply writing about important personal values for such a brief length of time did not translate into restoring students' sense of worth in the face of much stronger academic identity threats. However, it should be noted that previous implementations of this intervention had similar exposure times and found significant effects of the intervention on grades. For example, Cohen et al.'s (2006) original study included only one 20–minute implementation of the intervention and reported large effects on grades for African American students.

It is also possible that we did not find effects of the intervention on grades in our middle school sample because we did not have access to longitudinal data on participants'

grades. As discussed in Cohen et al. (2006), the self-affirmation intervention has worked in the past by slowing the decline in GPA that would otherwise have occurred. Thus, following up our middle school sample over time could have revealed a long-term effect of the intervention. It should be noted, however, that our study included both fall and spring GPA for our college sample, and the intervention did not slow the decline in grades for the entire intervention group or for students of potentially threatened ethnic status. It should also be noted that earlier studies (e.g., Cohen et al., 2006) found an immediate effect of the intervention.

Related to this lack of longitudinal data, our analyses did not adjust for prior academic achievement of students (e.g., grades from prior years). In theory, the self-affirmation intervention exercises should be effective regardless of student ability, if participants are able to understand the instructions and complete the tasks thoughtfully (Cohen et al., 2006). Also, although we did not have access to prior grades, we did include cognitive ability for the college sample and reading fluency for the middle school sample in our tests of moderation, with no effects. However, it is possible that controlling for prior grades in school could reveal significant effects of the intervention that were not seen in this study.

It could also be argued that the current study's null findings in the middle school sample did not replicate previous significant results because we had research assistants administer the packets in the classroom, rather than teachers. Cohen and Sherman (2014) have argued that the self-affirmation intervention is most beneficial when it is presented as a normal classroom activity, and when students are not aware that the activity is part of a research study. However, there are no clear research findings supporting the idea that knowledge of participating in a research study serves as a moderator of the intervention's effects. For example, in the Hanselman et al. (2016) study, some of the middle schoolers were informed that they were participating in a research study. They found that there were no significant differences in grades between the students participating in the intervention who knew that they were in a research study and those who did not. Furthermore, on a practical note, if the self-affirmation intervention is to eventually be widely implemented in schools, then it will be necessary to work within the contexts and individual needs of those schools. In our case, the middle school principal requested that we administer the intervention ourselves in order to put less of a burden on teachers. Finally, it should be noted that when working with multiple classrooms of students, standardization of implementation is always a concern. By having trained research assistants using scripts to implement the intervention, we were able to achieve high levels of standardization (potentially at the expense of the intervention being perceived by students as a less authentic classroom experience).

The lack of effects in the middle school sample could also be partially explained by the timing of the intervention, which took place during the spring semester of the school year. Cohen and others (Cohen et al., 2009; Cook, Purdie-Vaughns, Garcia, & Cohen, 2012) have argued that the self-affirmation intervention is most effective if implemented before environmental threats, such as a decrease in school performance or poor end-of-semester-grades, can occur. Thus, it is possible that we would have seen effects of the self-affirmation intervention if we had implemented it during the fall semester, before students had received any grades or potentially negative feedback from their teachers. Timing, of course, is not a potential explanation for the null results in our college sample, as that study was conducted during the fall semester of students' first year in college.

Of the potential explanations for our null results, one explanation that seems

likely is that the two groups of students used in this study may not have been experiencing high levels of identity threat. According to stereotype threat theory, the self-affirmation intervention is likely to produce the strongest benefits in environments where identity threats are pervasive and overwhelming (Steele, 1997). In the current study, the school environments of our participants may have already served to buffer any potential threats to identity. For example, the middle school students in our study attended a school where the majority of students identified as an ethnic minority, and almost all students in the school lived in households with incomes below the federal poverty level. Thus, stereotype threat may not have been affecting these children as much as students in majority-Caucasian schools. For the college sample, students were enrolled in a university where over half of all students identified as an ethnic minority. This sample also resided in a metropolitan area with large numbers of ethnic minority populations. Similar to the middle school sample, the college students' environment may have helped buffer against any potential stereotype threat, leaving little room for the intervention to have an effect. These results are consistent with Bratter, Rowley, and Chukhray's (2016) findings that the self-affirmation intervention did not lead to higher grades for African American or Latino students in majority-minority schools. Future studies should directly measure students' levels of identity threat, as well as threat at the school level, before implementing the intervention to directly test this theory.

