

Demystifying Values-Affirmation Interventions: Writing About Social Belonging Is a Key to Buffering Against Identity Threat

Personality and Social
Psychology Bulletin
39(5) 663–676
© 2013 by the Society for Personality
and Social Psychology, Inc
Reprints and permission:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/0146167213480816
pspb.sagepub.com


Nurit Shnabel¹, Valerie Purdie-Vaughns², Jonathan E. Cook²,
Julio Garcia³, and Geoffrey L. Cohen⁴

Abstract

Two experiments examined for the first time whether the specific *content* of participant-generated affirmation essays—in particular, writing about social belonging—facilitated an affirmation intervention’s ability to reduce identity threat among negatively stereotyped students. Study 1, a field experiment, revealed that seventh graders assigned to a values-affirmation condition wrote about social belonging more than those assigned to a control condition. Writing about belonging, in turn, improved the grade point average (GPA) of Black, but not White students. In Study 2, using a modified “belonging-affirmation” intervention, we directly manipulated writing about social belonging before a math test described as diagnostic of math ability. The more female participants wrote about belonging, the better they performed, while there was no effect of writing about belonging for males. Writing about social belonging improved performance only for members of negatively stereotyped groups. Implications for self-affirmation theory and practice are discussed.

Keywords

identity threat, self-affirmation, social belonging, African Americans, women in science

Received February 27, 2012; revision accepted December 23, 2012

Academic settings can be threatening for negatively stereotyped students, who are often concerned about confirming negative stereotypes about the intellectual ability of their group (G. L. Cohen & Garcia, 2005; Steele, 1997). This “identity threat” may cause stress (Blascovich, Spencer, Quinn, & Steele, 2001) that can undermine academic performance (Steele & Aronson, 1995; see also Walton & Spencer, 2009, for recent meta-analyses). Beyond poor performance, negative relational consequences may also follow, including interpersonal anxiety (Goff, Steele, & Davies, 2008) and feelings of alienation and social disconnection (Cook, Purdie-Vaughns, Garcia, & Cohen, 2012; Walton & Cohen, 2007). African American students in an English Classics course, for instance, may worry not only about being seen as less intellectually able in the minds of others but also about whether their marginalized status hampers the development of relationships across racial lines (Shelton & Richeson, 2006; Walton & Cohen, 2007).

One effective way to buffer students against such stressors is to provide them with opportunities to affirm the self.

Self-affirmation refers to behavioral or cognitive events that bolster the perceived integrity of the self, and the person’s overall image as adequate, effective, and able to control important outcomes (Sherman & Cohen, 2006; Steele, 1988). One common strategy to experimentally manipulate self-affirmation is to instruct participants to write about their core values (McQueen & Klein, 2006). Studies that have used such values-affirmation interventions have found that the small but significant act of writing short essays about one’s core values, such as friends and family, religion, or art, can fortify the self, reduce psychological threat and stress

¹Tel-Aviv University, Israel

²Columbia University, New York, NY, USA

³University of Colorado Boulder, USA

⁴Stanford University, Palo Alto, CA, USA

Corresponding Author:

Nurit Shnabel, School of Psychological Sciences, Ramat Aviv, Tel-Aviv University, Tel-Aviv 69978, Israel.
Email: shnabeln@post.tau.ac.il

(Martens, Johns, Greenberg, & Schimel, 2006), and improve the academic performance of stigmatized group members (G. L. Cohen, Garcia, Apfel, & Master, 2006; G. L. Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009; Martens et al., 2006; Miyake et al., 2010). Specifically, in randomized field experiments in middle school (G. L. Cohen et al., 2006; G. L. Cohen et al., 2009) and college (Miyake et al., 2010), ability-stereotyped students who engaged in such affirmation exercises earned higher academic grades.

Why and how do values-affirmations consistently produce these outcomes? Recent advances in self-affirmation theory point to three consecutive processes (Sherman & Hartson, 2011). These include boosting self-resources to cope with a threat (as manifested, for example, in reduced ego-depletion effects; Schmeichel & Vohs, 2009). This, in turn, can broaden individuals' perspective on threat (e.g., shifting levels of construal; Wakslak & Trope, 2009) so that it becomes less psychologically dire, which may in turn lead one to acknowledge the threat without negative effects on psychological well-being (e.g., "untethering" one's sense of belonging in school from poor performance; Cook et al., 2012). These proposed processes occur downstream in the affirmation process (i.e., reflecting about important personal values may elicit these processes). The current research focused on processes that operate further upstream, when individuals initially select and express their important values. Specifically, our goal was to identify whether a specific theme present in values-affirmation essays acts as an "active ingredient" without which the positive effects of these essays on the academic performance of negatively stereotyped students would be less likely to occur.

Our central argument is that *writing about social belonging themes* (i.e., how an important value makes one feel more connected to other people) is such an "active ingredient." We tested our hypothesis in two studies: using a "bottom-up" approach, Study 1 involved a content analysis of the values-affirmation essays written by the African American and White seventh graders who participated in G. L. Cohen and colleagues' (G. L. Cohen et al., 2006; G. L. Cohen et al., 2009) randomized field experiments. The content of these students' essays was analyzed in the present research for the first time. Specifically, we examined whether students assigned to the affirmation condition wrote more about social belonging than students in the control condition, and whether writing about belonging, in turn, mediated the improvement in academic performance among African American, but not White students. Study 2 involved a laboratory experiment with a different group that contends with threat, specifically, female students taking a math test. We experimentally manipulated the proposed mediator (i.e., writing about social belonging) and examined whether the effectiveness of the affirmation at raising the performance of a stereotype-threatened group (i.e., women in Math) was enhanced by instructions encouraging students to focus more on how their values bring them closer to other people.

Despite the semantic similarity, our research diverges from Walton and Cohen's (2007, 2011) previous research on "belongingness uncertainty" in terms of its main goal and its conceptualization of social belonging. Specifically, the goal of the present research was to understand what contents may drive the effects of affirmation interventions, and in a more general sense, what contributes to psychological resiliency in threatening situations. By contrast, Walton and Cohen did not examine affirmation processes. Rather, they focused on a "social belonging" intervention that sought to buffer stigmatized group members against experiences with marginalization in college. Their intervention conveyed that difficulties in college are common and transient, and thus not unique to oneself or one's group (Walton & Cohen, 2011). Moreover, Walton and Cohen focused on stigmatized group members' sensitivity to information diagnostic of their fit in their specific academic environment, what they termed "belonging uncertainty" (e.g., in the computer science department; Walton & Cohen, 2007). By contrast, the present research conceptualized belonging more broadly, trying to capture the general experience of having meaningful social bonds with family members, friends, and others who are not necessarily part of students' academic environment. In summary, though there are interesting connections to the present research, this previous research addressed different theoretical constructs and processes.

Writing About Social Belonging Is a "Key Ingredient"

We defined essays on social belonging as focusing on how an important personal value (e.g., artistic values, religion, relationships) makes one feel closer to and more connected with other people or promotes the experience of having and enjoying positive social bonds. To illustrate, the essay below, which demonstrates belonging themes, was written by an African American seventh-grade student who participated in Study 1:

My friends and family are most important to me when I have a difficult situation that needs to be talked about. My friends give me companionship and courage. My family gives me love and understanding.

