Spring 2012

Cushioning the Impact of Negative Feedback: The Efficacy of Self-Affirmation at Reducing Self-Enhancing Behaviors

Laura Shiley

University of Colorado Boulder

Follow this and additional works at: http://scholar.colorado.edu/honr_theses

Recommended Citation
Cushioning the Impact of Negative Feedback:
The Efficacy of Self-Affirmation at Reducing Self-Enhancing Behaviors
Laura E. Shiley
University of Colorado at Boulder

Akira Miyake
Department of Psychology
Thesis Advisor

Mark Whisman
Department of Psychology
Honors Council and Committee Member

Philip Langer
Department of Education
Committee Member
Abstract

The current study tested: the interaction between self-enhancing behavior following negative feedback and individual differences variables; the effects of self-enhancement on emotion regulation; and how this defensive response can be decreased using a writing-based intervention called *self-affirmation*. To test these ideas, we randomly assigned people to self-affirmation or control conditions, giving them all negative feedback on an IQ test, and then measuring their level of self-enhancing behavior. We measured mood at three points of time in the study: at the beginning, after the negative feedback, and after their opportunity to self-enhance. In our study, we discovered that although people with high WMC bias less and those with low WMC bias more as their negative affect increases, this interaction is eliminated by the act of self-affirmation. In other words, self-affirmation counteracts the ego threat caused by the feedback. Furthermore, when those with high WMC do choose to bias, they experience greater success at emotion regulation as a result of their increased cognitive capacity.
Regardless of one’s profession or lifestyle, no one can avoid negative feedback. This feedback could be in the form of useful criticism or insensitive scorn and could strike when we are working or socializing. Regardless of the format, it is imperative that people understand how to appropriately respond to this feedback, inhibiting typical defense mechanisms like self-enhancing behavior (Schmeichel & Demaree, 2010), self-justifying attitude change, self-serving attributions for success and failure, out-group derogation (Fein & Spencer, 1997), and zealous conviction about one’s beliefs (McGregor et al., 2003; Steele & Liu, 1983).

This study seeks to understand the individual differences in cognitive and personality variables that lead to an increase in self-enhancing behavior following negative feedback, as well as to explore the effectiveness of an intervention called self-affirmation at reducing this behavior so that people can become more open to threatening, but important, information. There are two major hypotheses concerning self-affirmation that we will address in this study: 1.) Self-enhancement hypothesis: Those with higher cognitive abilities should bias more as a byproduct of successful emotion regulation, but this effect should be reduced by self-affirmation, 2.) Emotion regulation hypothesis: People with high working memory capacity (WMC) should experience a smaller decrease in negative affect following the negative feedback due to their innate ability to successfully regulate emotions, but this gap between low and high WMC should decrease in the self-affirmation condition because they are now both using the same method of emotion regulation.

Self-Enhancing Behavior

Past research suggests that when confronted with negative feedback, the desire to view oneself positively often leads people to increase self-enhancing behavior (Koole, 2009). Self-enhancing behavior counteracts a threatening event by increasing how favorably one views
themselves and their abilities, despite the reality of the situation (Baumeister, Heatherton, & Tice, 1993). This form of bias, also referred to as a positive illusion, is the sort of thought process that leads a person in support of capital punishment to favor it more after hearing countering viewpoints (Schmeichel & Vohs, 2009). Others have said that self-enhancement works by defining the constructs at an abstract level (Alicke & Sedikides, 2009). According to this theory, a student who failed a test would declare that this single test does not accurately measure intelligence because it concerns too narrow of a topic. When defining constructs in this abstract way, it is rare to encounter feedback that can break through this defense because the definition can subtly change whenever necessary. These adjustments of one’s views are often so minor—allocating undue weight to positive outcomes that do not measure intelligence or too little weight to highly diagnostic tests—they easily pass by unnoticed.

Although self-enhancing can protect the ego when used in moderation, there are many repercussions to excessive self-enhancement, like greater rates of depression and dropping out of college (for a review, see Lo et al., 2011). One aspect of self-enhancing behavior that has been studied with fervor over the past decade is the biased processing of health information. After reviewing the literature on the subject, Harris and Napper (2005) reported that those who were most affected by the health risk were also the least persuaded to change their lifestyles. A recent study by Armitage, Harris, and Arden (2011) demonstrated that when regular alcohol drinkers were presented with information on the dangers of alcohol, they derogated the message as a means of minimizing anxiety and maintaining their self-esteem (Schmeichel & Vohs, 2009). If they were to accept the threatening health message, their self-esteem would otherwise be degraded because they would be forced to acknowledge that they were behaving in ways that were inconsistent with their goals of being smart individuals, as
evidenced by their ill-informed healthcare. Thus, not only can self-enhancement affect one’s psychological state, it can impact one’s physiological health.

While the tendency to self-enhance clearly has disadvantages outside of the laboratory, it also can bias questionnaires administered by researchers. For this reason, researchers developed many types of scales over the years to sequester this construct so that they can account for the amount of bias that the participant may display throughout the course of an experiment (for a review, see Paulhus et al., 2003). But most measures do not consider that the participant may indeed be telling the truth when they claim to never curse, which is a question that is often used in social desirability scales. To verify just one question would take an in-depth observational study of their behavior and thus researchers just assume that each person curses at least a little, regressing to the mean.

That is why it is important to establish a credible criterion, as is the practice in criterion discrepancy measures, wherein researchers can know with certainty if the participant is telling the truth (Funder & Colvin, 1997). The easiest and most economical way to do so involves creating a test with unambiguous, concrete answers, as is the practice in the Over-Claiming Questionnaire (OCQ; Paulhus, Harms, Bruce, & Lysy, 2003). The OCQ measures a variable called “over-claiming,” which is a key feature of those who self-enhance. See the Methods section for an in-depth explanation of the OCQ’s procedures.

Self-Affirmation

One possible way to reduce self-enhancing behavior is through an intervention called self-affirmation. Self-affirmation can come in many forms, from positive feedback to writing exercises concerning one’s positive characteristics or important values (see overview in Sherman & Cohen, 2006). Regardless of the method, self-affirmation has been shown to decrease out-
group derogation (Fein & Spencer, 1997), increase the implementation of health behavior intentions and changes (Harris & Napper, 2005), and lessen the effect of stereotype threat (Miyake et al., 2010). This is only scratching the surface. Every year, additional studies are published focusing on new areas in which defensive behaviors can be substantially reduced by self-affirmation exercises.