Another explanation that seems likely is that the effects of the self-affirmation intervention are simply smaller than we expected at the outset of this study. The two studies reported here had sufficient power to detect medium and large effects of the intervention, such as those reported in previous research studies (e.g., Cohen et al., 2006; Cohen et al., 2009; Sherman et al., 2013). However, much larger sample sizes are needed to detect small effects of this intervention. Hanselman et al., (2016) and others have suggested that the true effects of the self-affirmation interventions may be positive but relatively small when implemented at scale and across heterogeneous contexts. If this is the case, then even very large field trials (e.g., Dee, 2015) are underpowered and unlikely to detect these small effects reliably. This has important implications for future research in this area.

A secondary goal of this study was to compare the effects of the self-affirmation intervention with a more traditional academic intervention that focused on teaching students study skills. In this study, we did not find any differences in grades between students in the cognitive skills control group, students in the self-affirmation intervention group, and students in the control affirmation group. One possible explanation for these null results is that the study skills taught in the cognitive skills intervention were skills that the middle school and college students had already learned. After conducting a content analysis of the written responses to the question, "Have you used any of the tips outlined above? If so, did you find them helpful?", it was apparent that many of the students were aware of the study tips outlined in the intervention and were perhaps already using them to study. Participants also were not given the opportunity to ask questions about the study skills, so it was unclear if they understood why they were important (this may apply particularly to the middle school students). Finally, because we wanted to ensure that the cognitive skills intervention was similar in structure and length to the self-affirmation intervention, the cognitive skills intervention was limited to teaching and writing about four study tips. It is possible that two 20–minute sessions during the semester were not extensive enough to instill proper study skills in students. Future studies should build in opportunities for students to directly practice and apply the study skills after learning about them through the intervention.

The third and final goal of this study was to test potential moderators of the

predicted effects of the self-affirmation intervention using a set of cognitive and socio-psychological variables that have been associated with academic outcomes for both middle school and college students. The variables we included in this study were cognitive ability (college students only), reading fluency (middle school students only), perceived academic control, academic self-efficacy, sense of belonging in school, and stress levels. None of these variables served as a moderator of the self-affirmation intervention. However, as expected, each of these variables was correlated with grades in school. Students who were higher in cognitive ability or reading fluency, perceived academic control, academic self-efficacy, and sense of belonging in school had higher grades, as did students with lower stress levels. Sense of belonging in school was particularly important to our middle school sample, perhaps because these students were experiencing higher levels of prejudice and discrimination outside of school, given their status as first- or second-generation immigrants (Stone & Han, 2005). It is important to note that these variables, particularly perceived academic control, academic self-efficacy, and sense of belonging in school, were highly correlated with each other, so it was difficult to tease apart the effects of individual variables on grades. Overall, though, these results support the targeting of these variables in interventions designed to improve academic performance.

In summary, this study failed to replicate earlier research findings that the self-affirmation intervention would have a positive effect on grades in school for potentially threatened ethnic minority students. There were no differences in grades in school for students in the self-affirmation intervention, students in the control affirmation group, or students in the cognitive skills intervention group for our sample of at-risk Latino middle school students or our sample of ethnically diverse first-year college students. These findings are nonetheless important to report, given the recent emphasis on replication and dissemination of null results in psychological research. These results also shed light on several individual variables that did not moderate the efficacy of the intervention for these two samples of students.

The potential for an easily administered and cost-free intervention to have a positive impact on grades in school, particularly for at-risk groups of students, remains an exciting proposition, and one worthy of future research. However, results of this replication and others (e.g., Dee, 2015; Hanselman et al., 2016) suggest that more work needs to be done to determine the factors that mediate and moderate the effects of the self-affirmation intervention before it is implemented more broadly. Specifically, the results of this study support previous findings (e.g., Bratter, Rowley, & Chukhray, 2016; Hanselman et al., 2015) that the self-affirmation intervention may not be effective for underrepresented minority students in majority-minority schools, and that very large samples are needed to detect the small but positive effects of this intervention that have been reported in previous research.

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