Our definition of social belonging is consistent with definitions of belonging that focus on forming and maintaining positive interpersonal relationships (e.g., Baumeister & Leary, 1995). It also dovetails with research on the sources of perceived social support such as ordinary yet meaningful conversations and shared activities with significant others (Lahey & Orehek, 2011). We converged on the proposition that social belonging is the active ingredient in values-affirmation exercises based on a wide range of social and personality theories that begin with the premise that people's connections with significant others are tied to their sense of

self (e.g., Andersen & Chen, 2002; Aron, Aron, & Norman, 2001; Cialdini, Brown, Lewis, Luce, & Neuberg, 1997; Cross, Bacon, & Morris, 2000; Leary & Baumeister, 2000; Markus & Kitayama, 1991). For example, attachment theory (Bowlby, 1988) suggests that the internal representation of the bond with significant others may serve as a symbolic shield that helps individuals to cope with threats to their selves (Mikulincer & Shaver, 2007). In light of these theories, affirmation of the self may in fact involve an affirmation of one's social bonds. Stated differently, when people select and write about a self-defining value, they may spontaneously affirm their connections with cherished others, which, in turn, should affirm the self.

In addition, when confronted with threat, people turn to reminders of positive social bonds and connections with significant others. For instance, participants who spontaneously affirmed themselves (i.e., wrote statements about valued self-domains) when writing about major life events and traumatic experiences wrote about themes related to valued relationships 75% of the time; only 25% of their statements related to other domains such as religion and faith or career and education (Creswell et al., 2007). Similarly, Crocker, Niiya, and Mischkowski's (2008) research on smokers' acceptance of threatening health information found that smokers who wrote about important values increased their positive other-directed feelings, such as love and connectedness with significant others, which in turn helped them transcend concerns about self-worth and respond more constructively to threats.

Beyond the potential of writing about social belonging themes to confront threats in general, we reasoned that it should be particularly effective in buffering against identity threats. Our reasoning was based in part on theorizing that conceptualizes negative stereotyping as a form of social rejection threat and on empirical findings suggesting that rejection threats can be repaired or reduced only through direct affirmation of this particular self-domain (i.e., affirmation of one's sense of belonging).

Specifically, it has been recently argued that discrimination and ongoing devaluation due to stigmatization should be viewed as a form of social rejection that threatens one's sense of belonging (Smart Richman & Leary, 2009). Supporting this argument, empirical evidence has confirmed that both the experience of social rejection threat (Baumeister, Twenge, & Nuss, 2002) and identity threat (e.g., Inzlicht, McKay, & Aronson, 2006) interfere with participants' or stigmatized group members' self-regulation and cognitive functioning. Similarly, both social rejection threat (Twenge, Catanese, & Baumeister, 2002) and stereotype threat (e.g., Stone, 2002) increase threatened individuals' or group members' engagement in self-defeating behavior (e.g., procrastination or less practice for a test). Finally, both social rejection threat (Baumeister et al., 2002) and identity threat (e.g., Steele, 1997) were found to lead to poorer academic performance such as lower IQ or (Graduate Record Examinations)

GRE scores. Thus, overall, converging findings support the notion that identity threat can be conceptualized as a social rejection threat.

Given that stigmatized group members experience a social rejection threat that can threaten their feelings of self-integrity, it seems plausible that this threat will be most effectively removed through belonging-affirmation. According to Knowles, Lucas, Molden, Gardner, and Dean (2010) one's sense of belonging is a unique and fundamental source of self-integrity and esteem (see Baumeister & Leary, 1995; Leary & Cox, 2008) that requires specific repair when threatened. This characteristic of one's sense of belonging is distinct from nonsocial sources of self-integrity, which function interchangeably and can substitute for each other (see Steele, 1988; Tesser, 2000, 2001). Consistent with this argument, threats to one's self-worth in a nonsocial domain were effectively removed in one study through "indirect-affirmation," that is, affirmation of one's self-worth in other domains (Knowles et al., 2010, Study 4). In contrast, indirect-affirmation failed to restore participants' sense of self after belonging threats, which led Knowles and colleagues to conclude that "social threats may only truly be repaired by affirming the strength of one's social connections" (Knowles et al., 2010, p. 182). Affirming social bonds and sense of belonging should thus be a particularly efficient strategy to address stigmatized group members' experience of identity threat, which should in turn lead to improved academic performance. The present study was designed to test this hypothesis.

The Present Research

Mediators through which values-affirmation interventions reduce identity threat and improve academic performance among negatively stereotyped group members have eluded previous investigations. For example, although G. L. Cohen and colleagues (2006) found evidence of reduced activation of racial stereotypes among Black students who affirmed their values, this activation was not associated with academic performance. Similarly, Cook and colleagues (2012) found that a sense of belonging in school (i.e., feeling of academic fit) was greater among affirmed than nonaffirmed Black students, but this feeling was not associated with the affirmed students' grades.

The present study was designed to identify an upstream mediator. Specifically, we hypothesized that writing about social belonging themes would mediate the positive effects of values-affirmation interventions on academic performance of Black seventh graders in a natural classroom setting (Study 1) and on the performance of female college students taking an identity-threatening math exam in a lab setting (Study 2). Importantly, Study 2 was designed to increase the internal validity of the conclusions of Study 1 through a direct manipulation of our proposed mediator, as suggested in recent methodological recommendations (see Spencer, Zanna, & Fong, 2005; Stone-Romero & Rosopa,

2008). Moreover, by using a different stereotyped group, age range, and experimental setting (lab vs. field), Study 2 aimed to increase the generalizability of the conclusions of Study 1 regarding the critical importance of social belonging themes.

Together, these two studies were designed to contribute to our understanding of mediating processes through which values-affirmation interventions counteract identity threats. Despite the prevalence of affirmation research (see Aronson, Cohen, & Nail, 1999; Harris & Epton, 2010; McQueen & Klein, 2006; Sherman & Cohen, 2006; Sherman & Hartson, 2011, for reviews), little research has examined the content of affirmation essays to discern whether the theme participants write about what drives their positive effects (see Burson, Crocker, & Mischkowski, 2012, for an exception). Identifying such themes can make both theoretical and practical contributions. Theoretically, it may point to the conditions that lead affirmation interventions to be effective. Practically, focusing on the content of the affirmation essays, rather than on their psychological consequences (e.g., cognitive appraisals, Sherman, Bunyan, Creswell, & Jaremka, 2009; or emotional experiences, Crocker et al., 2008), may suggest concrete refinements to the affirmation intervention that could enhance its efficacy. Specifically, affirmation instructions could be revised to encourage people under conditions of identity threat to write about the themes revealed to correlate with performance gains (i.e., social belonging). Identifying refinements to the standard values-affirmation intervention serves an obvious practical purpose as these interventions can help to remedy one of the most pressing and enduring educational challenges of our time—achievement gaps in academic settings.

Study 1

Study 1 extends previous research in which affirmation interventions delivered in early seventh grade were found to significantly improve the grade point average (GPA) of Black, but not White students and reduce the racial achievement gap over a 2-year period in middle school (G. L. Cohen et al., 2009). Performance declines are common in middle school (Eccles, Lord, & Midgley, 1991), but they are particularly steep for Black students. The intervention successfully buffered Black students against such performance declines (G. L. Cohen et al., 2006), but no specific mediator was identified. The goal of Study 1 was to examine the content of students' affirmation essays to test whether writing about social belonging constitutes such a mediator.

In particular, we tested for a conditional indirect effect (Preacher, Rucker, & Hayes, 2007; aka “moderated mediation,” in which the strength of an indirect effect, such as the effect of values-affirmation on GPA through writing about belonging, depends on the level of a particular moderator, such as racial group). Consistent with research showing that individuals who spontaneously affirmed themselves when instructed to write “expressive writing” essays tend to write

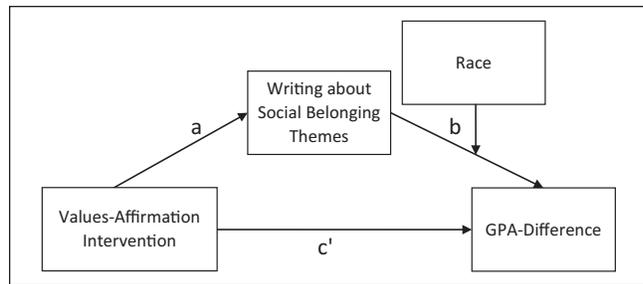


Figure 1. The proposed model of conditional indirect effect.

