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Emily Gavel

Emily.Gavel@Colorado.EDU

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Effect of Self-Affirmation on Self-Control in a Cheating Context

Emily M. Gavel

Department of Psychology & Neuroscience

University of Colorado Boulder

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Committee Members:

Akira Miyake (Advisor), Department of Psychology & Neuroscience

Eliana Colunga (Honors Council Representative), Department of Psychology & Neuroscience

Charles Danforth, Astrophysical & Planetary Sciences

### **Abstract**

This study examined the effect self-affirmation has on a self-control task in a novel way. A dependent measure of self-control was created that tempts participants with an opportunity to cheat. Participants were given a generous incentive to do well on the dice game task, but in order to 'win' they had to cheat (i.e. fail to exhibit self-control). It was hypothesized that participants would be less likely to cheat in the affirmation condition because self-affirmation will have induced a higher mental construal and therefore improved self-control. An individual differences measure was included to examine a possible moderation effect based on individual's natural self-control levels. It was hypothesized that those with natural high self-control will be less affected by the affirmation. Results indicated that even though more non-affirmed participants did cheat than self-affirmed participants, self-affirmation did not significantly improve self-control. Secondly, participants in the two groups did not significantly differ in mental construal. Furthermore, results presented an individual difference in inhibitory self-control levels, but this was not a successful moderating variable of self-control behavior. These results provided new evidence for self-affirmation effects on self-control, but mainly suggests that further research should be conducted that includes a distinct measure of self-control (e.g. a cheating opportunity) and encompasses an individual differences covariate to account for a possible moderation effect of natural self-control levels.

*Keywords:* Self-affirmation, self-control, mental construal levels, cheating opportunity

### **Effect of Self-Affirmation on Self-Control in a Cheating Context**

Self-control is an essential aspect of the self that can help provide a sense of attainment in our lives (Baumesiter, Vohs, & Tice, 2007). Yet, even though self-control allows us to achieve our dreams and accomplish our goals, humans frequently act in contradiction to their aspirations (Fujita, 2008). Improvements in self-control are highly sought after because it is an aspect of the self, that when enhanced, can dramatically benefit one's livelihood. As individuals mature into adulthood, it is expected that they have learned to improve their self-control. High self-control is associated with success in life, while low self-control is associated with impulse-control problems such as overindulging in food, sex, alcohol, drugs, and materials (Goto & Kusumi, 2013). Failures of self-control are all too common because it is much easier to give in to the temptation of a delicious candy bar than it is to deny it. Current research seeks to explore a possible intervention that could help improve one's sense of self and self-control.

Self-control is the ability to override a dominant response or to deny a temptation. The current study proposes three main objectives about improvements in self-control. The first is to determine if self-control is ameliorated by the act of self-affirmation. The second objective is to examine if the means in which affirmation improves self-control is because self-affirmation induces a higher mental construal; and lastly, to examine if some individuals are affected by the manipulation differently than others based on their natural self-control levels. I tested these ideas by employing a self-affirmation manipulation, a mental construal measure, and an individual differences measure of natural inhibitory self-control (e.g. antisaccade task).

### **Current Research Main Objectives**

#### **Objective 1: Self-Affirmation Improves Self-Control**

The first main objective of this research is to determine whether self-affirmation enhances self-control. Research has suggested that self-affirmation can improve self-control (Schmeichel & Vohs, 2009), executive functioning (Harris, Harris, & Miles, 2016), and curbing reactions to a self-threat (Schmeichel & Vohs, 2009). Self-affirmation is any action or behavior that stimulates an individual's "perceived integrity of the self" and one's social adequacy (Steele, 1988, p. 291). One of the most influential ways of invoking self-affirmation is by expressing one's top values in life (Schmeichel & Vohs, 2009).

