Running Head: SELF-AFFIRMATION AND PERFORMANCE

Improving Performance on a Creativity Task via Self-Affirmation

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Abstract

Previous research has suggested that writing about an important person value, compared to writing about a value that is not important, can reduce defensive responding to threats to self, decrease ruminative behavior, and improve academic performance. The current study tests the effects of self-affirmation on a laboratory-based performance intelligence task in college students (N=51). After engaging in the writing task, participants were given the "intelligence test" (a Remote Associates Task) from a trained evaluator under time pressure and negative social evaluation. They were given failure feedback telling them they were below average among their peers. Following the test, participants filled out questionnaires to assess their acceptance of the news article (which described the RAT as a good predictor intelligence and one's future success), how negatively they perceived the trained intelligence test evaluator, and rumination. Findings indicate that performing this self-affirmation writing activity can improve performance on the RAT. There were no effects of self-affirmation on defensiveness and rumination, and work is currently exploring the mechanisms of the self-affirmation and improved performance link in this study. The present study provides the first laboratory evidence for a performance effect of self-affirmation and provides opportunities to explore how self-affirmation improves academic performance in student populations.

Introduction

A large literature shows that self-affirmation is effective in buffering a variety of self-threats such as during stress, stereotyping, and in receiving negative health messages (for a review, see Sherman & Cohen, 2006). More recently, two studies suggest that self-affirmation may also improve academic performance in stereotype-threatened students (Cohen, Garcia, Apfel, & Master, 2006; Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009). However, very little work has explored the underlying mechanisms of self-affirmation, and specifically how self-affirmation influences academic performance. The present study tests the effects of self-affirmation on academic performance in a controlled laboratory setting, and the pathways linking self-affirmation with academic performance.

Self-affirmation theory (Steele, 1988) posits four basic tenets. First, people want to perceive themselves as being of worth. Second, because people are motivated to maintain and improve self-integrity, they may be more defensive to messages that threaten this self-worth. Third, this system is of global focus. Therefore, strengthening self-worth in one area has an effect on the global conception of self-integrity. Lastly, to affirm one's integrity, people can engage in activities that remind them of important aspects of their character and life. Some studies have shown that writing about an important value and why it is important to one's life (i.e., self-affirmation) can increase positive views of the self (Sherman & Cohen, 2006). Humans are motivated to see themselves in a positive way (Steele, 1988; Sherman & Cohen, 2006). Something that challenges this positive view, or challenges an individual's identity, may be seen as threatening and can often lead to impaired performance in a number of domains, including academic performance (Steele & Aronson, 1995). Self-affirmation may protect global self-

integrity in ways that allow people to perform better in self-threatening contexts, by reducing defensiveness, stress responding and rumination.

Cohen and colleagues have conducted several field studies exploring the effects of self-affirmation on academic performance in middle school students (Cohen, et al., 2006; Cohen, et al., 2009). African-American seventh grade students who wrote about an important value improved their Grade Point Average (GPA) by 0.30 over the fall semester (Cohen, et al., 2006). This effect was not isolated to the targeted class (the class in which the student performed the self-affirmation writing activity). Rather, they found performance benefits across all of the student's courses. In addition, a follow-up study found that, two years later, the affirmed African American students had raised their GPA by 0.24 points. Underperforming students benefitted most, raising their GPA by 0.41 points over those two years (Cohen, et al., 2009).

The Caucasian students in this study did not have similar performance benefits. This suggests that the African American students felt the greatest threat to their self-image in school. This is supported by the fact that the lowest performing students saw the greatest improvement. However, there have been no laboratory studies that have supported the effects of self-affirmation on performance. The present study aims to evaluate this effect and replicate it in a sham intelligence test setting. In addition, the study investigates a few potential mechanisms for this effect, including reduced rumination and reduced defensiveness.

Self-affirmation has profound effects upon thoughts and perceptions, specifically related to defensive responding. Koole, Smeets, van Knippenberg and Dijksterhuis (1999) found that self-affirmation reduced rumination after a failed attempt at achieving a goal. In this study, the participants took an alleged IQ test, and were given negative feedback. However, if participants had affirmed a personal value, they were less likely to ruminate, as measured by an implicit

measure of rumination. Rumination is not considered to be under the individual's conscious control. However, this thought pattern is not always beneficial and can interfere with one's performance (Brunstein & Gollwitzer, 1996). Thus, the present study is interested in self-affirmation's effects on ruminative thought following a task in which participants receive failure feedback.