Note: GPA = grade point average.

about positive social bonds with others (Creswell et al., 2007), we hypothesized that regardless of race, students in the affirmation condition would write more about social belonging than students in the control condition. However, because in most intellectual settings, Black students contend with identity threat, writing about social belonging was expected to be especially helpful for this group and account for their improved GPA in the affirmation condition. In contrast, because their identity is not threatened in intellectual settings, and the affirmation did not have a consistent effect on White students' GPA, writing about belonging was not predicted to benefit their GPA. Figure 1 illustrates the proposed model.

Method

Participants. Participants were 169 Black and 186 White seventh graders¹ (48% male) of middle-class to lower-middle-class socioeconomic status (SES) who participated in Cohen and colleagues' (G. L. Cohen et al., 2006; G. L. Cohen et al., 2009) randomized field experiment across three cohorts. Because results did not vary by cohort, cohorts were combined to increase statistical power.

Experimental Procedure. Seventh-grade students in a school whose student body was almost evenly divided between Blacks and Whites took part in the study (three successive years, for three different cohorts). Students were randomly assigned within classrooms to the values-affirmation or control condition. Teachers were unaware of the research hypotheses or students' condition assignment.

The experimental manipulation followed procedures validated in prior research (McQueen & Klein, 2006). In both conditions, students reviewed a list of values (12 in the first cohort and 11 in the second and the third), such as relationships with friends and family or being good at art. Students in the affirmation condition were asked to indicate their most important values and write about why their selected values were important to them. Students in the control condition indicated their least important values and wrote about why their values might be important to someone else. The manipulation, presented by teachers as part of regular classroom

activities, occurred at the beginning of the fall quarter (specifically, mid- to late October in the first cohort, and mid- to late September in the second and third cohorts). During this quarter, about 1 month following the original intervention, participants in the second and third cohorts (but not the first cohort) completed an additional intervention (i.e., they wrote one more values-affirmation or control essay). Because the number of interventions appears unrelated to GPA in the first term of the intervention (G. L. Cohen et al., 2009; Cook et al., 2012) or academic belonging (Cook et al., 2012) and the benefit of the affirmation seems to depend disproportionately on the first, earlier intervention, at least for the first-term grades (Cook et al., 2012), we included only the first intervention essay in our content analysis.

Content analysis. Writing about belonging was defined as explicitly mentioning in an essay that (a) one values an activity because it is done with others (e.g., “Athletics is important to me because I like to work out with my brother”), or (b) one feels part of a group of people because of a certain value or while engaging in a certain activity (e.g., “I feel part of a team when I play music with my band”), or (c) any related thoughts on the subject of one’s social belonging, such as being affiliated to or liked by others (e.g., “Friends and family are important to me because they are always there for me”). Examples of essays that did not include belonging themes include, “My grades are important to me because I want to get into a good college” (affirmation condition) or “Politics would be very important to someone else when voting for the president, mayor, governor etc.” (control condition).

For each essay, two coders independently judged whether it included writing about social belonging (0 = *no*, 1 = *yes*). Initial agreement between the two coders was 95%, and Cohen’s kappa was .90, representing high agreement (Landis & Koch, 1977). Cases of disagreement were resolved by a third coder.

Measures. The dependent measure was students’ postintervention change in GPA (consistent with G. L. Cohen et al., 2006), calculated by subtracting their preintervention performance (i.e., the average of their sixth-grade GPA and preintervention seventh-grade GPA) from their grades at the end of the first quarter of seventh grade. A positive value for this variable—GPA-Difference—was obtained when GPA improved during the first quarter, whereas a negative value was obtained when GPA dropped.

Our choice of GPA-Difference as our main dependent variable was motivated by our wish to present results in an intuitive manner, so that negative results indicate decline in performance and positive results indicate improvement. Conceptually, identical results were obtained when raw GPA was used as the dependent variable.

Results

We conducted a logistic regression to examine the effects of race and condition on the categorical variable indicating

writing about belonging themes. The main effects of Race and Condition were entered in Step 1 and their interaction was entered in Step 2. Step 1 revealed that adding the effects of race and condition significantly improved model fit, $\chi^2(2) = 107.76, p < .001$. As predicted, a significant main effect for the experimental condition ($p < .001$) revealed that the percentage of essays that included belonging themes was significantly higher in the affirmation compared with the control condition. Specifically, only 8.3% of control essays included writing about belonging compared with 57.5% of the affirmation essays. The frequency of writing about belonging did not vary by race ($p > .247$). Finally, adding the interaction term in Step 2 did not improve model fit, $\chi^2(1) = .54, p > .463$.

Next, consistent with previous reports (see G. L. Cohen et al., 2006; G. L. Cohen et al., 2009), we found a significant race by condition interaction, $F(1, 342) = 16.05, p < .001$,² on GPA-Difference. The positive effect of values-affirmation was limited to Black students, whose GPA-Difference in the affirmation condition ($M = +0.082$) was buffered against the performance decline found in the control condition ($M = -0.191$), $F(1, 342) = 18.13, p < .001$. White students’ GPA did not differ by condition, $F(1, 342) = 1.84, p > .176$ ($M_s = -.132$ vs. $-.051$ in the affirmation and control conditions, respectively.) All means are covariate adjusted.

Conditional Indirect Effect. To test our main hypothesis, we used Preacher et al.’s (2007) MODMED macro, which allowed us to test the indirect effect (i.e., $a \times b$; see Figure 1) of affirmation on GPA through social belonging themes as a function of race. (The key Belonging \times Race interaction and indirect effect were unchanged when a path analysis approach was used.) Results are presented in Table 1.³

First, consistent with our hypothesis that when people affirm themselves they often turn to their relations with significant others, writing about social belonging was significantly greater in the affirmation condition compared with the control condition. The test of this main effect of condition on writing about belonging is presented in the upper part of Table 1.

Second, as can be seen in the middle part of Table 1, the effect of writing about belonging on GPA-Difference was moderated by race (i.e., the two-way interaction between race and writing about belonging was significant). This finding would be expected given our prediction that writing about belonging would have a positive effect on Black students’ GPA-Difference but would not affect the academic performance of White students.

Finally, the lower part of Table 1 presents the tests of indirect effects for each race. For Black students, consistent with predictions, writing about belonging significantly mediated the positive effect of values-affirmation on their GPA. Thus, Black students assigned to the affirmation condition wrote about belonging themes more than Black students assigned to the control condition, and writing about

Table 1. Regression Results for Conditional Indirect Effect.