This intervention is based on self-affirmation theory (Steele, 1988), which states that the overall goal of the individual is to maintain the image of the self as someone who is “morally adequate...competent, good, coherent, unitary, stable, capable of free choice, capable of controlling important outcomes, and so on” (p. 262). This theory predicts that, when threatened, people will employ defense mechanisms so as to reach the goals quoted above. But it goes a step further to describe how defensive behavior can be lessened and self-concept restored by affirming an important, but unrelated, source of self-esteem (i.e., attribute) or self-clarity (i.e., value; Klein & Harris, 2009), as is the practice in the self-affirmation intervention.

Self-affirmation has been theorized to work through many mechanisms, like increasing positive affect, positive interpersonal feelings, or ratings of self-concept (Armitage & Rowe, 2011). Koole et al. (2010) proposed that affirmation could work by disengaging people from their current frustrated goals and instead allow them to focus on their extended values, elevating these values as their primary source of self-esteem. Related to this theory, Schmeichel and Vohs (2009) proposed that self-affirmation promotes high levels of mental construal—or, in other words, causes the participant to favor abstract descriptions of events.

Interestingly, increasing one’s level of mental construal and thus viewing the issue in a more abstract way is a similar mechanism by which self-enhancement was proposed to work (Alicke & Sedikides, 2009). Yet the difference between these two methods of attaining high
levels of mental construal is that self-affirmation accomplishes it by boosting *self-control*, the ability to inhibit automatic thoughts, emotions or behaviors, often in order to obtain a greater reward over time (Schmeichel & Vohs, 2009). By reminding people of their abstract goals, people can accept the pain of the present moment in order to work towards a more promising future. This theory makes the most sense out of all the explanations because self-control has been shown to decrease when a person feels threatened (i.e., ego depletion), so by increasing self-control via affirmation, this threat can thereby be offset. Although they may work through similar methods, self-enhancement is a more involved process that requires self-deception and additional cognitive resources to maintain this deception, whereas self-affirmation eliminates the systematic distancing of oneself from negative events in favor of balanced information processing (Alicke & Sedikides, 2011).

Within the contexts of this study, self-affirmation will take the form of a writing exercise prompting the participants to write about why their most esteemed values are important to them (For review of affirmation exercises, see McQueen & Klein, 2006). By recalling these values and times when they have played an important role in their lives, participants will bolster their self-esteem against the negative feedback they all will receive on an intelligence test. This negative feedback was necessary to both induce self-enhancing behavior and to trigger the effects of self-affirmation, which has only been shown to benefit people who currently feel threatened (Pietersma & Dijkstra, 2011).

**Working Memory Capacity (WMC) and Emotion Regulation**

A study by Schmeichel and Demaree (2010) displayed a link between the amount of self-enhancing behavior and the size of working memory capacity (WMC) reserves. Daneman and Carpenter (1980) theorized that WMC is the mechanism that allows for the simultaneous storage
and manipulation of information (for a review of recent theories, see Baddeley, 2006). Since then, psychologists have developed many measures of WMC and most of these tasks involve a memory span task (i.e., reporting the last word in each sentence) that is embedded within a processing task (i.e., reading, performing mental rotation, solving equations, etc.). In Daneman and Carpenter’s original study, they found a correlation between WMC and reading comprehension. Since then, this result has been expanded upon to include correlations with intelligence, processing speed, and reasoning on previous knowledge (Baddeley, 2006).

A series of studies by Schmeichel, Volokhov, and Demaree (2008) demonstrated that WMC is closely related to emotion regulation, which concerns one’s ability to inhibit an emotional response. In their study, individuals with higher WMC more capably suppressed emotional responses while viewing emotionally charged stimuli. The researchers theorized that those with high WMC were more successful at emotion suppression because they had the additional cognitive resources to allocate to the process of emotion regulation. The methods by which one can exercise emotion regulation include: (a) selection of the situation, (b) modification of the situation, (c) deployment of attention, (d) change of cognitions, and (e) modulation of responses (Gross, 1998).

**Schmeichel and Demaree’s Past Research**

We based our current study closely around the methods and premise of past work by Schmeichel and Demaree (2010). They hypothesized that people with high WMC are more skilled at emotion regulation and that they use self-enhancement towards this aim. To test this, they broke their methods up into two days. The first session begun with a popular measure of mood, the Positive and Negative Affectivity Schedule (PANAS; Watson, Clark, & Tellegen, 1988), and concluded with a measure of WMC, the operation span task (OSPA; Turner &
Engle, 1989). On the second day, they introduced their independent variable, which was whether they received negative or no feedback after taking a fabricated test of emotional intelligence, termed the “MacMillian Lifestyles Test.” This test included 20 multiple-choice questions about their socio-emotional preferences like, “Which of these characteristics do you find most important in a friendship? A) Understanding; B) Loyalty; C) Similarity; D) Compassion.” In the feedback condition, some of the output given by the computer included:

Your responses indicate that you lack some of the emotional abilities that contribute to psychological well-being…your responses indicate a tendency to overestimate your own importance… you are likely to experience distress (perhaps even depression) when you encounter failure or other hardships that are inevitable in life. (p. 740)

Those who did not receive feedback simply notified the experimenter of their completion. After this test, they took the Over-Claiming Questionnaire, followed by an additional PANAS. Their results, displayed in Figure 1a, demonstrated that although people with low WMC bias more in the no feedback condition, those with higher WMC engaged in more self-enhancement by claiming greater familiarity with fictitious items on the OCQ when presented with negative feedback. Figure 1b illustrates that whether people with high WMC received negative feedback or no feedback whatsoever, they did not experience a decrease in mood from the first PANAS to the second PANAS administered after the OCQ. Meanwhile, those with low WMC experienced an increase in negative affect as a result of the negative feedback. They reported that these findings demonstrate that people with high WMC are better able to regulate their emotions because they have more cognitive resources to allocate to successful self-enhancement.
Conversely, past research has shown that self-enhancement *increases* when participants are distracted (Paulhus, Graf, & Selst, 1989) or depleted (Vohs, Baumeister, & Ciarocco, 2005)—or, in other words, when cognitive resources are limited. Furthermore, impulsive individuals have been found to over-claim more on difficult trivia questions, most likely because they have lower self-control and lower WMC on average (Nagin & Pogarsky, 2003). These results suggest that high WMC individuals should be less susceptible to overcompensating after an ego threat because they are better able to regulate their emotions automatically, without
utilizing the crude process of self-enhancement (Schmeichel, Volokhov, & Demaree, 2008). Within our replication, we hope to uncover which of these interpretations is best supported by the data—do people with high WMC bias more because they can or do they bias less because they can more successfully use alternative methods of emotion regulation?

**Opposing Theories: Self-Affirmation v. Self-Consistency Theory**

There are two theories that predict the ways in which people respond to negative feedback. The first is the one supported by the results of Schmeichel and Demaree (2010), the *self-affirmation theory*. As discussed earlier, this is the idea that people strive to sustain a positive view of themselves as moral and appropriate individuals (Sherman & Cohen, 2002). Within this viewpoint, when threatened, people wish to increase their self-concept by any means possible in order to return to their baseline self-esteem level. In accordance with this view, everyone should wish to self-enhance but those with higher WMC should be able to do so more and exhibit fewer negative emotions afterwards, because of their greater cognitive ability to regulate emotions.