Harris et al. (2016) created a study that explored the effect of self-affirmation on self-control by using two executive functioning (EF) tasks (e.g. an inhibition task and working memory tasks). Harris et al.'s (2016) dependent measure of self-control was accuracy and response time on the inhibition task (Stroop task) and the working memory task (2-back task). During the experiment, the researchers manipulated half of the participants to self-affirm their top core value by instructing them to rank a list of 11 values and then have them explain why their number one value is important to them. Meanwhile the other half of participants ranked the same 11 values and were instructed to write about why their seventh value might be important for someone else. Schmeichel and Vohs (2009) claim that encouraging participants to express their core values and then to describe the values' importance in their lives is "likely to promote the kind of broad-minded, big-picture perspective that is associated with good self-control," (Schmeichel & Vohs, 2009, p. 776). Harris et al. (2016) found that self-affirmation improved performance, accuracy, and speed on both executive functioning tasks and concluded that self-affirmation improved individual's self-control. Thus, the current study sought to extend the

Harris et al. (2016) study and test the hypothesis that self-affirmation improves self-control in a cheating context.

### **Objective 2: Self-Affirmation Promotes a Higher Mental Construal Which Improves Self-Control**

The second main objective of this study is to determine if self-affirmation improves self-control because self-affirmation promotes a higher mental construal. A high mental construal helps enhance the abstract, global, and goal-relevant implications of one's choices; while low-construal focuses on the instant-gratification and concrete features of a choice that do not promote higher implications of choices or behavior (Fujita & Carnevale, 2012). Individuals with a high mental construal consider how their choices will impact their long-term goals. In contrast to those with a lower mental construal, who think more concretely about temptations and are likely to fail to exhibit self-control in order to satisfy their instant gratification needs (Fujita & Carnevale, 2012). Current research hypothesizes that self-affirmation is a means in which mental construal is enhanced and therefore together, improve self-control.

Previous research has suggested that a high mental construal improves self-control. Fujita and Han (2009) built their research off of Fishbach, Friedman, and Kruglanski (2003) and Fishbach and Shah (2006) which attempted to manipulate a participant's mental construal into either high or low construal by having them describe *how* they maintain personal relationships (low-level) or *why* they maintain personal relationships (high-level). Self-control was measured by the degree to which the individual associated eating a candy bar as a negative action. Their study demonstrated that a higher mental construal encouraged individuals to associate negative temptations with negative long-term outcomes; therefore these evaluations helped enhance self-control (Fujita & Han, 2009).

In a study conducted by Schmeichel and Vohs (2009), researchers demonstrated that self-affirmation promoted a higher mental construal and in turn improved self-control. During the Schmeichel and Vohs (2009) study, participants went through a self-affirmation manipulation alike what was described earlier in Harris et al. (2016) and what is also employed in the current study. Participants were randomly assigned into either the self-affirmation condition or the control condition. All participants then completed a construal level measure, the Behavioral Identification Form (The BIF). Schmeichel and Vohs (2009) found that those who were in the self-affirmation condition were more likely to select the higher-level descriptions than individuals in the no-affirmation condition. They concluded from this study that self-affirmation promoted a higher mental construal.

In another study conducted by Schmeichel and Vohs (2009), the researchers examined if construal levels have an intervening effect on self-affirmation's beneficial effect on self-control. In this experiment, all participants ranked the same 11 values by personal importance. Then, a construal manipulation followed. Participants were either asked to describe *how* they pursue their top core value (low-construal) or *why* they pursue their top ranked value (high-construal). All participants self-affirmed a core value, but only half of the participants self-affirmed at a high mental construal while the other half self-affirmed at a low mental construal. Then, experimenters prompted a measure of self-control. This was a puzzle persistence task, wherein if the participant chose a circle, the computer would freeze for three seconds and would award the participant three points. If the participant chose a square, the computer would freeze for 15 seconds and would award the participant 15 points. It was reasoned that choosing the larger delay for ultimately more points over the smaller delay for fewer points was an indicator of good self-control. Therefore, the amount of points individuals scored during the game served as the

dependent measure of self-control. Results supported the study's hypothesis; that self-affirmation at a high mental construal improves self-control while self-affirming values at a low mental construal does not. On the basis of such findings, the current study attempted to test the hypothesis that self-affirmation promotes a higher mental construal which in turn enhances self-control behavior.

Important to note, during Schmeichel and Vohs's (2009) study, they employed a mood check questionnaire to ensure that the difference in self-control behavior between the two groups was not due to a differing mood state that the affirmation manipulation might have induced. The researchers found no difference in mood between the two groups, as measured by the Positive and Negative Affect Schedule (PANAS), attributing all self-control differences to the affirmation manipulation. This same mood check will be used in the current study and will test the hypothesis that the affirmation manipulation will not induce a different mood state from the control group.