Predictor	B	SE	t	p		
Writing about social belonging themes						
Constant	.169	.099	1.711	.088		
Self-affirmation intervention	.494	.042	11.774	.000		
GPA-Difference						
Constant	-.402	.122	-3.289	.001		
Self-affirmation intervention	.101	.052	1.935	.054		
Belonging	-.195	.071	-2.750	.006		
Race	-.079	.057	-1.379	.169		
Belonging × Race	.347	.095	3.648	.000		
Race	Boot indirect effect	Boot SE	Boot Z	Boot P	LLCI	ULCI
White	-.097	.037	-2.596	.009	-.175	-.026
Black	.075	.037	2.053	.040	.007	.151

Note: GPA = grade point average. $N = 355$ (169 Blacks, 186 Whites). Unstandardized regression coefficients are reported. Bootstrap sample size = 5,000. LLCI = lower level of the 95% bootstrap percentile confidence interval; ULCI = upper level of the 95% bootstrap percentile confidence interval. Condition and Race were dummy coded such that Control = 0 and Affirmation = 1, similarly, White = 0 and Black = 1. Note that because belonging and race are uncentered, their lower order effects should be interpreted in light of the significant interaction (i.e., the lower order effect of belonging represents its effect for Whites; the lower order effect of race represents its effect for participants with a belonging score of 0). Although the MODMED macro uses ordinary least squares (OLS) regression, both OLS and logistic regression often yield the same decision criteria (Pohlmann & Leitner, 2003). By example, the OLS analysis of condition on belonging, reported in the upper part of Table 1, yields the same decision as the logistic regression analysis reported on Page 15 (i.e., both analyses revealed a significant effect of condition on writing about belonging). As our goal was to test the significance of the relations between these variables rather than report precise population estimates, the OLS approach in MODMED was appropriate. In addition, the critical Belonging × Race interaction and indirect effect remained significant using a path analysis approach that explicitly modeled belonging as a dichotomous variable.

belonging, in turn, was associated with positive change in GPA. Unexpectedly, the indirect effect for White students was also significant but in the opposite direction. White students assigned to the affirmation condition wrote about belonging more than those assigned to the control condition, but among White students writing about belonging was associated with a *drop* in GPA.

Importantly, consistent with the logic of self-affirmation theory (Sherman & Cohen, 2006), the effect of writing about belonging was not confined to choosing any *particular value*. Although writing about belonging correlated with choosing the value “relationships with friends and family” ($r = .52, p < .001$), choosing this value did not mediate the indirect effects of the affirmation intervention on either Blacks’ ($p > .115$) or Whites’ ($p > .755$) GPA-Difference. Hence, it was writing about social belonging, which included essay content on both social (e.g., friends and family) and nonsocial (e.g., music) values, which captured the content that critically affected Black students’ academic improvement.

Furthermore, the results were limited to writing about belonging rather than about other topics. We tested for conditional indirect effects for the two most frequent themes besides belonging that appeared in intervention essays—coping with negative events or emotions (included in 29% of the affirmation and 9% of the control essays), and academic success (included in 28% of the affirmation and 24% of the control essays). Neither of these themes mediated the

positive effect of the affirmation condition on Black students’ academic grades ($ps > .681$).

Discussion

Study 1 supported our hypothesis that writing about social belonging themes mediated the positive effect of values-affirmation interventions on Black students’ academic performance. Seventh graders assigned to the affirmation condition spontaneously wrote about belonging (e.g., why or how a certain value made them feel affiliated with others) more than those assigned to the control condition, and writing about belonging, in turn, led to improved GPA among Black students (i.e., it effectively prevented performance decline). Unexpectedly, writing about belonging related to poorer performance for White students. We further discuss this issue in the “General Discussion” section. Nevertheless, results support the predicted role of writing about social belonging for Black students’ performance.

Study 2

The goal of Study 2 was to strengthen the internal and external validity of Study 1. First, to address criticism of “measurement-of-mediation” designs and allow for strong inferences about the hypothesized causal chain (Spencer et al., 2005; Stone-Romero & Rosopa, 2008), Study 2 directly manipulated the proposed mediating variable (writing about

belonging themes) and examined its effect on the outcome variable (academic performance). Experimentally manipulating themes of belonging allowed us to draw strong inferences with regard to their causal role in affirmation effects.

Study 2 also tested our hypotheses in the context of individuals completing a single test in the laboratory rather than students in classrooms over extended periods of time. While Study 1 had the advantage of offering evidence of causal processes in actual classrooms, it remained unclear whether the findings were conditioned on factors such as students' social relationships, the classroom setting, in which minority students can be chronically vigilant for cues confirming or refuting the threat of being treated discriminatorily (G. L. Cohen & Garcia, 2008), or the passage of time. For example, writing about belonging may have led Black students to affiliate more with their classmates, and this actual social support may have protected them from performance decline. To rule out these possibilities, Study 2 examined whether findings similar to Study 1 emerged under the controlled conditions of a single test in the lab.

Moreover, to further extend the generalizability of our findings, Study 2 focused on a different stereotyped group: women in the context of math ability. Identity threat has been found to undermine the performance of women in mathematics, particularly when women face a challenging task and when stereotypic assumptions of gender differences in performance are not specifically dismissed (Spencer, Steele, & Quinn, 1999). This was the case in Study 2, where participants confronted an extremely difficult math test and the instructions did not explicitly dispel the existence of gender differences (which would reduce identity threat; Spencer et al., 1999).

Perhaps most important, to the best of our knowledge, Study 2 is the first to test a strategy to enhance the effectiveness of the standard values-affirmation task by directing participants to write about belonging themes in their affirmation essays. Values-affirmation exercises are ideal candidates for large-scale implementation in educational settings because they constitute a brief and inexpensive strategy to reduce existing achievement gaps between stigmatized and nonstigmatized groups (Yeager & Walton, 2011). To the extent that such scaling will take place in the future, every improvement in the standard values-affirmation could have substantial real-life consequences.

Male and female participants were randomly assigned to one of four experimental conditions: a *no-affirmation* condition in which participants wrote about why a value unimportant to them would be important to someone else, an *individuating-affirmation* condition in which they wrote about why their important value made them feel independent or self-sufficient, a *standard-affirmation* condition in which participants wrote about why their value was important to them, and a *belonging-affirmation* condition in which participants wrote about why their value made them feel closer and more connected with other people. The *no-affirmation*

and *standard-affirmation* conditions corresponded to the control and experimental conditions used in Study 1.

Our rationale was that variations in the affirmation exercise would influence the frequency with which participants wrote about social belonging. Accordingly, in the *no-affirmation* condition, the percentage of essays with social belonging themes was predicted to be the lowest. In the *individuating-affirmation* condition, the frequency of social belonging themes was expected to be greater than the *no-affirmation* control but lower than the *standard-affirmation* condition. Finally, social belonging themes were predicted to be the greatest in the *belonging-affirmation* condition, which explicitly asked participants to write about how their important values contributed to positive social bonds with others.

Following the affirmation exercise, participants completed a difficult math test similar to the GRE math exam. Consistent with previous research, we hypothesized that women would perform worse than men in the no-affirmation condition, as women are negatively stereotyped in math (e.g., Spencer et al., 1999), but that this gap would be reduced in the affirmation conditions. Furthermore, we expected that as the frequency of social belonging themes increased across conditions, female participants' math performance would improve linearly. For male participants, who do not contend with negative stereotypes about quantitative ability, performance was expected to be unaffected by condition.

Method

Participants. Participants were 62 male and 55 female White undergraduate students from a large liberal arts university in the Western United States. They were recruited from an introductory psychology class and were compensated with either course credit or payment. Ages ranged from 18 to 30 ($M = 19.8$, $SD = 2.00$). Participants were randomly assigned to condition.

Procedure. The experiment was carried out in an environment set up like a classroom, in groups of three to nine participants who were seated at two-person tables (each participant sat alone). The experimenter sat at a table in front of the classroom and was present during the whole experimental session. Participants were told that they would participate in two separate studies: the first exploring values, the second about how people solved math problems. The ostensible first study constituted the values-affirmation manipulation. All participants were presented with the same list of 11 values used in previous affirmation research with adults (G. L. Cohen, Aronson, & Steele, 2000) and asked to rank them in order of personal importance. Next, participants in the *no-affirmation* condition wrote a brief essay describing why their ninth most important value might be important to someone else. In the affirmation conditions, they wrote about why their top-ranked value (a) made them feel independent and

self-sufficient (*individuating-affirmation*), (b) was important to them (*standard-affirmation*), or (c) made them feel closer and more connected with people (*belonging-affirmation*). When all participants completed the affirmation task, they were thanked and told that they would now move to the second study. In this ostensible second study, participants completed an extremely difficult math test labeled “UC Santa Barbara Math Assessment Test,” which consisted of 30 multiple-choice questions. In all conditions, the cover page of the test contained brief instructions informing participants that they would have 20 min to complete the test. The instructions also informed participants that to get the best assessment of their current ability, it was very important for them to do their best on the test. Participants earned one point for each correct answer. Following the test, participants were thanked and debriefed.