However, the *self-consistency theory* (Aronson, 1999) argues that dissonance (i.e., self-enhancement) occurs while trying to achieve the goal of consistency and coherence. In this theory, people develop a schema of their own behaviors and abilities early on in their lives so that they can acquire a sense of predictability and control. Once this self-concept has stabilized, they seek out information to confirm this self-schema—distorting reality by ignoring that which disconfirms their self-concept and paying particular attention to that which confirms it. It is for this reason that self-enhancing behavior has also come to be called *verification biases*, because they are most frequently employed when attempting to achieve this consistency and coherence (Oreg & Bayazit, 2009). Thus, because people with high WMC typically excel in school, they
will identify more strongly with being intelligent. Therefore, people with high WMC will self-enhance more than people with low WMC because the negative feedback contrasts more starkly with their self-concepts.

But it is important to keep in mind that this result will only occur in high WMC individuals who care about their intelligence to an average degree. Those who do not care, will not experience inconsistency, while those who value it as one of their most important priorities are more likely to change their behavior in order to become more consistent with the new information (Pietersma & Dijkstra, 2011). This study seeks to distinguish between these opposing theories so as to determine if people bias more due to the self-consistency or self-affirmation theory.

**Current Study**

Because one our study’s purposes was to replicate Schmeichel and Demaree’s study, we modeled our procedures from their design. The main differences between the two studies are that we also included an affirmation exercise, we gave intelligence (rather than emotional) negative feedback to all of our subjects (rather than to just half of them), and we included an additional PANAS immediately following the negative feedback so as to more accurately pinpoint the OCQ’s moderating effect on mood.

In this current study, we will investigate the effects of self-affirming important personal values on decreasing self-enhancing behavior, as well as the effects of individual cognitive and personality differences in moderating the amount of self-enhancing behavior following negative feedback. To do so, we first measure baseline mood and WMC. Then the participant either writes about their personal values (i.e., self-affirmation condition) or their morning routine (i.e., control condition). Next they receive negative feedback. As mentioned earlier, we must give
negative feedback both in order to invoke the defensive response (i.e., self-enhancement) and in order to allow our participants to benefit from self-affirmation, since this intervention has been shown to be useless under non-threatening conditions—it only decreases defensive behavior, it does not increase openness above baseline levels (Schmeichel & Vohs, 2009). Based upon this research, we designed our study so that we threaten a value we presume to be important to all university-level students. This negative feedback will be given in the form of a poor score on an intelligence test (i.e., Raven Progressive Matrices; Raven, 1962). After the intelligence test, participants take another PANAS, following by the Over-Claiming Questionnaire, which will operationalize their self-enhancing behavior by comparing their proportion of hits to the number of false alarms, capped off by a final PANAS (Paulhus et al., 2003).

Over-inflating one’s view of the self makes one vulnerable to being viewed poorly by others and introduces irrationality to one’s understanding of the world. Following Schmeichel and Demaree’s past study, we developed two primary hypotheses. The self-enhancement hypothesis predicts that those with high WMC will bias more and, as a result, experience less negative emotions in response to the negative feedback. But, importantly, bias rates should decrease for everyone following self-affirmation because they will rely on this as their primary method of emotion regulation. The emotion regulation hypothesis predicts that those with high WMC will be less emotionally affected by the negative feedback overall, but that the difference between low and high WMC with high emotional reactivity will be smaller in the self-affirmation condition since they both will be using the same method of emotion regulation, rather than each person using the method that comes most easily and naturally to them. The implied, secondary part of this hypothesis is that people with high WMC generally use a different mode of emotion regulation than those with low WMC. Furthermore, this study will
investigate the relationship between WMC and self-enhancement, shining light onto the moderating variables of this defensive behavior, as well as the other individual differences that facilitate self-enhancing behaviors.

**Methods**

**Participants**

Participants were 61 undergraduate students (36 females and 25 males) at the University of Colorado at Boulder. With the exception of being enrolled in this psychology course, there was no inclusion or exclusion criterion. One additional subject took part in the study but the data could not be used due to an equipment malfunction during the Raven task, which prevented the display of the negative feedback.

**Research Design**

The study was a three-factor between-subjects design, which included the categorical self-affirmation condition (self-affirmation versus control), and two continuous individual difference variables, WMC and emotional reactivity. We randomly assigned participants to either the affirmation or morning routine conditions by subject number before the study began. There were 30 participants in affirmation condition (males=10, females=20) and 31 in morning routine condition (males=8, females=23).

**Negative Feedback**

Twenty-four of the most difficult Advanced Raven Progressive Matrices were chosen for the participant to complete (Raven, 1962). This test presented the participant with a matrix of 3 x 3 patterns, with the block in the bottom right hand corner missing, as displayed in Figure 2. They had to choose the correct answer from a series of eight choices. To emotionally involve the
participant with their performance, we created the pretense that this test was highly correlated with future success by reading the following script to each participant:

> Attempt to solve as many test items as possible in five minutes. After five minutes, the test will end and you will receive your score. This score will be calculated by comparing your accuracy and speed to a sample of 10,000 undergraduate students throughout the nation who took this test as a part of a longitudinal study. This study spanned 10 years and tracked the progress of freshmen through college, and into the professional world. As demonstrated by this longitudinal study, this intelligence test is a good predictor of future success.

![Raven Progressive Matrices Example](image)

*Figure 2. Example from the Raven Progressive Matrices.*

We discouraged them from guessing by claiming that wrong answers would hurt their score. They were only allotted five times to attempt all twenty-four problems because, in our pilot study, no one could complete more than 15 puzzles in that time period. We wanted to place them under the stress so that they were rushed and thus more likely to believe the negative feedback.

After the end of the five minutes, the computer took several seconds to “process the data” and they were all given the same negative feedback, informing them that they had scored at the 27th
percentile, translating this into laymen’s terms as, “This means that, out of a nationwide sample of 10,000 undergraduate students, 73% scored better than you.”

Measures

**Self-Affirmation.** The only manipulated variable within this study was the type of writing activity that participants performed. Participants in the self-affirmation condition chose two or three values from a list (e.g., relationships with friends or family, independence, spiritual values, etc.) that were most important to them. They were prompted to think about times when those values were or would be important to them. At the end of this essay, they wrote the top two reasons why these values were important to them and answered three questions on scale of six-point Likert-scale from *strongly disagree* to *strongly agree* (e.g., “In general, I try to live up to these values”).