### **Objective 3: Moderation Effect of Natural Self-Control**

The third main objective of this study is to determine if the affirmation manipulation affected individuals differently based on their natural self-control level. Just from observation in daily life, it is clear that some individuals are able to exhibit self-control more easily than others, but what contributes to this difference? In the current study it is reasoned that because some individuals have higher self-control than others, the manipulation will produce differing effects based on individual's natural inhibitory self-control. The individuals that naturally exhibit high self-control will have less room to improve than those with low self-control. I hypothesize that individuals with natural high self-control tendencies will be less affected by the affirmation manipulation. I evaluate this claim by including an individual difference covariate, the

antisaccade task, a measure of natural inhibitory self-control. I do this in order to determine if cheating behavior is moderated when individuals have differing self-control levels.

### **Limitations of Past Self-Control Research**

The self-control studies published in the psychology literature have some important weaknesses. The main limitation of studies pertaining to self-control improvements tends to be the dependent measure of self-control. Many of the dependent measures used in previous research tend to be more like decision-making tasks instead of self-control tasks. Some studies have measured self-control by the amount of time participants could hold a handgrip for (Fujita et al., 2006), the amount of time participants could hold their hand in a cold bucket of water, (Wan & Agrawal, 2011), and whether participants would come back for an experiment session two for \$50, but was held at 2 A.M. - 5 A.M., (Fujita & Roberts, 2010). Handgrip strength and pain tolerance varies widely from person to person, so there is nothing for participants to override in these tasks. The problematic second study session time is not a proper way to measure self-control if self-control is defined as a deliberate action to override a response that interferes with one's goals.

Another problem is employing a distinct measure that distinguishes between participants who exhibited self-control and those who did not. Fischbacher and Föllmi-Heusi (2013) created a study to measure honesty and lying and employed a dice game task. In this dice game task, researchers gave participants a physical die to roll and told them there would be an individual payoff based on what they rolled. Participants are ensured that they are the only ones that will know the roll outcome. This design has no accurate measure of whether or not the participants actually reported a false number; cheating could not be assessed on the individual level. The

inconsistency in self-control measures prompted me to create a new task that allows for a concrete measure of self-control on the individual level.

Another identified problem is that most of the self-control studies that employ a cheating opportunity never report whether or not their participants were suspicious of the study or 'cheating task'. Given that a cover story must be presented to engage a cheating opportunity, this lack of insight is concerning. Von Hippel, Lakin, and Shakarchi (2005) created a study where participants were asked to complete math questions on the computer. However, this computer task was pre-programmed with a 'bug', where the answer for the math question would show up on the screen. Participants are foretold about this bug in the program and are instructed to hide it as soon as they can. The measure of self-control was how long it took participants to hit the spacebar to hide the 'bug'. This measure is problematic because the premise of this 'bug' in the program is highly conspicuous and participants are never probed about their suspicions about the study. In order to overcome this limitation, current research screened participants for any suspicions about the study.

Furthermore, almost all research on self-control and/or cheating behavior has evaded the step of asking their participants to guess what the purpose of the study was. This is an important step in all research; it is problematic if a participant realizes the true nature of the study because the way they react and respond to experimental tasks will inevitably be influenced. It is extremely important that researchers screen participants as to what they believe the purpose of the study was and if they had any suspicions during the study. Current research made sure to include both of these crucial screening questions.

### Present Study

In order to test the main goals stated previously, I set up the study in a novel way that offered a genuine temptation for participants to override. I created a simple dice game task where I attempted to give participants an opportunity to cheat. Participants completed a dice rolling game and recorded their own matches and non-matches, while the experimenter sat behind a divider. However, unbeknownst to the participant, the dice game was fixed. The game was preprogrammed so participants only received six matches, when they needed seven in order to be entered into a raffle for a \$100 Amazon gift card. Therefore, if any participant had more than six matches, it was a clear indication that they cheated in order to accept the raffle temptation. The entire procedure of this study is illustrated in Fig. 1.



Figure 1. Current study procedure chart

### Predictions

1. Those in the self-affirmation condition should be less likely to cheat on the dice game task than those in the no affirmation condition.
2. The difference in self-control behavior between the two groups should be due to the higher mental construal that the self-affirmation promoted. In other words, those in the self-affirmation condition should have a higher mental construal, as measured by the BIF, than those in the no affirmation condition.