Results

To check our manipulation, we assessed whether the different conditions successfully produced different frequencies of social belonging themes. For each essay, one trained coder judged whether it included social belonging (0 = *no*, 1 = *yes*). The same validated coding system used in Study 1 was used here. Sample excerpts from the essays included, “Politics is an important value; however, it is not a huge concern to me” (*no-affirmation*), “Without the support of my parents I wouldn’t have gone out of state and become as independent as I am” (*individuating-affirmation*), “Having good relationships with friends and family is very important to me. Without them it would be hard to get by” (*standard-affirmation*), and “My friends and I enjoy cracking jokes about anything. It makes me feel more connected with them” (*belonging-affirmation*).

A logistic regression was conducted to examine the effects of the experimental condition and participants’ gender on the categorical variable indicating writing about belonging themes: Gender and Condition (coded as three dummy-variables with the control condition as reference group) were entered in Step 1, the interactions between gender and each of the affirmation conditions (i.e., the three dummy-variables) were entered in Step 2. Step 1 revealed that adding the effects of gender and the affirmation conditions significantly improved model fit, $\chi^2(4) = 50.46, p < .001$. Specifically, a marginal effect for Gender ($p < .083$) indicated that women tended to include belonging themes in their essays more than men did (66% of women’s essays compared with 55% of men’s essays included these themes). Of direct relevance for the purposes of the present study, as intended, the three affirmation conditions significantly increased the inclusion of belonging themes in participants’ essays compared with the control condition ($ps < .001$). Specifically, only 15% of essays in the no-affirmation condition included social belonging themes, compared with 60%, 63%, and 97% of the essays in the individuating-affirmation, standard-affirmation, and

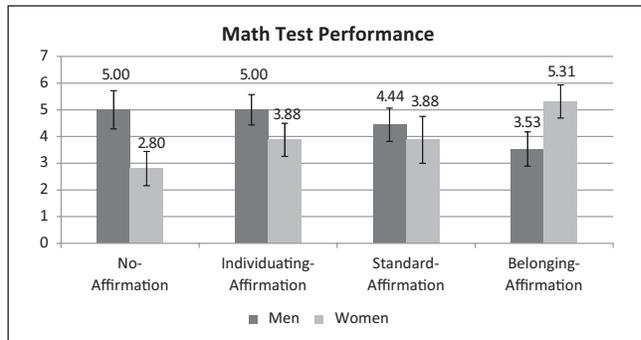


Figure 2. Mean number of correct answers and standard errors for math performance among male and female participants as a function of affirmation condition.

belonging-affirmation conditions, respectively. Note that despite the fact that our instructions in the individuating-affirmation condition directed participants to focus on independence and self-sufficiency, this condition yielded similar frequency of writing about belonging themes to that obtained in the standard-affirmation condition. As the sample excerpt from this condition illustrates, the two themes (i.e., independence and belonging) need not be incompatible. For instance, participants may refer to their family as a secure base that allows them to independently explore the world. Although adding the three interaction terms in Step 2 significantly improved model fit, $\chi^2(3) = 8.28, p < .041$, none of the interaction terms was significant ($ps > .724$). The only pattern was a tendency for men to be less likely than women to write about belonging in the standard affirmation condition.

We next tested our primary hypotheses that (a) women’s performance would be worse than men’s in the no-affirmation condition but (b) the gender gap in performance would decrease in the affirmation conditions. A two-way ANOVA revealed no main effects ($ps > .268$) and the predicted gender by affirmation condition interaction, $F(3, 109) = 3.40, p < .021, \eta_p^2 = .086$ (see Figure 2). Simple effects tests indicated that (a) women performed worse than men in the no-affirmation condition, $F(1, 109) = 5.23, p < .025, \eta_p^2 = .046$; (b) the gender gap was eliminated in the individuating-affirmation condition, $F(1, 109) = 1.79, p > .184, \eta_p^2 = .016$, and in the standard-affirmation condition, $F(1, 109) = .27, p > .601, \eta_p^2 = .003$; and (c) the gender gap reversed in the belonging-affirmation condition, $F(1, 109) = 3.97, p < .049, \eta_p^2 = .035$.

To examine whether women performed *better* when assigned to affirmation conditions where participants spontaneously wrote more about belonging (i.e., the individuating and standard-affirmation conditions) and the condition where participants wrote most about belonging as instructed (i.e., the belonging-affirmation condition), we conducted a linear contrast, assigning the values “-2,” “-1,” “+1,” and “+2” to the no-affirmation, individuating-affirmation, standard-affirmation, and belonging-affirmation, respectively. Consistent

with our hypothesis, the linear contrast was significant, $F(1, 109) = 5.82, p < .018$, and accounted for 82% of the between-cell variance among women; the quadric and cubic contrasts were not significant, $ps > .282$. The same linear trend undertaken for men was not significant, as expected, $F(1, 109) = 2.77, p > .098$. Indeed, if anything, there was a trend for conditions that elicited more writing about social belonging to be associated with poorer performance for men. Finally, the difference in linear trends between men and women was significant, $F(1, 109) = 8.30, p < .005$, indicating that for women, but not for men, assignment to conditions that elicited more writing about social belonging improved performance on the math test.

We conducted a final contrast to examine whether women in the belonging condition, which yielded the *highest* percentage of essays that included social belonging themes, led to *better* performance compared with the other affirmation conditions, which yielded moderate percentage of essays that include social belonging themes. Because the individuating and standard-affirmation conditions failed to yield different proportions of social belonging themes, we collapsed these two affirmation conditions. The contrast between women's performance in the belonging-affirmation condition compared with their performance in the combined individuating and standard-affirmation conditions was marginally significant, $F(1, 109) = 3.06, p < .083, \eta_p^2 = .027$, suggesting that affirmations especially focused on belonging tended to yield greater benefits than other affirmations. Of course, given that the standard- and individuating-affirmation conditions also elicited substantial writing about belonging, this is a conservative test.

Although the results supported our hypotheses, they may be accounted for by two alternative explanations. First, it was possible that men and women picked different values as their most (or least) important and hence, even when assigned to identical experimental conditions, they actually wrote about different values in their essays. For example, to the extent that women picked "relations with family and friends" whereas men picked "independence" as their most important value, it might have been harder for men than for women to follow the instructions of the belonging-affirmation condition (i.e., think about how your most important value makes you feel closer and connected to other people). Correspondingly, it might have been harder for women to follow the instructions of the individuating-affirmation condition. If so, the difficulty of the writing task rather than the affirmation condition itself might have affected participants' math performance by, for instance, impairing women's performance in the individuating condition and men's in the belonging condition. A chi-square test examining the association between participants' gender and the value that they wrote about (i.e., their most important value in the affirmation condition and a less important value in the control condition) ruled out this possibility, $\chi^2(8) = 12.23, p = .141$ (two values—sports ability and membership in a social group

such as community or school club—were not picked by any participants, reducing degrees of freedom).