Participants in the morning routine (i.e., control) condition were given the same amount of time to write about their morning routine. After this essay, they answered the same number of questions, although the nature of these differed from the affirmation task. For example, they described the top two most time-consuming activities in their morning routine and ranked questions on a six-point Likert-scale like, “In general, I eat breakfast every morning.” People in both conditions were told that this writing exercise should take them 12 to 15 minutes to complete, so as to allow them enough time to answer in full detail.

**Self-Enhancement.** The Over-Claiming Questionnaire (OCQ) is a criterion discrepancy measure, which calculates self-enhancement by having the participants rank their familiarity on a scale of 0 (*never heard of it*) to 6 (*very familiar*) for 150 items across ten categories like, “Physical Sciences” and “Fine Arts” (Paulhus et al., 2003). If the questionnaire only included real items, it would not be possible to tell if one possessed all of the knowledge to which one
claimed. To account for this problem, 30 out of the 150 items (three within each of the ten categories) are fictitious. This scale has been demonstrated to be an effective predictor of both cognitive ability, $\alpha = .73$, and self-enhancement, $\alpha = .72$ (Paulhus, 2003).

This scale calculates two primary measurements, *bias* and *accuracy*. Bias measures how familiar one must be with an item before one claims knowledge of it. It has been shown to correlate with the Narcissistic Personality Inventory, $\beta = .35$, $p < .01$, and Self-Deceptive Enhancement Scale, $\beta = .30$, $p < .01$. Accuracy is one’s ability to correctly claim knowledge of real items while simultaneously not claiming knowledge of non-existent items. Although it may sound similar to bias, Paulhus et al. reported a low correlation, $r = .21$. Paulhus et al. clarified that they could more intuitively be considered *knowledge* (i.e., accuracy) and *confidence* (i.e., bias). To illustrate, an individual can be both biased and accurate if they have thorough knowledge of one category yet still claim to recognize foils. Because the items included on the test are mostly academic in nature, accuracy has been shown to positively correlate with IQ, $\beta = .52$, $p < .01$, and to a lesser degree, so does bias, $\beta = .17$, $p < .05$.

To calculate bias and accuracy, we used signal detection analysis (Swets, 1964). This method groups potential responses into hits (claiming knowledge of existent items), correct rejections (not claiming knowledge of non-existent items), misses (not claiming knowledge of existence items), and false alarms (claiming knowledge of non-existent items). The signal detection analysis method makes use of both hits and false alarms because of the idea that if people over-claim on fake items, they will most likely over-claim on real items as well. We used the simple equation for bias and accuracy outlined by Paulhus et al. and utilized in Schmeichel and Demaree’s study. In order to give more weight to higher scores, this method first calculates the proportion of hits and misses at all possible levels of claiming knowledge on the scale of 0 to
To begin, the baseline for counting a response as a hit is set at 1, so only a 0 can pass as a miss or a correct rejection and anything greater than 1 counts as a hit or a false alarm. This criterion is increased one point at a time until a person must rate the item a 6 in order to make either a hit or a false alarm. Once these proportions of hits (out of a possible 120) and false alarms (out of a possible 30) have been calculated, the two scores are calculated with the following equations:

\[
\text{Bias} = (\text{Proportion of hits}) + (\text{Proportion of false alarms})
\]
\[
\text{Accuracy} = (\text{Proportion of hits}) - (\text{Proportion of false alarms})
\]

Then we averaged all of these individual six scores (from the six different criteria points) in order to calculate the total bias and accuracy that we used for all of the analyses.

**Working Memory Capacity.** After the first PANAS, participants completed the Spatial Span Task to assess their WMC (Shah & Miyake, 1996). The Spatial Span Task presented a capital letter (e.g., F, R, or P) that was rotated and occasionally mirrored-imaged. Participants identified the orientation of the letter by performing mental rotation and responded either “normal” or “mirror” out loud. After each letter, they saw an arrow pointing in one of the eight (cardinal and ordinal) directions. The twelve trials were broken into three blocks which each presented the participant with 2 arrows, 3 arrows, 4 arrows and 5 arrows in a random order. At the end of each trial, they recorded the direction that each arrow was pointing by the order in which the arrow appeared. Their scores were calculated by counting how many arrows they had correct (including both proper order and proper placement) out of a total of 42.

**Emotional Reactivity.** The Positive and Negative Affect Schedule (PANAS) is a measure of mood that contains 20 adjectives total: 10 negative, 6 positive, and 4 neutral (Watson, Clark, & Tellegen, 1988). This questionnaire was administered on three occasions throughout
the course of the study—at the beginning, after the negative feedback, and after the measure of self-enhancement before the participants were debriefed. The order for each of the three tests was randomized prior to the beginning of data collection and the order was permanently set so that each participant encountered the words in the same order. The participant ranked the extent to which they felt each adjective at that precise moment in time on a 101-point scale, ranging from 0 (not at all) to 100 (extremely). The purpose of the PANAS within this experiment was to determine if the participant was affected by the negative feedback and if this damage was ameliorated by their self-enhancing behavior during the Over-Claiming Questionnaire (OCQ).

To analyze mood, we calculated several indices. First, we divided each of the mood measures into one of three categories: negative, positive or neutral. Then we took the average score from each of these categories for all of the three PANAS administrations. To understand how the experimental manipulations affected mood, we took the difference between each of the three administrations. For example, to calculate the effect of the negative feedback on affect, we subtracted the negative mood average in PANAS 1 from that of PANAS 2—higher scores meant higher emotional reactivity, while negative scores meant that their negative affect had actually decreased from the baseline measurement. To calculate the effect of self-enhancement on emotion regulation, we subtracted PANAS 3 from PANAS 2. In this construct, higher scores represented a greater decrease in negative mood as a result of their self-enhancing behavior. The final mood measure asked the question of if negative mood changed over the entire course of the study. This measure subtracted PANAS 3 from PANAS 1 and higher scores implied a greater decrease in negative mood from the beginning to the end of the study. This measure was calculated as a means to replicate Schmeichel and Demaree (2010) because they did not have an
equivalent to our PANAS 2—they only had a PANAS at the beginning of the study (on the first day) and a PANAS after the OCQ (on the second day).

Procedure

Before the experiment, participants were all randomly assigned to either the self-affirmation or the mourning routine (i.e., control) condition. Upon arrival, participants were seated in front of a desk with a Macintosh computer, where they remained for the duration of the study. After giving consent, participants completed a series of questionnaires. The first set of questionnaires contained the PANAS and other measures which were not included in this study. Subjects then completed a measure of WMC, the Spatial Span Task.

At this point, the subjects either performed the self-affirmation or morning routine writing exercise based upon the earlier random assignment. After they completed this task, the participant was given five minutes to take a shortened version of the advanced Raven Progressive Matrices, after which they all received identical negative feedback.