- a) There will be no significant difference between the two group's current mood, as measured by the PANAS.
3. Individuals who naturally have high self-control, as measured by the antisaccade task, should be less affected by the self-affirmation manipulation. Thus, those with lower self-control should experience the most benefit from the manipulation.

## **Method**

### **Participants**

Sixty participants were recruited from the Psychology and Neuroscience human subject pool at The University of Colorado Boulder. On the basis of the exclusion criteria that will be discussed at the beginning of the results section, seven participants were excluded for minor reasons. I conducted analysis on 53 participants (34 female, 19 male). Participants were randomly assigned to either an *affirmation condition* ( $N = 24$ ) or a *no affirmation condition* ( $N = 29$ ). Participants received credit towards their Introduction to Psychology course, while there were alternative credit options available.

### **Materials and Procedure**

Each participant was tested individually during a single study session. Sessions lasted approximately 40 minutes. The experimenter stayed in the room with the participant for the entire duration of the experiment. However, there was only one task where the participant and experimenter were side by side. The rest of the tasks and questionnaires were completed with the experimenter on the opposite side of the room behind a divider. In order to prevent experimenter influence and expectations, the two experimenters ran both conditions and read verbatim from a script. Furthermore, this was a double-blind study. The manipulation was concealed in manila

folders so experimenters had no knowledge of which condition the participant was assigned to. As well, participants had no knowledge about there being a condition assignment.

The entire procedure for this study is illustrated in Fig. 1. Students first completed an antisaccade task on a computer program. This is the only task that the experimenter and participant are side by side. For the remaining tasks, the experimenter provided instructions and then went behind a divider while the participant's completed the following tasks. Participants moved on to the self-affirmation manipulation task. Participants were either asked to select a top core value to describe (affirmation condition) or asked to describe their daily routine (no affirmation condition) with a pen and paper. Next, all participants completed the first questionnaire, which included the Behavioral Identification Form (BIF) followed by the Positive and Negative Affect Schedule (PANAS). This questionnaire and the following tasks were all conducted on a computer. Participants then moved on to the self-control dependent measure, the dice game task. Participants were incentivized to do well on this task by being offered a chance to win a \$100 Amazon gift card for those who correctly predicted more than six dice rolls. After the dice task, participants are asked some questions about the dice task to further increase the cover story. Then lastly, participants filled out a final questionnaire, which included two demographic questions as well as two questions to screen for any suspicions or correct guesses about the purpose of the study. Then all participants were debriefed in person about the deception used in the study and received a written feedback sheet; which included contact information for any questions or concerns. Participants received their partial credit for their class course and were dismissed. All tasks are described in larger detail below.

**Antisaccade task.** This task is an inhibition self-control task and served as the individual differences covariate measure of natural self-control. During the antisaccade task, participants

were exposed to stimuli on the computer screen and were instructed to say a target number out loud. First, participants saw a cross in the middle of the screen. After some time, the cross is replaced by a black cue box, which appeared on either the right or the left-hand side of the screen. Immediately following, the black cue box disappeared and a quickly flashed number showed up on the opposite side of the screen, that was almost immediately covered up.

Participants are instructed to say this target number out loud to the experimenter so they can type it into the keyboard for recording accuracy. However, if the participant did not inhibit the natural response to look away from the first black cue box fast enough, then they will have missed the quickly flashed number and thus gained a lower score on the antisaccade task, equating to a lower natural inhibitory level. There were 12 practice trials, and two blocks of 36 incongruent trials. For data analysis purposes, each participant's performance was scored as a proportion of the amount correct out of 72 trials. This was then z-scored for a logistic regression analysis to help answer the study's third main objective.

**Self-affirmation manipulation task.** All participants were handed a sealed envelope (so that experimenters stayed blind to condition assignment) that held instructions for the following task. Experimenters were instructed to walk behind the divider. Experimenters allowed eight minutes of writing in each condition by using a stopwatch. After the eight minutes, experimenters asked the participant to stop writing and to put the paper back inside the envelope. Experimenters were instructed not to return to the participant's desk until the paper was completely back in the envelope, so that the conditions stayed blind to the experimenter.