Health psychologists have also taken an interest in self-affirmation and its potential benefits for increasing acceptance of self-threatening health messages. It is often true that these messages are threatening, and people interpret the articles in a self-preserving manner so as not to feel at risk (Weinstein & Klein, 1995). Sherman, Nelson and Steele (2000) found that when a message is of high-relevance to participants, they rejected the message more. However, when participants affirmed an important personal value, they were more accepting of the message and planned to change their behavior accordingly. The authors suggest that the greater the message's threat to the individuals self-image, the greater the effect self-affirmation can have on the person's acceptance of this information. Crocker, Niiya & Mischkowski (2008) found a similar effect for acceptance of a threatening health message. The self-affirmation effect in this study was mediated by feelings of social connectedness and love. They suggest that people may be transcending the self in self-affirmation and this reduces the defensive response to the health message. However, this effect has not been studied in a performance task study. Most of the results have been found using health messages to threaten an individual's sense of self. The present study will test these effects in a performance domain to see if self-affirmation reduces defensiveness, and if this is a potential mediator for the effect of self-affirmation on academic performance.

In this study, college students were randomly assigned to one of two study groups: those who wrote about an important personal value (self-affirmation condition) and those who wrote about a value that was not important to them (control condition). All participants took an alleged intelligence test, and received feedback that their performance was below average among their peers. Their ruminative thoughts, acceptance of an article that detailed research on the intelligence test, and their perceptions of their test administrator (evaluator) were assessed. We hypothesize that those in the self-affirmation condition would receive better scores on the intelligence test compared to those in the control condition. Those who write about an important personal value will ruminate less about their performance than those in the control condition. In addition, it was hypothesized that participants would be less defensive and therefore more accepting of the article about the intelligence test and perceive their evaluator less negatively if they have affirmed an important personal value.

Overview of the Study

After providing consent, participants were given the instructions for the experiment. They were given the instructions for the intelligence task, and told that a trained evaluator would be administering the test to them. They were given a fictitious news article that summarized research on the test they were about to take, and how well it predicted future success. While the evaluator ostensibly prepared for the testing session, participants were given a values affirmation packet, and were asked to rank 11 items. Participants in the self-affirmation condition wrote about their first ranked value and why it is important to them, while the control participants wrote about their ninth ranked value and why it might be important to someone else. Following this task, the evaluator gave them the intelligence test under time pressure, which consisted of 30 very difficult remote associate items (RAT citation). Following the 30 trials, the evaluator

prepared a score report and told participants their score and that they were in the 28th percentile, which was as 'below average' among their peers. Following a five-minute recovery and rumination period, participants filled out questionnaires to assess their acceptance of the news article (which described the RAT as a good predictor intelligence and one's future success), how negatively they perceived the trained intelligence test evaluator, and rumination.

Methods

Participants & Design

54 students (27 females) from Carnegie Mellon and the University of Pittsburgh participated for course credit or $20. Participants ranged in age from 18 to 29, with an average age of 20.74 (SD=2.01). The majority of the sample was Caucasian (56%), followed by Asian-American (20%), African-American (9%), mixed-race (7%), and other (7%). Participants were screened and excluded from the study if they had any health conditions (including asthma, hypertension or mental health issues) or took prescription medications that may affect cortisol levels (i.e. oral contraceptives). The present sample was highly academically identified, and thus the intelligence test threatened core aspects of their identity. Participants rated how important performance in school was to them on a 5-point scale (1=not very important, 5=very important). The mean rating was 4.46 (SD=.51). More than 93% of the sample chose 4 or 5. Two participants were excluded from data analyses who were not academically identified (rating this item as 1 or 2), and one participant was excluded because they did not complete the study tasks, and thus the final analyses consisted of 51 participants.

The present study was a 2(self-affirmation vs. control) X 7(time: baseline, test instructions, self-affirmation writing activity, performance task, score sheet printout, score delivery and rumination) mixed design, with self-affirmation as the between subjects variable

and stress physiology as a repeated measures variable. The current report will focus on the effects of the self-affirmation manipulation only, and thus the study is a one-way, two-groups design. Physiological data (including measures of cortisol, Heart Rate Variability, Cardiac Impedance measures and Galvanic Skin Conductance) will not be described in this report, but the processing of this data is currently underway.