To conclude, they completed another set of questionnaires. This set began with another PANAS, then the Over-Claiming Questionnaire, finished off by another PANAS, in order to detect any differences in mood that the self-enhancing behavior may have induced. Upon completion, the participant was probed for suspicion, debriefed, and thanked for their participation. This experiment took approximately one hour to complete.

Results

Within our study, we had two main hypotheses: 1.) Self-enhancement hypothesis: Bias increases as WMC increases but this trend can be counteracted by affirming important values; 2.) Emotion regulation hypothesis: People with high WMC are more skilled at regulating their emotions following negative feedback, but self-affirmation decrease these WMC group
differences. To test these hypotheses, we have broken our analyses into two main sections, first addressing the self-enhancement hypothesis and then addressing the self-regulation hypothesis.

**Baseline Comparison of Groups**

Before we began the analysis of our data, we verified that the random assignment was successful by analyzing the group means for the measurements taken prior to the experimental manipulation (i.e., writing condition). As displayed in Table 1, there were no significant differences between the two groups.

Table 1. **Baseline measurements to ensure successful random assignment.** WMC is measured on a scale of 0 to 42 and all PANAS scores are measured on a scale of 0 to 100.

<table>
<thead>
<tr>
<th>Affirmation</th>
<th>Morning routine</th>
<th>Mean</th>
<th>SD</th>
<th>Mean</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>WMC</td>
<td></td>
<td>20.3</td>
<td>1.2</td>
<td>22.8</td>
<td>1.2</td>
<td>7.0</td>
<td>36.0</td>
<td>2.1</td>
<td>0.2</td>
</tr>
<tr>
<td>Negative (Baseline)</td>
<td></td>
<td>13.3</td>
<td>2.1</td>
<td>11.3</td>
<td>2.6</td>
<td>0.0</td>
<td>43.4</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Positive (Baseline)</td>
<td></td>
<td>45.1</td>
<td>3.7</td>
<td>40.5</td>
<td>0.4</td>
<td>6.0</td>
<td>85.2</td>
<td>0.7</td>
<td>0.4</td>
</tr>
<tr>
<td>Neutral (Baseline)</td>
<td></td>
<td>47.3</td>
<td>3.7</td>
<td>41.1</td>
<td>3.8</td>
<td>0.0</td>
<td>91.3</td>
<td>1.4</td>
<td>0.3</td>
</tr>
</tbody>
</table>

**Analysis of Self-Enhancement Hypothesis**

As explained earlier, the self-enhancement hypothesis predicts that people with high WMC will self-enhance more but that bias rates will decrease in the self-affirmation condition. To test this hypothesis, we first used bias as our independent variable. To verify that self-enhancement did not affect accuracy rates, as it did not in Schmeichel and Demaree (2010), we included that as our dependent variable in our second analysis.

**Analysis of Bias.** For our main analysis of self-enhancement, we conducted a three-factor between-subjects analysis of variance (ANOVA) to assess the impact of two continuous individual difference variables—emotional reactivity and WMC—and one categorical independent variable—writing exercise condition (i.e., affirmation/morning routine)—on our dependent variable, OCQ bias scores. In this analysis, our measure of emotional reactivity was the difference between the first (baseline) and second (after negative feedback) negative PANAS
scores, which we calculated to account for differences in baseline negative affect, as well as to account for the dependence inherent in measurements from the same participants. Larger emotional reactivity scores indicate a greater increase in negative mood from the 1st to the 2nd PANAS, presumably as a result of the negative feedback.

**Main effects.** Both the main effect of affirmation condition (M_{Affirmation} = .73, M_{MorningRoutine} = .71), F(1,53) = .09, r = .08, p = .77, and emotional reactivity (M_{Affirmation} = .72, M_{MorningRoutine} = .72), F(1,53) = .05, r = .04, p = .83, were not significant. Although the main effect of WMC was significant, F(1,53) = 4.76, r = -.33, p = .04, the trend was not in the expected direction. Instead, as WMC increased, bias decreased (M_{Affirmation} = .64, M_{MorningRoutine} = .81).

**Two-way interactions.** The two-way interaction between WMC and condition, F(1,53) = .01, p = .92, and the two-way interaction between condition and emotional reactivity, F(1,53) = .23, p = .63, both failed to approach significance. But the two-way interaction between emotional reactivity and WMC, shows that as WMC increases, the effect of emotional reactivity on bias decreases, F(1,53) = 5.05, p = .03. In other words, while people with low WMC bias more than people with high WMC on average, this gap is larger for those with high emotional reactivity than it is for those with low emotional reactivity. Although on its own emotional reactivity has little effect on self-enhancing behavior, people with different levels of cognitive ability appear to have different ways of coping with their negative emotions. This two-way interaction, depicted in Figure 3, uses the Aiken and West (1991) method of graphical display and divides the data into ±1 standard deviations, so as to represent continuous variables in a clear way.
Three-way interaction. The main effects and the two-way interaction between WMC, emotional reactivity and affirmation condition were qualified by the effects of a significant three-way interaction, $F(1,53) = 3.31, p = .04$. As depicted in Figure 4, while people in the morning routine condition still either increase (i.e., low WMC) or decrease (i.e., high WMC) as emotional reactivity increases (4a), bias levels for people who have affirmed remain constant regardless of emotional reactivity (4b). To plainly state it, self-affirmation eliminates the effect of emotional reactivity. This interaction demonstrates that although there was no main effect of self-affirmation, the intervention counteracts the influence of strong emotional responses. In other words, while only some people were severely threatened by the content of the negative feedback, self-affirmation eliminated the amount of additional bias triggered by this defensive behavior, thus equating them will people who did not experience the threat to the same extent. Further interpretation of this interaction will be provided in the Discussion section.

Figure 3. Two-way interaction between WMC and emotional reactivity. Even if people with high WMC are largely bothered by the negative feedback, their bias rates do not increase. Meanwhile, more negative mood leads to more bias for those with low WMC.
Figure 4. These graphs depict the three-way interaction between WMC, emotional reactivity, and condition. Although people with high WMC tend to decrease their bias as negative affect increases and those with low WMC tend to increase their bias as negative affect increases, the effects of the affirmation condition counteracts this trend for both low and high WMC.

Analysis of Accuracy. Next we analyzed OCQ accuracy (i.e., ability to discriminate between real and fake items) because we wanted to verify that it was unaffected by self-enhancing behavior, as reported by Schmeichel and Demaree (2010). Although this measure may sound similar to bias, they were uncorrelated, $r = -.10$. We used the same three-factor between-subjects ANOVA structure as before, except that we replaced bias with accuracy as the dependent variable.
Main effects. The main effect of WMC was in the predicted direction, indicating that as WMC increases, accuracy increases, $F(1,53) = 2.73, r = .24, p = .10$, although this effect did not obtain significance. The main effect of condition also was not significant, $F(1,53) = 2.73, r = -.12, p = .10$. The only other marginally significant predictor within the model was emotional reactivity, $F(1,53) = 3.84, r = .22, p = .06$, which demonstrated that as negative affect increased in response to the negative feedback, accuracy also increased.