A second alternative explanation that may explain our results is also possible. Women tend to represent themselves in terms of their communal attributes, such as nurturing, whereas men tend to represent themselves in terms of their agentic attributes, such as forceful and self-sufficient (Diehl, Owen, & Youngblade, 2004). It is possible that women may have found following the instructions in the belonging-affirmation condition easier than men because the instructions were more congruent with their perceptions of themselves as communal, leading them to easily retrieve belonging-relevant examples in their essays. By contrast, following the instructions in the individuating-affirmation condition may have been easier for men. For women and men, the difficulty of the writing task, rather than gender stereotypes about math ability, may have determined participants' subsequent performance on the math test.

To the extent that the above "congruency hypothesis" is true, we would expect to find similar gender effects in Study 1, such that female seventh graders should benefit from writing about belonging more than male seventh graders. To test this possibility, we conducted an additional analysis on data from Study 1. When we tested the model of conditional indirect effect examined in Study 1 with gender instead of race as the moderator of the path from writing about belonging to GPA-Difference (see Figure 1), the Belonging \times Gender interaction was not significant ($p > .162$), indicating that the effect of writing about belonging on participants' GPA was not moderated by gender. Moreover, while the indirect effect for male students was marginally significant ($Boot p < .107; M_{\text{GPA-Diff}} = -.223$ vs. $-.009$ in the control and affirmation conditions, respectively), it was far from significance for female student ($Boot p > .733; M_{\text{GPA-Diff}} = -.020$ vs. $-.052$ in the control and affirmation conditions, respectively). These findings suggest that in a context where the most salient threat was related to racial rather than to gender identity, girls did not benefit from writing about belonging (if anything, it was boys who benefitted more from the intervention in general and from writing about belonging in particular). It is hence likely that the effectiveness of the belonging-affirmation on women's performance found in Study 2 stemmed from the successful reduction of stereotype threat among our female participants.

Discussion

The results of Study 2 provide support for our hypothesis that explicitly reflecting about social belonging themes is an active ingredient through which values-affirmation counteracts stereotype threat, in this case, among women in math. Importantly, as in Study 1, participants in the standard values-affirmation assignment often wrote about belonging and the intervention eliminated the gender gap in performance. Nevertheless, the subtle variations in the affirmation instructions affected female participants' math performance such

that directed prompts to write about belonging most improved women's performance.

General Discussion

The present research demonstrates that writing about social belonging themes is a key ingredient in the effectiveness of affirmation interventions at improving performance among negatively stereotyped groups. Such interventions might be less effective when the essays written by stigmatized group members revolve around other topics. To the best of our knowledge, this is the first research that identifies particular content that leads values-affirmation interventions to be effective. Results are robust, having been found experimentally in both the laboratory and the field, using two separate groups that confronted negative stereotypes about their general or domain-specific intellectual ability. Study 1 demonstrated that writing about social belonging accounted for the positive effect of the affirmation intervention on the GPA of Black seventh-grade students. Study 2 showed that varying the extent to which affirmation exercises elicited social belonging themes improved the performance of female college students on a math exam. Together, our findings suggest that reminders of relational connections boost one's ability to perform well academically in the face of identity threats.

Our research advances understanding not only of values-affirmation interventions in particular but contributes to self-affirmation theory in general. Current affirmation theory focuses on abstract (i.e., content-free) psychological processes (i.e., boosting self-resources, broadening individuals' perspective on threat, and increasing individuals' ability to evaluate threats independently of ego-defensive concerns; see G. L. Cohen, Purdie-Vaughns, & Garcia, 2012; Sherman & Hartson, 2011). However, many well-documented psychological processes previously hypothesized to be content-free have been shown to be highly dependent on particular themes. Our research can similarly inform affirmation theory by suggesting that the processes set in motion through self-affirmation interventions may be facilitated when these interventions involve a specific theme, that is, social belonging.

Of course, the proposition that affirmation processes are facilitated when people write about social belonging themes requires further research. One limitation of the present research is that it used only middle school minority students and women from an introductory psychology course. Writing about belonging might have different and even negative effects for other groups or under different circumstances. For instance, it might cause women in an individualistic or male-dominated class or profession to worry about being seen in light of gender stereotypes of communality. In addition, the present research focused on buffering against identity threats, which may be viewed as threats to one's sense of belonging (Smart Richman & Leary, 2009). It is possible that belonging themes serve as a key ingredient in buffering against social threats but not in buffering against nonsocial threats, where

other contents may be effective as well. This possibility is consistent with Knowles and colleagues' (2010) reasoning that the different dimensions on which one may affirm oneself in response to threats are organized hierarchically. Due to the primacy of belonging needs (Baumeister & Leary, 1995; Leary & Cox, 2008), when people face social rejection threats, as was the case in the present studies, these threats may be mitigated primarily (and perhaps even exclusively) by affirming one's sense of belonging. By contrast, threats to nonsocial (and hence less fundamental) dimensions of their selves may be effectively mitigated by the affirmation of any important self-domain, including both social and nonsocial ones.

Admittedly, the buffering effect of social belonging themes in contexts of nonsocial threats awaits direct empirical testing. Nevertheless, based on the findings that feelings of love and connectedness—possibly evoked by writing about social belonging—mediated the effects of values-affirmation in buffering against a nonsocial threat (i.e., threatening health information; Crocker et al., 2008), we suggest that belonging themes should bolster the effects of affirmation interventions in contexts of both social and nonsocial threats. This suggestion is consistent with the findings that activating individuals' social support system (S. Cohen & Wills, 1985; Lakey & Orehek, 2011) or "secure base script" (Waters & Waters, 2006) helps people to constructively cope with stress and distress. Hence, beyond their potential contribution to affirmation theory, our findings also point to the link between affirmation theory and the large body of research on attachment and social support. Linking these literatures offers a fruitful synergy that may inspire future research in both areas and lead to cross fertilization.

Our proposition that self-affirmation interventions are particularly effective in buffering against threats when people write about belonging themes raises the question of whether values-affirmation interventions indeed affirm the self. The finding that people reduce the sense of threat not by looking *inside* themselves (i.e., through reflecting on their inner, personal strengths) but rather by looking *outside* themselves (i.e., through reflecting on their valued social connections) seems, at first glance, to contradict the notion that values-affirmation interventions are indeed affirming the self. Closer scrutiny, however, reveals that social belonging themes are not inconsistent with affirming the self. Specifically, social belonging may be influential due to its capacity to promote a sense of *self-integrity*, that is, "one's sense of adaptive and moral adequacy" (Steele, 1988, p. 263). Because fitting into social groups is an important aspect of human adequacy (e.g., Brewer, 1991; Leary & Baumeister, 2000), reflecting on social belonging-related themes should in principle bolster self-integrity.

In summary, reminding threatened individuals of their meaningful connections with significant others who love and support them may increase their sense that they are efficacious and appropriate people (i.e., bolster their self-integrity), which may in turn protect the self in situations that may

otherwise seem dire. We propose that this fundamental ambiguity between social connectedness and self-integrity may in fact be an important contribution of our work. Sorting out the extent to which heightened social belonging versus heightened self-integrity contributes to affirmation effects is a task that awaits future research. However, we think that at a basic level, the two kinds of motives are fundamentally confounded for a social species like our own.

Another intriguing direction for future research would be exploring whether values-affirmation might exert negative effects under certain circumstances. In the present research, in Study 1, we obtained a significant negative indirect effect of writing about belonging for Whites, in the opposite direction than the effect obtained for Blacks, such that writing about belonging correlated with a drop in GPA for Whites. In Study 2, although not statistically significant, there was a negative trend for men such that conditions inducing more writing about belonging led to poorer performance on the math test. Similar trends have been found in previous research. For example, Miyake and colleagues (2010) found that a values-affirmation intervention that had a positive effect on female students taking a science class, negatively affected one of the performance outcomes for male students.