Procedure

After providing consent for the study, participants were told about the procedure of the experiment, explaining that they would be taking an intelligence test and then answering a few questions following this test. An experimenter provided the instructions for the performance test, which was called the "Remote Associates Task". The use of this task was modeled after lab stress tasks designed to elicit social evaluative threat, like the Trier Social Stress Task (Kirschbaum et al., 1993). Participants were then given a fictitious news article citing research on the Remote Associates Task (RAT) and its relationship to IQ. This research said that the task was a better predictor of career success than the Intelligence Quotient test, and was a more accurate measure of intelligence. To ensure that participants fully read the article, participants completed several questions about the content of the article. Participants were informed that a trained evaluator would administer the test to them.

Prior to completing the performance task and while the evaluator was ostensibly "preparing to administer the test," participants were asked if they would be willing to complete a questionnaire and writing activity for another experiment. Participants were randomly assigned either to the value-affirmation condition or to the control condition. They rated 11 values in order of importance to them. Next, they wrote about their first ranked value and why it was important to them (in the self-affirmation condition), or their ninth ranked value and why it might be

important to others (in the control condition) (based on self-affirmation intervention used in Cohen, et al., 2006). Then participants were asked to write two reasons why this value might be important to them and rate how important it is to their life (self-affirmation condition) or to a University of Pittsburgh or Carnegie Mellon student and how important it is to other students' lives (control condition). The experimenter remained blind to participant condition during the entire laboratory session.

The evaluator then entered, wearing a lab coat and carrying a clipboard. The participants were shown the three words on a computer screen and had twelve seconds to provide their answer verbally to the evaluator who would provide correct and incorrect feedback. The Remote Associates Task test we used contained 30 trials. The questions we used were adapted from Bowden and Beeman (2003), which contained normative data for 144 trials. We chose a set of questions with variety of difficulties. We chose 17 difficult problems (less than 20% of participants could solve in 30 seconds), 10 medium difficulty problems (less than 50% of participants could solve in 30 seconds) and 3 easy problems (greater than 60% of participants could solve in 30 seconds) (Bowden & Beeman, 2003). In the RAT task, they are given three words and asked to find a fourth word that is associated with all three. They are given 12 seconds to provide their answer verbally to the evaluator, who gives them "correct" or "incorrect" feedback. Throughout the testing session, the evaluator maintained a cold demeanor and said one of five non-accepting phrases every eight to ten trials (i.e. "I need you to try harder," or "Remember, this is a test of your intelligence.") Following the 30 trials, the evaluator prepared a score report for the participant, with number correct out of 30. To induce defensive responding, the evaluator informed the participant that they placed in the 28th percentile, which was "below average" among their peers.

After a five-minute recovery and rumination period, the experimenter returned and gave the participant a number of questionnaires measuring defensiveness towards the intelligence test and defensiveness towards the evaluator, as well as state rumination. After completing these questionnaires, participants were debriefed, compensated, and excused.

Measures

Demographic information including age, gender, education, and ethnicity were collected at baseline. In addition, a question addressing how important school performance was to the participant was asked, and participants answered on a 7-point Likert Scale (1=Strongly Disagree, 7=Strongly Agree). This question was used as an exclusion criterion for those participants who do not identify themselves as being highly academic (answers of 1 and 2 were excluded).

Following Sherman et al. (2000) and Crocker et al. (2008), defensiveness was measured with a questionnaire assessing participants' acceptance of the intelligence test article that they had read prior to taking the intelligence test. This questionnaire contained questions such as "I think the intelligence task is accurate in predicting future ability to get a job/attend graduate or professional school," and "I found the contents of the intelligence test to be relevant to me". The participants answered on a 7-point Likert scale, 1 being "Strongly Disagree" and 7 "Strongly Agree." One item ("I am concerned the article misrepresented the intelligence test as a true test of one's intelligence") was reversed scored. A composite measure of article acceptance was calculated by summing the items (study α=.78).

We measured participant attitudes towards the intelligence test evaluator. Participants were asked to rate their evaluator on a number of traits including, "sympathetic," "sloppy," "selfish" and "competent" on a 7-point Likert scale (1=Strongly Disagree and 7=Strongly

Agree"). All of the positive traits were reversed scored. A composite measure of negative perceptions of the evaluator was calculated (α=.91).

Following Koole, Smeets, van Knippenberg and Dijksterhuis (1999), state rumination was measured with a questionnaire assessing how much the participant thought about the test and their performance. The questionnaire included questions such as "I thought about my intelligence test performance a lot in the last couple of minutes," and "I thought about my intelligence test score a lot in the last couple of minutes." Participants used a 7-point Likert scale to rate how much they agreed with each of the 5 statements. A composite measure of rumination was calculated (α=.95).