None of the two or three-way interactions of accuracy approached significance. This analysis demonstrated that the effects of self-affirmation are specific to bias rates.

Analysis of Emotion Regulation Hypothesis

The purpose of both self-enhancing behavior and self-affirmation is emotion regulation. To assess the effect of WMC and bias rates on subsequent mood ratings, we first analyzed the group means for the negative mood scores in all three PANAS administrations (see Table 2) with a mixed design two-factor ANOVA with one between-subjects factor (i.e., affirmation versus morning routine) and one within-subjects factor (three time points of negative mood measurement). Although people in the affirmation condition had consistently higher negative affect than those in the morning routine condition, the main effect of condition was not significant, $F(1,59) = .78, p = .38$.

Table 2. Mood by condition descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>Affirmation</th>
<th>Morning Routine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>PANAS 1</td>
<td>13.34</td>
<td>2.11</td>
</tr>
<tr>
<td>PANAS 2</td>
<td>17.77</td>
<td>2.29</td>
</tr>
<tr>
<td>PANAS 3</td>
<td>12.11</td>
<td>1.87</td>
</tr>
</tbody>
</table>

The main effect of mood was significant, $F(2,58) = 9.15, p < .001$, indicating that there were differences between the three separate measurements of mood. In analyzing this trend of
mood, we discovered that it is quadratic in nature, increasing following the negative feedback and decreasing after the OCQ, $F(1, 59) = 15.95, p < .0001$.

Because we were interested in if people with high versus low WMC individuals achieved different levels of emotion regulation success, we included WMC as a moderator in our analysis. Even though the trends went in the expected directions, as indicated by Figure 5, the results were not significant. Within this graph, people with high WMC experienced less negative affect on average, $F(1, 57) = 3.43, p = .07$, but the two way interaction between condition and WMC did not approach significance, $F(1, 57) = 2.01, p = .16$.

![Figure 5. Quadratic effect of mood. This graph also includes condition (where MR=morning routine and SA=self-affirmation) and depicts the non-significant WMC x condition interaction.](image)

Schmeichel and Demaree reported that those with high WMC had lower negative affect following self-enhancement due to their success at emotion regulation via increased bias rates. To evaluate this claim, we will first replicate their analysis using the difference between the 1st PANAS and the 3rd PANAS as our dependent variable. This variable will show us the participants’ total decrease (or increase) in negative mood from the beginning to the end of the study. The second analysis will focus on the difference between the 2nd PANAS and the 3rd
PANAS, so as to directly view the effects of bias rates on emotion regulation, as operationalized by emotional reactivity.

**PANAS 3 – PANAS 1 analysis.** Within their study, Schmeichel and Demaree did not measure mood directly following the negative feedback (i.e., PANAS 2 in our study), so we will replicate their analysis by comparing the 1st PANAS to the 3rd PANAS, as they did. Schmeichel and Demaree’s primary hypothesis pertained to the two-way interaction in this model between bias and WMC, which predicts that the more people with high WMC bias, the less negative emotion they will experience at the end of the experiment. Because of our interest in self-affirmation, we also wanted to see how condition moderated this two-way interaction between bias and WMC. We conducted a 3-factor between-subjects ANOVA with the between-subjects two-level independent variable of condition, and two continuous individual difference variables, WMC and bias, where the dependent variable was the change in negative affect from the beginning to the end of the study (i.e., PANAS 3 negative affect minus PANAS 1).

**Main effects.** None of the main effects or two-way interactions approached significance. There was no trend of WMC, $F(1,53) = .008, p = .93$, condition was still far from significance, $F(1,53) = .54, p = .47$, and although the main effect of bias was the largest, it was still not significant, $F(1,53) = 1.60, p = .21$.

**Two-way interactions.** None of the two-way interactions were significant. This is important because the original study directly related to the two-way interaction between bias and WMC, $F(1,53) = 1.69, p = .20$. Although this interaction did present a trend that was similar to that which they reported in their 2010 study, it was not significant.

**Three-way interaction.** This three-way interaction showed significant differences between mood across levels WMC and the conditions, $F(1,53) = 4.41, p = .04$. Graph 6a depicts
that in the morning routine condition, there was no significant difference between either high or low WMC participants who biased one standard deviation below average, but that as bias rates increased, negative affect decreased for those with high WMC and increased with those with low WMC. These results partially replicate those found by Schmeichel and Demaree (2010) because those with high WMC were able to use self-enhancement in order to successfully regulate their emotions, whereas those with low WMC who self-enhanced experienced an increase in negative affect. But when self-affirming, higher bias rates led to an increase in negative affect for both groups. Graph 6b depicts this trend and highlights that while self-affirmation was associated with more negative mood when coupled with high rates of bias for both groups, this trend was especially true for those with high WMC.

![Graph 6b](image-url)
Figure 6. Emotion regulation three-way interaction. In charts a and b, a higher score indicates more negative mood in the 3rd PANAS (at the end of the study) than in the 1st PANAS (baseline mood). Negative scores indicate that negative mood has decreased throughout the course of the study. 6a) In the morning routine condition, as bias increased, the positive relationship with WMC increased, leading to a greater reduction in negative affect for those with high WMC. 6b) After affirming important values, the interaction was no longer significant, leading both groups (high and low WMC) to be the same regardless of the extent to which they biased.

It is worthwhile to emphasize that the gap in change in negative affect is much smaller between the low and high WMC within the self-affirmation condition than it is within the morning routine condition. To analyze these gaps, we developed two 2-factor ANOVAs with two continuous individual difference variables, WMC and bias, where the dependent variable was the change in negative affect from the beginning to the end of the study. The first ANOVA only examined data from the morning routine condition and it reported a significant WMC by bias interaction, $F(1, 27) = 9.40, p = .005$, which validated our prediction that there is a significant difference between those with low and high WMC and high levels of bias. The second ANOVA only examined data from the self-affirmation condition and it verified that the gap between these two groups was no longer significant, $F(1,27) = .22, p = .64$.

**PANAS 2 – PANAS 3 analysis.** We made use of our additional PANAS measurement taken after the negative feedback and directly preceding the OCQ, so as to determine if over-
claiming moderated the effect of a decrease in negative mood, or if the affirmation prior to the negative feedback (or automatic emotion regulation for the morning routine condition) was more responsible. By subtracting the negative affect values of the 3rd PANAS from those of the 2nd PANAS, we computed a dependent variable that specifically examined the effect of the OCQ on mood. A higher value indicated a greater decrease in negative affect as a result of over-claiming. The ANOVA design for this analysis was the same as for the PANAS 3 – PANAS 1 analysis, except that the dependent variable was now the difference between PANAS 2 and 3.