Participants in the Affirmation Condition read instructions in Appendix A; while participants in the No Affirmation Condition read the instructions in Appendix B. Two experimenters examined the writings to ensure participants followed instructions. Experimenters

concluded with 100% agreement on which participants did and did not follow the writing instructions. Three participants from the affirmation condition were excluded from data analysis due to insufficient writings.

**The BIF & the PANAS questionnaire.** Both questionnaires were administered on the computer. The Behavioral Identification Form (BIF) was completed first. The participant was asked to describe 25 different activities or behaviors into an appropriate description. The participant was given two choices. One option was correlated with high mental construal and the other choice was associated with a lower mental construal. The purpose of the BIF questionnaire at this point in the experiment was to determine if the self-affirmation manipulation had promoted a higher mental construal as Schmeichel and Vohs (2009) had suggested in previous research. For data analysis purposes, when a participant chose the higher construed choice, this was equivalent to a 1 and if they chose the lower construed choice, this was scored as a 0. Participant's BIF score was the amount of higher-level choices out of 25. The BIF is provided in Appendix C.

Second, the Positive and Negative Affect Schedule (PANAS) was completed. The PANAS lists 20 emotions an individual could have experienced in their life, in the past couple of weeks, or in the current moment. In this study, participants were instructed to scale to what degree of that emotion they were experiencing in the current moment from 1-5; 1 being not at all or very slightly and 5 being extremely. The PANAS at this part in the experiment served as a mood check. For data analysis, positive affect and negative affect emotions were analyzed separately, in accordance with past literature. The PANAS questionnaire is provided in Appendix D.

**Dice task.** The dice task served as this study's dependent measure of self-control. The experimenters described the task as follows:

*"This next task is a game. The objective of this game is to correctly predict a dice roll 36 separate times. Our lab is test running this game for a future study, so I will be asking you some questions about the task afterwards.*

*We would like to thank all of our participants for helping us out with this test running, by rewarding them gift cards, but we have a limited budget as you might imagine. So, we decided to have a one large prize instead of a lot of little ones. So, those who can correctly guess above the expected average of this game will have the chance to win a \$100 Amazon gift card.*

*There will be 36 dice rolls, so the expected average would be 6 correct rolls. Therefore, if you can guess 7 or more correct dice rolls, you will be entered into the raffle."*

The dice game raffle sheet (Appendix E) was then placed in front of the participant and they were prompted to read the instructions.

Then the experimenter explained how the dice game works. Participants were instructed to first click on a die (1-6) for what they predicted would be rolled. The next screen was a die rolling. They were instructed to hit the spacebar when they wanted the die to roll to a stop. Depending on the outcome, they either wrote an X or a MATCH on the raffle sheet next to the corresponding roll. Participants and experimenters went through three practice trials together. Experimenters then walked behind a divider separating the participant and experimenter. The participant then completed 36 trials. After participants completed the dice task, participants were asked to tally up the amount of correct matches and then to place their raffle sheet in either the '\$100 Amazon raffle' folder or the 'no raffle' folder. The experimenter waited behind the divider until participants had completed this last step.

The participant was led to believe that this was a completely randomized game. However, the computer program was rigged so that the participant would only ever get six matches, but they needed seven to be entered into the Amazon raffle. There were six pre-programmed rolls (2, 9, 10, 15, 18, and 23) that always registered as a match with the participant's prediction.

However, for the 30 other rolls, the computer was programmed so that the participant's prediction never matched. Therefore, if a participant had written 'MATCH' next to any roll besides those six designated rolls, then it was clear that the participant had cheated (i.e. exhibited low self-control) in order to be entered into the \$100 Amazon Raffle.

**Dice task questionnaire.** Participants then filled out a questionnaire about the dice task they just performed. The purpose of this questionnaire was to make more plausible the deceptive cover story about the dice game task. Subjects were asked to respond to nine questions on a 7-point Likert scale, with 1 being entirely disagree and 7 being entirely agree. The questionnaire is provided in Appendix F.

**Final questionnaire.** Lastly, participants filled out a final questionnaire that included simple demographic questions (age and gender); as well as a suspicion level check and a question that asked participants what they thought the purpose of the study was. Final questions are provided in Appendix G.