Results

We predicted that those individuals who affirmed a value that was important to them would perform better on the performance task, as determined by the total number of correct responses on the RAT trials. To test this hypothesis, we conducted a univariate Analysis of Variance (ANOVA), with participant condition (Self-Affirmation, control) as the independent variable. Consistent with this prediction, we found a main effect for self-affirmation condition, ($F(1, 48)=4.42$, $p=.041$, $\eta^2= 0.083$), which indicated that affirmed participants performed better on the RAT task (M=9.20, SD=3.28) compared to the control participants (M=7.31, SD=3.15) (see Figure 1).

One possibility is that these performance effects may have been driven by gender differences and self-affirmation reducing stereotype threat responding (Cohen, et al., 2006). To test this, we conducted a 2 (self-affirmation vs. control) X 2 (gender: male vs. female) ANOVA to determine if there was an interaction between gender and self-affirmation condition on RAT performance. We did not find a main effect of gender on RAT performance, with males

(*M*=7.77, *SD*=3.95) and females (*M*=8.72, *SD*=2.49) performing equally on the RAT task, (*F*(1, 47)=0.36, *p*=0.550, η^2=0.008). The self-affirmation by gender interaction was also not significant, (*F*(1, 47)=0.92, *p*=0.342, η^2=0.019). These findings indicate that there were no differences between males and females on RAT performance, and gender did not moderate the self-affirmation effects on performance.

We predicted that those individuals in the self-affirmation condition would be more accepting of the article describing the RAT as a valid indicator of intelligence. To test this hypothesis, we conducted a univariate ANOVA, again with the condition (self-affirmation, control) as the independent variable. Contrary to this prediction, we did not find a main effect for self-affirmation condition, (*F*(1, 48)=.026, *p*=0.87, η^2=.01). Participants who affirm an important value showed no difference in article acceptance compared to control condition participants.

Our third prediction was that the self-affirmation condition would cause individuals to perceive their evaluator (the test administrator) less negatively than those in the control condition. We performed another univariate ANOVA to test this hypothesis, using self-affirmation condition as the independent variable. We did not find a main effect for perceptions of their evaluator, (*F*(1, 48)=0.638, *p*=0.428, η^2=0.013). The participants in the two different conditions do not seem to perceive their evaluator differently.

Our fourth prediction was that those who affirmed an important value would ruminate less about the intelligence test and their score on this test. We performed a univariate ANOVA to test this hypothesis, using condition as the independent variable. We did not find a main effect for rumination, (*F*(1,48)=1.12, *p*=.294, η^2=.023). The participants in the self-affirmation condition did not ruminate less than the control participants.

Discussion

In the present study, we observed that people who affirm an important personal value by engaging in a short writing task receive higher scores on an academic performance test. This suggests that self-affirmation may be able to improve performance on certain tasks. This finding is consistent with the results from the Cohen et al. (2006, 2009) which showed academic performance improvements in academically threatened African-American middle school students. This effect was not seen in their Caucasian peers who had done the values affirmation writing task. Our sample was highly motivated to do well on the intelligence test because academic performance is very important to them. Thus, it may be that our sample would feel a threat to their self-identity by a task that tests them in this domain. Those in the self-affirmation condition may have felt less of a threat to their global self-conception, and would perform better on the task, similar to the African-American children. This is the first study to our knowledge that has shown a performance effect for self-affirmation.

This study tested several potential mediators for this link between self-affirmation and improved academic performance. Specifically, this study tested rumination, acceptance of the article about the test, and the participants' perceptions of their evaluators.

Although we did not find a main effect for self-affirmation increasing the acceptance of the article on the RAT task, we will run these analyses again with a larger sample. It may be that the limited power of a sample of 51 participants could not get at these subtle effects. In addition, in such a highly academic sample, there may have been a floor effect of acceptance of the article. Indeed, participants averaged about 2.48 out of 7 on the composite article acceptance measure. This suggests that most participants were wary to accept the results of the research cited in the news article about the Remote Associates Task as an intelligence task, in both conditions.

We did not find that self-affirmed individuals were more likely to view their evaluator less negatively. This may be due to the small sample size as the results were in the expected direction, but were non-significant. With a larger sample size, this effect may have been more robust. It is also possible that self-affirmation does not reduce defensiveness in an academic task such as the one in this study. Further studies may be able to determine if self-affirmation increases acceptance of messages that are not health information.