**Main effects.** As was the case in the last analysis, there were no main effects of WMC, $F(1,53) = .08, p = .78$, rates of bias, $F(1,53) = 1.93, p = .17$, or condition, $F(1,53) = .0004, p = .98$.

**Two-way interactions.** There were no significant two-way interactions. In fact, the interaction between WMC and bias—Schmeichel and Demaree’s interaction of interest—was less significant than in the last analysis, $F(1,53) = .004, p = .95$.

**Three-way interaction.** The three-way interaction also was no longer significant, $F(1,53) = 1.49, p = .23$. This decrease in significance indicates that the effects of mood regulation do not appear to be linked to the bias ratings on the Over-Claiming Questionnaire—they instead occurred immediately (i.e., prior to the 2nd PANAS), without the use of self-enhancement. This suggests that the results found in Schmeichel and Demaree may also have differed if they had measured mood at this point in the study, rather than assuming that bias is the only factor that moderates mood.

**Discussion**

To recapitulate, the primary hypotheses of this study were: 1.) When within the morning routine condition, the higher the WMC, the greater the over-claiming. But self-affirmation should reduce self-enhancing behavior because it gives the participant an easier method by
which to regulate emotions, 2.) Emotion regulation following negative feedback is moderated by WMC. Those with higher WMC experience less negative affect overall but this gap is lessened when in the self-affirmation condition because low and high WMC individuals were more likely to use the same emotion regulation method. We will address each one of these hypotheses, their results and implications in turn.

**Self-Enhancement**

The hypothesis that self-affirmation decreases the amount of self-enhancing behavior was partially supported. It was only partially supported because, as a result of the main three-way interaction between the writing exercise conditions, WMC, and emotional reactivity, only some groups of participants experienced this decrease. Without self-affirmation, participants biased more (i.e., low WMC) or less (i.e., high WMC) as emotional reactivity increased. Self-affirmation eliminated the effect of emotional reactivity, which meant that while those with low WMC exhibited a decrease in bias, those with high WMC actually exhibited a slight increase in bias compared to their emotionally reactive counterparts in the morning routine condition.

While our hypothesis (as it was worded) was only partially supported, we can see that although the amount of self-enhancing behavior may have increased for some people as a result of self-affirmation, the total amount of defensive behavior still decreased overall. How is this possible? This is because before we assumed that all people over-claim when they are threatened. But the self-consistency model posits that if people value an attribute highly and it is threatened, they may actually change their views of themselves to fit with the new information, or be more likely to act in the direction of the negative feedback. That could be the trend that we observed in our data with high WMC biasing less after the negative feedback when in the morning routine condition, because they accepted the information as true and sought to be more
accurate in the future. Self-affirmation thus affected this group by boosting self-esteem and eliminating the need for this sort of self-degrading behavior.

Whereas the self-consistency theory allows people to feel humbled in the case of failure, the self-affirmation theory assumes that people will need to find a way to bolster their self-esteem to counteract every threat. This is exactly the sort of impact we observed upon people with low WMC who did not self-affirm. As their negative affect increased, they biased more as a means of creating a more positive image of themselves. When in the affirmation condition, it was not necessary to bias to the same extent because they already held a positive view of themselves, despite the negative feedback.

As you can see, both theories (i.e., self-consistency and self-affirmation) play a clear role in the interpretation of our three-way interaction. While self-affirmation theory explains the self-enhancing tendencies of those with low WMC in the morning routine condition and high WMC in the affirmation condition, the self-consistency theory explains the degrading tendencies of those with high WMC and high emotional reactivity in the morning routine condition. Most importantly, affirming important values makes it less necessary to follow either method, because they have already been buffered against the threat with a less complicated cognitive process.

**Emotion Regulation**

Our study was largely based off of Schmeichel and Demaree’s two primary hypotheses: 1.) People with high WMC will experience a smaller increase in emotional reactivity over all, 2.) The difference between low and high WMC with high emotional reactivity will be smaller in the self-affirmation condition. Our results did not fully support either of these claims. Before we begin with the emotion regulation hypothesis, the main effect of WMC in our primary analysis of bias demonstrated that people with high WMC biased *less* on average, which did not support the
finding upon which they based their results—that people with high WMC biased the most. Our finding instead supports the alternative hypothesis proposed earlier in this paper, that self-enhancement is a method predominately used by those with limited cognitive resources; whether due to low WMC, ego depletion, distraction, or impulsivity.

Our first analysis that focused on emotion regulation replicated their analysis by testing the total change in negative mood from the beginning to the end of the study. The three-way interaction between WMC, affirmation condition, and bias in Figure 6 indicated that when in the morning routine condition, as WMC and bias rates increased, negative affect decreased. This result supports the findings of Schmeichel and Demaree (2010) because it shows that people with high WMC were able to use self-enhancing behavior in order to effectively regulate their emotions.

Although the following does not apply to the replication, it is important to note that after affirming important values, people with high WMC and high bias experienced an overall increase in negative mood. Not only was biasing not useful to people with high WMC but, in this case, it was detrimental. This may be because those who biased despite having already affirmed their values have another personality variable (i.e., narcissism) that makes their self-concept more fragile than usual. While emotion regulation seems to have been less successful for the high WMC people who self-affirmed, at least the gap between low and high WMC people with high emotional reactivity closed to non-significance. Clearly, both groups were just as successful at emotion regulation when using self-affirmation as their primary means of alleviating their emotional distress.

One limitation of this successful replication is that this analysis discounts the change in mood that could have been caused by various other components of the study—or, in the case of
Schmeichel and Demaree, the change in mood that people are likely to experience from the day of the first session to the day of the second session. To account for this possible source of error, we examined an additional measurement of affect immediately following the negative feedback (i.e., PANAS 2), and calculated the difference between it and the measurement immediately following their opportunity to self-enhance in the OCQ (i.e., PANAS 3). With this additional PANAS measurement, we demonstrated that the significant effect from the replication analysis disappears, raising a question concerning the nature of the relationship between biasing and emotion regulation as presented in past research. These results suggest that emotion regulation in this context is not an effortful process facilitated by self-enhancement, but instead is an automatic process that does not need to be facilitated by coping techniques in order to be successful.