Why might writing about belongingness be associated with poorer performance for nonstigmatized group members? It is possible that focusing on belonging generally reduce stress (e.g., due to the activation of the social support system). Stress reduction may have positive consequences for stigmatized group members, whose stress level—due to the experience of stereotype threat—is high and hence impairs their performance. However, consistent with the Yerkes–Dodson law, according to which a certain degree of stress or arousal is necessary for optimal performance (Yerkes & Dodson, 1908), stress reduction might decrease nonstigmatized group members' stress below the level that is necessary for optimal performance. An alternative explanation may be offered by the logic of Optimal Distinctiveness Theory (Brewer, 1991), which suggests that group members seek to balance between two opposing motivations: the wish to belong and feel included and the wish to feel distinct and independent. Because stigmatized group members feel potentially excluded in academic settings, affirming their belonging may restore their balance, relieve them from preoccupation with belonging-related concerns, and consequently improve their performance. By contrast, nonstigmatized group members may feel generally balanced in academic settings and the belonging-affirmation might drive them out of their balanced state. For example, reminders of social support may threaten their sense of distinctiveness and independence, which may result in impaired performance. Future research should explore these admittedly speculative possibilities,⁴ which have important implications for both the theoretical understanding and the practical application of values-affirmation interventions.

On a practical level, the present research is the first to offer a specific strategy to improve the existing values-affirmation intervention. Specifically, our findings suggest that structured assignments encouraging members of stigmatized groups to write about social belonging, as was done in the belonging-affirmation condition in Study 2, improve academic performance beyond the improvement commonly found in standard affirmations. The implications of these findings are substantial and timely. Practitioners and policy makers across a variety of domains (e.g., health, education) have increasingly recognized the importance of augmenting structurally based interventions based on social–psychological research (G. L. Cohen et al., 2012). However, scaling such interventions for widespread use requires a thorough understanding of why, how, and when these interventions work (Yeager & Walton, 2011). The present research advances such understanding by highlighting critical content that qualifies values-affirmation effectiveness in buffering against identity threat and by presenting a theory-informed refinement to affirmation exercises with the potential to further improve academic performance.

Acknowledgement

The authors thank Sarah Wert for her assistance with coding the student responses in Study 1. They also thank Nancy Apfel and Allison Master for their assistance with the research in Study 1. Finally the authors express their gratitude to the student participants and, for Study 1, the student participants' parents as well as the teachers and administrators involved in the research.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Support for this research was provided by grants from National Science Foundation (NSF/REESE division Award ID 0723909), Spencer Foundation (Award 200800068), W.T. Grant Foundation, Russell Sage Foundation (Award 87-08-02), and Yale's Institute for Social and Policy Studies.

Notes

1. Six participants who were included in G. L. Cohen, Garcia, Purdie-Vaughns, Apfel, and Brzustoski (2009) sample were not included in the present sample because their writing exercises were missing or lost during the school data collection.
2. Consistent with G. L. Cohen, Garcia, Apfel, and Master (2006; G. L. Cohen et al., 2009), analyses also controlled for seventh-grade teacher team, cohort, preintervention performance (sixth-grade GPA [grade point average] and preintervention seventh-grade GPA), gender (contrast coded: -1 vs. $+1$), and the Gender \times Race and Gender \times Condition interactions.

3. An alternative analytic approach would be to additionally test whether race interacted with condition directly on GPA (i.e., unmediated by belonging). Testing this alternative model (i.e., a Direct Effect and Second Stage Moderation Model; Edwards & Lambert, 2007) revealed that (a) the indirect effect remained significant and (b) both the effects of condition and belonging on GPA-Difference were significantly moderated by race ($ps < .050$). That is, both the path from the experimental condition to GPA-Difference (i.e., the direct effect) and the path from belonging to GPA-Difference significantly interacted with participants' race. These results suggest that the proposed mediation pathway did not account for all the difference in GPA between White and Black students as a function of condition. Nevertheless, consistent with our hypothesis, the indirect effect and the second-stage moderation (i.e., the Belonging \times Race interaction) remained significant when examined at the same time with the moderation of the direct effect (i.e., the Condition \times Race interaction).
4. Another possibility is that qualitative differences between the belonging themes of stigmatized and nonstigmatized participants that were not captured by our coding scheme may have driven the divergent effects. However, additional content analyses that reduced the "belonging themes" into more refined categories did not reveal a sound explanation as to why writing about belonging may have impaired the performance of nonstigmatized group members.

References

- Andersen, S. M., & Chen, S. (2002). The relational self: An interpersonal social-cognitive theory. *Psychological Review, 109*, 619-645.
- Aron, A., Aron, E. N., & Norman, C. (2001). Self-expansion model of motivation and cognition in close relationships and beyond. In M. Clark & G. Fletcher (Eds.), *Blackwell handbook of social psychology: Interpersonal processes* (Vol. 2, pp. 478-501). Oxford, UK: Blackwell.
- Aronson, J., Cohen, G. L., & Nail, P. R. (1999). Self-affirmation theory: An update and appraisal. In E. Harmon-Jones & J. Mills (Eds.), *Cognitive dissonance: Progress on a pivotal theory in social psychology* (pp. 127-147). Washington, DC: American Psychological Association.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497-529.
- Baumeister, R. F., Twenge, J. M., & Nuss, C. K. (2002). Effects of social exclusion on cognitive processes: Anticipated aloneness reduces intelligent thought. *Journal of Personality and Social Psychology, 83*, 817-827.
- Blascovich, J., Spencer, S. J., Quinn, D., & Steele, C. (2001). African Americans and high blood pressure: The role of stereotype threat. *Psychological Science, 12*, 225-229.
- Bowlby, J. (1988). *A secure base: Clinical applications of attachment theory*. London, England: Routledge.
- Brewer, M. B. (1991). The social self: On being the same and different at the same time. *Personality and Social Psychology Bulletin, 17*, 475-482.
- Burson, A., Crocker, J., & Mischkowski, D. (2012). Two types of value-affirmation: Implications for self-control following social exclusion. *Social Psychological and Personality Science*. Advance online publication.
- Cialdini, R. B., Brown, S. L., Lewis, B. P., Luce, C., & Neuberg, S. L. (1997). Reinterpreting the empathy-altruism relationship: When one into one equals oneness. *Journal of Personality and Social Psychology, 73*, 481-494.
- Cohen, G. L., Aronson, J., & Steele, C. M. (2000). When beliefs yield to evidence: Reducing biased evaluation by affirming the self. *Personality and Social Psychology Bulletin, 26*, 1151-1164.
- Cohen, G. L., & Garcia, J. (2005). "I am us": Negative stereotypes as collective threats. *Journal of Personality and Social Psychology, 89*, 566-582.
- Cohen, G. L., & Garcia, J. (2008). Identity, belonging, and achievement: A model, interventions, implications. *Current Directions in Psychological Science, 17*, 365-369.
- Cohen, G. L., Garcia, J., Apfel, N., & Master, A. (2006). Reducing the racial achievement gap: A social-psychological intervention. *Science, 313*, 1307-1310.
- Cohen, G. L., Garcia, J., Purdie-Vaughns, V., Apfel, N., & Brzustoski, P. (2009). Recursive processes in self-affirmation: Intervening to close the minority achievement gap. *Science, 324*, 400-403.
- Cohen, G. L., Purdie-Vaughns, V., & Garcia, J. (2012). An identity threat perspective on intervention. In M. Inzlicht & T. Schmader (Eds.), *Stereotype threat: Theory, process, and application* (pp. 280-296). New York, NY: Oxford University Press.
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*, 310-357.
- Cook, J. E., Purdie-Vaughns, V., Garcia, J., & Cohen, G. L. (2012). Chronic threat and contingent belonging: Protective benefits of values affirmation on identity development. *Journal of Personality and Social Psychology, 102*, 479-496.
- Creswell, J. D., Lam, S., Stanton, A. L., Taylor, S. E., Bower, J. E., & Sherman, D. K. (2007). Does self-affirmation, cognitive processing, or discovery of meaning explain cancer-related health benefits of expressive writing? *Personality and Social Psychology Bulletin, 33*, 238-250.
- Crocker, J., Niiya, Y., & Mischkowski, D. (2008). Why does writing about important values reduce defensiveness? Self-affirmation and the role of positive other-directed feelings. *Psychological Science, 19*, 740-747.
- Cross, S. E., Bacon, P. L., & Morris, M. L. (2000). The relational-interdependent self-construal and relationships. *Journal of Personality and Social Psychology, 78*, 791-808.
- Diehl, M., Owen, S. K., & Youngblade, L. M. (2004). Agency and communion attributes in adults' spontaneous self-representations. *International Journal of Behavioral Development, 28*, 1-15.
- Eccles, J. S., Lord, S., & Midgley, C. (1991). What are we doing to early adolescents? The impact of educational contexts on early adolescents. *American Journal of Education, 99*, 521-542.
- Edwards, J. R., & Lambert, L. S. (2007). Methods for integrating moderation and mediation: A general analytical framework using moderated path analysis. *Psychological Methods, 12*, 1-22.