We also predicted that individuals in the self-affirmation condition were less likely to ruminate about their performance on the intelligence test. We found results contrary to this hypothesis and the findings from Koole, et al. (1999). Participants in the self-affirmation condition were just as likely to ruminate as those in the control condition were. However, Koole et al. (1999) used a more implicit measure of rumination, by measuring how many of the words from their mock intelligence task the participant could correctly recognize after completing the test. Our measure was explicit, and participants may have answered in a more socially desirable way, to suggest they had not been thinking about the test and their results. This suggests that self-affirmation's effects on rumination, if they are present, are more subtle than our rumination measure assessed. In fact, self-affirmation may not influence rumination during this task, and further studies may address this discrepancy.

Nevertheless, we did find a laboratory-based performance effect of self-affirmation. This paves the way for future studies to investigate the mechanisms for this effect and the other effects that self-affirmation has on psychological and physiological outcomes. Although many studies have found positive effects that self-affirmation has on accepting relevant health messages, reducing stereotype threat, and reducing stress responding, the mechanisms of self-affirmation are not yet known.

The previous work on reduced defensiveness and increased acceptance looked at potentially threatening, relevant health messages. It may be that the effects of self-affirmation do not apply to research on an intelligence test, much like our article. Participants in those studies were targeted populations. Although our sample rated school as being very important to them, they may not have found the intelligence test article to be relevant to them. The RAT task was described as being in the research stage, and these participants might not have found it to be relevant to their academic goals. Other studies have found that even self-affirmed participants are not more accepting of an article that is irrelevant to them (Sherman, et al., 2000). Perhaps is this task were to be used for something, aside from research, that the participants found important, they would have been more accepting of the article in the self-affirmation condition.

One important future research direction for this study will be to identify mediators of the self-affirmation-improved performance effect (data processing and analysis is currently underway). There could be a few different pathways for this effect. First, it may be that participants have reduced stress responding to the performance task after writing about their important value. Research has shown that self-affirmation buffers physiological stress responses to a social-evaluative task, such as the Trier stress task (Creswell, et al., 2005). Because our task included an evaluator who was assessing their performance, participants felt that they were being negatively evaluated (Dickerson, Gruenewald, & Kemeny, 2004). Specifically, self-affirmation may reduce stress reactivity in ways that permit students to engage more effectively in difficult and self-threatening academic performance tasks.

Future studies from our laboratory will feature a larger sample size that investigates reduced stress responding as a potential mediator for the effect of self-affirmation on performance. Data investigating reduced stress responding as a mediator for the improved

performance in those who affirmed their self is being analyzed. This study is using psychophysiological correlates of autonomic arousal, which many other studies have used to measure stress. In addition, we will look at salivary cortisol to determine if the RAT task had an effect on this hormonal marker of stress. We will also look at an individual's cognitive appraisal of stress prior to the intelligence test using the Transactional Stress Questionnaire, and their perceptions of stress following the test (Gaab, Rohldeder, Nater, & Elhert, 2005).

We will also look at a more implicit measure of rumination, similar to Koole, et al. (1999), in which we will give a memory test to determine if participants remember words from the RAT task. Presumably, those who remember a greater number of words from the task have been thinking about their performance on this task more (Koole, et al., 1999). We plan to look at feelings of love and connectedness as a potential mediator for this performance effect, following Crocker, et al. (2008). In addition, we will investigate the potential pathway for self-affirmation's effects on performance for increased mindfulness by looking at how attentive the participants were to the writing task using questionnaire measures (Brown & Ryan, 2003).

Another possible mediator could be that self-affirmation increases openness and attention to the task. The Remote Associates Task is better classified as a measure of creativity (Mednick, 1963). It may be that the more open-minded the participant is during the task, the more likely they will be to find the associated word. Participants who have affirmed a personal value have been shown to have an attentional bias towards words in a relevant, and yet threatening, health message (Klein & Harris, 2009). In addition, self-affirmation can make individuals more open to the strength of an argument (Correll, Spencer, & Zanna, 2004). These results suggest that self-affirmation may alter the focus of attention, and make individuals more open-minded. If this is true, performance on a creativity task may be enhanced by self-affirmation.

By going through the process of writing about an important value, participants seem to transcend the self, which could also mediate the performance effect found in the present study. A recent study found that feelings of love and connectedness with others mediated the reduced defensiveness effects of self-affirmation (Crocker, et al., 2008). This may mean that participants who write about an important value strengthen their global perceptions of self, and are then less driven by ego-satisfying principles for the performance task. They may have less attention devoted to improving their global sense of self, and are better able to make the word associations.