Clearly, people with high WMC use methods of implicit emotion regulation more successfully and with more frequency in the morning routine condition than those with low WMC. But what implicit methods do they utilize? Nail, Misa and Davis (2004) suggested a plethora of psychological resources that someone can turn to when they have to deal with dissonance, including implicit self-esteem, self-serving attributions, positive affect, and automatic interpretive biases. The only method that we can address with our data is positive affect, and although we can agree that although high WMC individuals do seem to exhibit more positive affect on average, this positive affect tells us little about their cognitive processes that facilitated it.

**Limitations**

The main concern that arose while conducting this study was the absence of a true control condition, as used within Schmeichel and Demaree’s study. A true control condition would have
allowed us to see if we were observing self-enhancing behavior in response to the threatening situation or if we were simply observing personality traits. For example, people low in WMC may not have been offended by the feedback—they may instead just always bias more, which is a personality trait that has been correlated with narcissism (Paulhus, 2003).

A limitation that was within both this study and Schmeichel and Demarree’s study is the reliability of the simple accuracy and bias measurements. The problem is that these two calculations do not appear to measure the constructs that they claim to. Bias is supposed to measure a person’s over-claiming but the score groups together hits and the false alarms, assigning equal weight to them both. This method does not differentiate between real knowledge and over-claiming. In fact, someone with no hits and all false alarms would receive the same score as someone with all hits and no false alarms. Although accuracy is supposed to measure the individual’s ability to discriminate between correct and incorrect responses, it disregards the theory that it was based on (i.e., if someone over-claims on false items, then they must also over-claim on true items) and assumes that all of the hits are based on true knowledge. In other words, simply because the participant claimed knowledge of a real item does not mean they have any knowledge of it. In this case, claiming familiarity with this real item would be no better than making a false alarm, except no penalties are allocated—does this make them accurate or just lucky? Macmillan and Creelman (2005) suggest other methods of calculating this score, like criterion location (i.e., c) in place of bias and d prime in place of accuracy.

One problem with measuring both affect and defensive behaviors is that the two things are often not independent. In fact, people who are more motivated to sustain their positive affect may be the most likely to use defensive behaviors (Ferrer et al., 2011). If this were the case, we would have mislabeled defensive behaviors as successful emotion regulation. These constructs
can be difficult to properly identify, thus why it is recommended to use additional means of measuring the same construct to verify one’s results, as well as to include other personality measurements (i.e., narcissism, self-esteem, etc.) as covariates.

As with all small studies in the university setting, we did not have a true randomized sample. Everyone within our sample was a traditional undergraduate student at the university. Furthermore, our sample was also small for a study of individual differences, especially compared to Schmeichel and Demaree’s study (n = 102). As a result of our small size, we did not obtain a large amount of variability in our measurement of negative affect. This small variability means that our study has relatively little power and thus, because of these reasons, our trends cannot be applied to outside populations.

Future Directions

There are many more variables that have been demonstrated to correlate with self-enhancement (like narcissism, explanatory style and self-esteem) that our study did not take into consideration. In the future, it would be useful to investigate how these variables may moderate the effectiveness of affirmation and how they may contribute to creating more accurate models of self-enhancing behavior.

One particularly important individual difference variable to include in the future is explanatory style. Inclusion of this trait would account for differences in coping strategies—optimistic individuals employ approach coping strategies to eliminate, reduce, or manage stress, whereas pessimistic individuals employ avoidance coping strategies to ignore, avoid, or withdraw from stress (Solberg Nes & Segerstrom, 2006). By identifying these groups, future research will cease collapsing across styles of attribution and begin recognizing old error to be important individual difference characteristics.
To emphasize the importance of studying narcissism in the context of self-enhancing behavior, Paulhus et al. originally developed the Over-Claiming Questionnaire with the purpose of identifying those who over-claim, not in response to threat, but instead those who over-claim chronically (e.g., people with narcissistic personality traits). Because affirmation did not decrease the overall bias levels, our results suggest that the participants within our study over-claimed not as a result of the threat, but instead primarily because of their personality traits. In future research, it would be important to have a true control group who receives no feedback so that we can assess the baseline level of over-claiming and therefore observe if the participants have successfully eliminated the threat through the process of self-affirmation. Furthermore, since past research has shown that narcissists are less likely to view criticism as credible than they are to view compliments, identifying narcissistic personality traits could help us to predict if the person believed our negative feedback, which is always a struggle when conducting research with elements of deception (Shrauger, 1988; Taylor, 1991).

The discrepancy between this study and Schmeichel and Demaree’s original study raises the question of if the type of feedback mattered. In our study, we insulted one area and then gave them an opportunity to redeem themselves in the same area. But within Schmeichel and Demaree’s, the threat was in an area that was no longer relevant. Future studies should investigate if people deploy different emotion regulation techniques based upon the category of the threat, as well as the extent to which they identify with that area.

**Implications**

Self-affirmation as an intervention is rapidly gaining ground in areas of research as diverse as prejudice (Fein & Spencer, 1997), medicine (Harris & Napper, 2005), and education (Miyake et al., 2010). As mentioned earlier, it imbues its users with an increased ability to
tolerate ambiguity, which is related to a variety of positive outcomes, such as decreased depression, effective emotion regulation, and general positive health (Feldman Barrett, Tugade & Engle). Effective emotion regulation is a desirable skill because it has been linked to such important goals such as improved mental health, physical health, relationship satisfaction, and work performance (Koole, 2009). In fact, chronic deficits in emotion regulation have been linked to all major forms of psychopathology. For these reasons, the data here suggests that it would be a useful tool to include in various therapy programs, so as to help with the control and development of emotion regulation. Further research should be conducted to investigate how the effects of self-affirmation can add up over time, in order to understand how to best implement this invention in therapy programs and/or workshops.

**Conclusion**

To a degree, self-enhancement can be used constructively as a form of emotion-regulation, and psychologist Otto Rank argued in 1936, “To be able to live one needs illusions, not only outer illusions … but inner illusions [i.e., a secure sense of one’s active powers… ]” (p. 251-252). Rank creates a picture of this type of mild self-enhancement as something necessary to avoid a fate of nihilism. But in excess, self-enhancement can have negative consequences on relationships, work and emotional wellbeing. Although our study did not discover a panacea for reducing self-enhancing behavior across all categories, we can successfully counteract the increase in defensive behaviors caused by threatening events with a simple ten-minute writing exercise.

As humans, we have the ability to reflect upon the world around us, as well as the thoughts within our own minds. By doing so, we are able to pass judgment on our thoughts and emotions prior to performing an action, allowing us to inhibit our initial response in favor of a
less drastic course of action. When threatened, this thought process becomes cluttered with emotions, disabling one from exerting the same sort of self-control. Self-affirmation counters these effects by reminding us of that which makes us human—our values and the ability to forego pleasure in the present in favor of greater returns in the future. With our values in mind, emotion regulation becomes easier and defensive self-enhancing behavior becomes less appealing.
References