## Results

### Preliminary Analyses

**Exclusion criteria.** Before exclusions, there were 29 participants in the affirmation condition and 31 in the no-affirmation condition. There were seven total participants that were excluded from data analysis. There were five participants excluded from the affirmation condition ( $N = 24$ ) and two participants from the no-affirmation condition ( $N = 29$ ). The reason there were more participants excluded from the affirmation condition was because the writing instructions for the self-affirmation condition were more demanding than the instructions given to the no-affirmation condition. Affirmation participants were asked to describe a more detailed and personal topic than non-affirmed participants, which resulted in more participants from the

affirmation condition not meeting the writing requirements. My exclusion criteria were as follows:

- Participant did not complete the experimental session ( $n = 1$ )
- Participant correctly guessed the hypothesis or purpose of the study ( $n = 1$ )
- Participant had correct suspicions about the premise of the dice game ( $n = 2$ )
- Participant did not meet the writing requirements of the manipulation ( $n = 3$ )
  - Failed to describe how or why a certain value is important to them

Important to note, it was clear that almost all of the participants believed in the cover story presented and stayed unaware of the purpose of the study. Those who correctly guessed the purpose of the study, (2%), and those that were suspicious about the premise of the dice game task for the correct reasons (i.e. mentioned honesty or cheating) (4%) were totally excluded from data analysis.

### **Main Results**

The first hypothesis was that those in the self-affirmation condition would cheat less than those in the no-affirmation condition. Results show that more participants did cheat in the no-affirmation condition (27%) than the affirmation condition (21%). A chi-square test of independence was performed to examine the relation between participant's condition and their cheating behavior. The relation between these variables was reported as nonsignificant,  $\chi^2(2, N = 53) = 0.324, p = .57$ . Therefore, the first hypothesis was not supported. A detailed contingency table is below in Table 1. Participants in the affirmation condition and participants in the no-affirmation condition did not significantly differ in their cheating behavior.

	Cheat	No cheat	<i>Marginal totals</i>
Affirmation	5	19	24
No affirmation	8	21	29
<i>Marginal totals</i>	13	40	53

Table 1. Contingency table of cheating behavior

The second hypothesis was that those in the affirmation condition would be promoted to think in a higher mental construal than those in the no-affirmation condition. The BIF group comparison between the affirmation condition ( $M = 16.08$ ) and the no-affirmation condition ( $M = 14.55$ ) showed no significant difference,  $t(52) = 0.99, p = .32$ . Therefore the self-affirmation manipulation failed to promote a higher mental construal. The second hypothesis was not supported in this experiment. Group differences in BIF responses are detailed below in Table 2.

<b><i>BIF Responses</i></b>	<b>Mean (SD)</b>
Affirmation	16.08 (4.94)
No affirmation	14.55 (6.01)

Table 2. Group differences in BIF responses out of 25 points.

A part of the second hypothesis was that there would be no difference between the two groups current mood state, as measured by the PANAS. Group comparisons between positive and negative affect emotions showed no significant differences between groups. There were 10 positive affect emotions and 10 negative emotions listed in the PANAS questionnaire. For data purposes, the negative and positive emotions are analyzed separately. Overall on a five-point scale, with 1 being very little to 5 being extremely, participants had little to moderate positive affect ( $M = 2.3$ ), and little to no negative affect ( $M = 1.34$ ). There was no significant difference

in positive affect between the affirmation group ( $M = 2.41$ ) and the no-affirmation group ( $M = 2.21$ ),  $t(52) = 0.99$ ,  $p = .33$ ; nor for negative emotions between the affirmation group ( $M = 1.33$ ) and the no-affirmation group ( $M = 1.35$ ),  $t(52) = -0.17$ ,  $p = .86$ . This confirms that the affirmation manipulation did not induce a differing mood state than the control. Part of my second hypothesis was supported. The group differences in positive and negative affect responses are detailed below in Table 3.

<b><i>Positive Affect</i></b>	<b>Mean (SD)</b>
<b>Affirmation</b>	2.41 (0.78)
<b>No affirmation</b>	2.21 (0.71)

<b><i>Negative Affect</i></b>	<b>Mean (SD)</b>
<b>Affirmation</b>	1.33 (0.28)
<b>No affirmation</b>	1.35 (0.45)

*Table 3. Group differences in PANAS responses on a 1-5 scale. Positive and negative affect responses are analyzed separately.*

The third hypothesis examined a possible moderation effect. It is believed that some individuals naturally have high inhibitory self-control and would yield a high performance score on the antisaccade task. Therefore because of this individual difference, I predicted that those with high natural self-control would be less affected by the affirmation manipulation. Group differences of antisaccade performance are detailed below in Table 4.