Finally, it may be that the self-affirmation task improves mindfulness in those participants. Mindfulness has been investigated recently as a potential way to control attention to a task. (Langer and Moldoveanu, 2000). If participants who write about an important value are better able to pay attention to the RAT task, they may also receive better scores. In addition, research suggests that increased mindfulness allows for enhanced awareness of many ways to solve a problem (Langer and Moldoveanu, 2000). Further investigations into the connection between self-affirmation and mindfulness are underway.

In summary, the present findings are one of the first showing direct effects of self-affirmation improving performance on a motivated academic performance task, and are consistent with field studies of self-affirmation writing in middle school children (Cohen, et al. 2006; Cohen, et al. 2009). We are presently exploring potential mechanisms of this effect.

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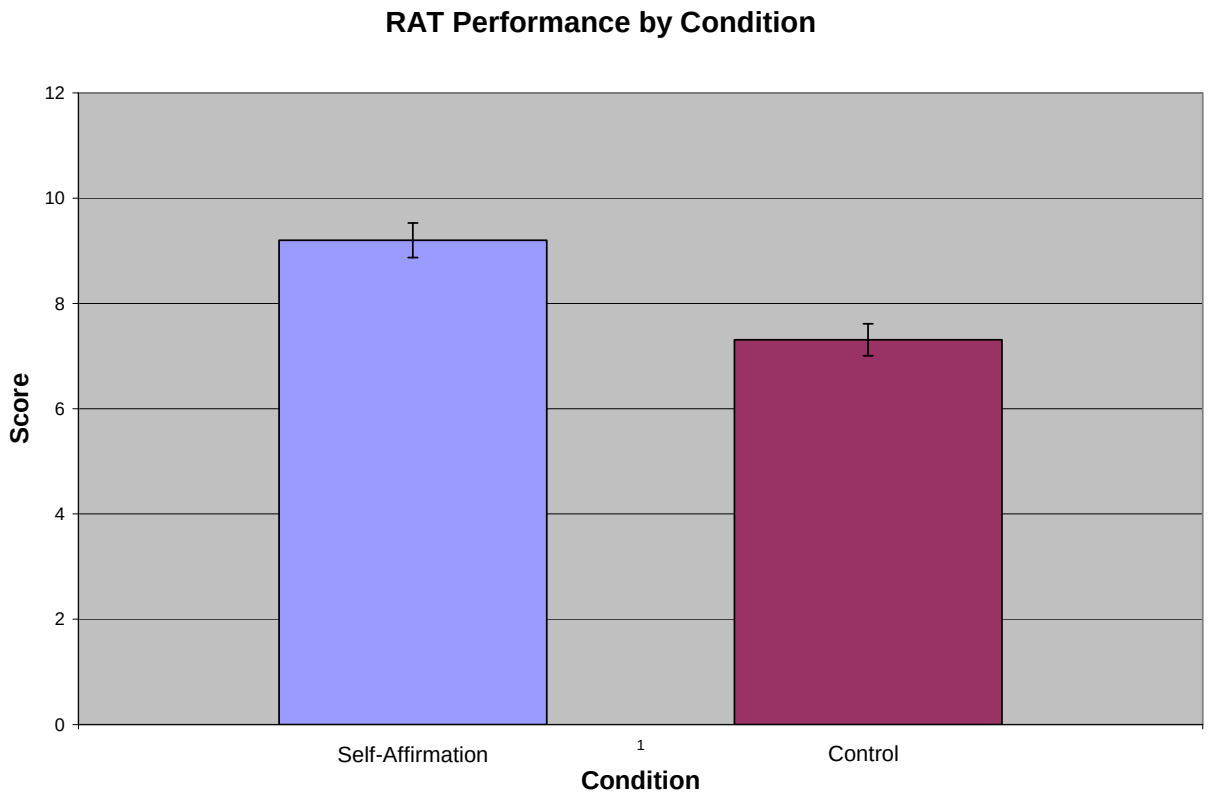
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Table 1. Means and Standard Deviations by Condition for Acceptance, Evaluator Perception and Rumination

	Self-Affirmation *(n=25)*	Control *(n=26)*
Article Acceptance		
M	2.51	2.46
SD	.195	.187
Perceptions of Evaluator		
M	3.49	3.77
SD	.254	.254
Rumination		
M	4.52	3.95
SD	.383	.368

Figure Caption

Figure 1. Performance on RAT task by condition.


RAT Performance by Condition
12
10
8
6
4
2
0
Score
Self-Affirmation
1
Control
Condition