- Goff, P. A., Steele, C. M., & Davies, P. G. (2008). The space between us: Stereotype threat and distance in interracial contexts. *Journal of Personality and Social Psychology, 94*, 91-107.
- Harris, P. R., & Epton, T. (2010). The impact of self-affirmation on health-related cognition and health behaviour: Issues and prospects. *Social & Personality Psychology Compass, 4*, 439-454.
- Inzlicht, M., McKay, L., & Aronson, J. (2006). Stigma as ego depletion: How being the target of prejudice affects self-control. *Psychological Science, 17*, 262-269.
- Knowles, M. L., Lucas, G. M., Molden, D. C., Gardner, W. L., & Dean, K. K. (2010). There's no substitute for belonging: Self-affirmation following social and nonsocial threats. *Personality and Social Psychology Bulletin, 36*, 173-186.
- Lahey, B., & Orehek, E. (2011). Relational regulation theory: A new approach to explain the link between perceived social support and mental health. *Psychological Review, 118*, 482-495.
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*, 159-174.
- Leary, M. R., & Baumeister, R. F. (2000). The nature and function of self-esteem: Sociometer theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 32, pp. 1-62). San Diego, CA: Academic Press.
- Leary, M. R., & Cox, C. B. (2008). Belongingness motivation: A mainspring of social action. In J. Y. Shah & W. L. Gardner (Eds.), *Handbook of motivation science* (pp. 27-40). New York, NY: Guilford.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98*, 224-253.
- Martens, A., Johns, M., Greenberg, J., & Schimel, J. (2006). Combating stereotype threat: The effect of self-affirmation on women's intellectual performance. *Journal of Experimental Social Psychology, 42*, 236-243.
- McQueen, A., & Klein, W. M. P. (2006). Experimental manipulations of self-affirmation: A systematic review. *Self and Identity, 5*, 289-354.
- Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics, and change*. New York, NY: Guilford.
- Miyake, A., Kost-Smith, L. E., Finkelstein, N. D., Pollock, S. J., Cohen, G. L., & Ito, T. A. (2010). Reducing the gender achievement gap in college science: A classroom study of values affirmation. *Science, 330*, 1234-1237.
- Pohlmann, J. T., & Leitner, D. W. (2003). A comparison of ordinary least squares and logistic regression. *Ohio Journal of Science, 103*, 118-125.
- Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research, 42*, 185-227.
- Schmeichel, B. J., & Vohs, K. (2009). Self-affirmation and self-control: Affirming core values counteracts ego depletion. *Journal of Personality and Social Psychology, 96*, 770-782.
- Shelton, J. N., & Richeson, J. A. (2006). Interracial interactions: A relational approach. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 38, pp. 121-181). San Diego, CA: Elsevier Academic Press.
- Sherman, D. K., Bunyan, D. P., Creswell, J. D., & Jaremka, L. M. (2009). Psychological vulnerability and stress: The effects of self-affirmation on sympathetic nervous system responses to naturalistic stressors. *Health Psychology, 28*, 554-562.
- Sherman, D. K., & Cohen, G. L. (2006). The psychology of self-defense: Self-affirmation theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 38, pp. 183-242). San Diego, CA: Elsevier Academic Press.
- Sherman, D. K., & Hartson, K. A. (2011). Reconciling self-protection with self-improvement: Self-affirmation theory. In M. D. Alicke & C. Sedikides (Eds.), *Handbook of self-enhancement and self-protection* (pp. 128-151). New York, NY: Guilford.
- Smart Richman, L., & Leary, M. R. (2009). Reactions to discrimination, stigmatization, ostracism, and other forms of interpersonal rejection: A multimotive model. *Psychological Review, 116*, 365-383.
- Spencer, S. J., Steele, C. M., & Quinn, D. M. (1999). Stereotype threat and women's math performance. *Journal of Experimental Social Psychology, 35*, 4-28.
- Spencer, S. J., Zanna, M. P., & Fong, G. T. (2005). Establishing a causal chain: Why experiments are often more effective than mediational analyses in examining psychological processes. *Journal of Personality and Social Psychology, 89*, 845-851.
- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 21, pp. 261-302). San Diego, CA: Academic Press.
- Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist, 52*, 613-629.
- Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology, 69*, 797-811.
- Stone, J. (2002). Battling doubt by avoiding practice: The effects of stereotype threat on self-handicapping in White athletes. *Personality and Social Psychology Bulletin, 28*, 1667-1678.
- Stone-Romero, E. F., & Rosopa, P. J. (2008). The relative validity of inferences about mediation as a function of research design characteristics. *Organizational Research Methods, 11*, 326-352.
- Tesser, A. (2000). On the confluence of self-esteem maintenance mechanisms. *Personality and Social Psychology Review, 4*, 290-299.
- Tesser, A. (2001). On the plasticity of self-defense. *Current Directions in Psychological Science, 10*, 66-69.
- Twenge, J. M., Catanese, K. R., & Baumeister, R. F. (2002). Social exclusion causes self-defeating behavior. *Journal of Personality and Social Psychology, 83*, 606-615.
- Wakslak, C. J., & Trope, Y. (2009). Cognitive consequences of affirming the self: The relationship between self-affirmation and object construal. *Journal of Experimental Social Psychology, 45*, 927-932.

- Walton, G. M., & Cohen, G. L. (2007). A question of belonging: Race, social fit, and achievement. *Journal of Personality and Social Psychology, 92*, 82-96.
- Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science, 331*, 1447-1451.
- Walton, G. M., & Spencer, S. J. (2009). Latent ability: Grades and test scores systematically underestimate the intellectual ability of negatively stereotyped students. *Psychological Science, 20*, 1132-1139.
- Waters, H. S., & Waters, E. (2006). The attachment working models concept: Among other things, we build script-like representations of secure base experiences. *Attachment & Human Development, 3*, 185-197.
- Yeager, D. S., & Walton, G. M. (2011). Social-psychological interventions in education. *Review of Educational Research, 81*, 267-301.
- Yerkes, R. M., & Dodson, J. D. (1908). The relation of strength of stimulus to rapidity of habit formation. *Journal of Comparative Neurology and Psychology, 18*, 459-482.