<b><i>Antisaccade Performance</i></b>	<b>Mean (SD)</b>
<b>Affirmation</b>	47.24 (13.78)
<b>No affirmation</b>	49.24 (12.05)

*Table 4. Group differences in antisaccade performance out of 72 points.*

In order to test the moderating hypothesis that some individuals will be affected by the manipulation differently than others, a logistic regression analysis was conducted. This helped determine if natural self-control levels moderated cheating behavior on the dice game task. A table detailing the logistic regression is listed below in Table 5. With this logistic regression model, I was able to predict the probability of cheating based on a participant's assigned condition and their performance on the antisaccade task. The interaction resulted in nonsignificance at  $p = .38$ . Self-control behavior was not moderated by individual's natural inhibitory self-control. The third hypothesis was not supported.

	$\beta$ (se)	p-value	OR
<b>Intercept</b>	-1.14 (.33)	0.0005	0.32
<b>Condition</b>	-0.18 (.33)	0.58	0.83
<b>Antisaccade</b>	-0.17 (.37)	0.65	0.85
<b>Condition * Antisaccade</b>	-0.33 (.37)	0.38	0.72

*Table 5. Logistic regression analysis results displaying the interaction effect between participant's condition and their performance on the antisaccade task.*

### Discussion

The three main objectives of this study were to (a) determine if self-affirmation improved self-control in a cheating opportunity; (b) to examine if self-affirmation's beneficial relationship with self-control is due to affirmation promoting a higher mental construal; and (c) to examine a possible moderation effect of natural high inhibitory self-control levels on latter self-control behavior. The results were clear for the main objectives of this study. For the first and second objectives, there was no supporting evidence that self-affirmation improved subsequent self-control; nor was there evidence to suggest that those who self-affirmed a core value were induced to a higher mental construal. As for the third objective, individuals' natural inhibitory

self-control levels were not a significant moderating variable for self-control behavior on my dice game task. In the rest of this article, I will discuss the implications of these findings.

### **Objectives 1 & 2: Implications of Affirmation Improving Self-Control because Affirmation Promotes a High Mental Construal**

Self-affirmation did not substantially improve self-control nor did self-affirmation promote a higher mental construal in this empirical study, which was not in line with previous research. There could be a few explanations for this incongruence between results. The most obvious explanation is that the current study used an original dice game task as the measure of self-control. The decision to create this dice game task was to employ a cheating opportunity to measure self-control. The cheating opportunity was validated as a good measure of self-control because self-control is defined as resisting a temptation or overriding a dominant response. This task provided a temptation for participants to decide to override or not. However, my results were not consistent with previous research from Schmeichel and Vohs (2009), Fujita and Han (2009), nor Harris et al. (2016). It could be possible that past literature's measures of self-control, that were more like decision-making tasks, showed the effect of improvement in self-control but my measure did not. It could also be the case that my dice game task was not a valid measure of self-control, this will be discussed further in the limitations section.

A second thought that might explain the incongruent results between this current study and past research is that Schmeichel and Vohs (2009) and other studies may have concluded their significant results based on a false positive. The study conducted by Schmeichel and Vohs (2009), which the current study is most closely based upon, had a very small sample size ( $N = 29$ ) that they concluded significant results from. It is possible that, by chance, Schmeichel and Vohs's (2009) affirmation condition naturally had higher self-control compared to the no-

affirmation condition; yet the difference in self-control behavior between the two groups was attributed to the affirmation manipulation. It could be the case that Schmeichel and Vohs's (2009) study did not actually find a significant effect of self-affirmation improving self-control and they concluded with a false positive.

Nevertheless, it makes sense that self-affirmation might promote a higher mental construal and therefore help improve self-control. Self-affirmation can promote individuals to feel adequate and accepted which leads them to think about their goal-relevant objectives. At the same time, a high mental construal allows an individual to recognize the broader picture and the motivations behind their actions. Self-affirmation might be one way in which a high mental construal is promoted. With a high mental construal, individuals will be more motivated to complete a task or duty because they understand the reason why they are doing it and how it will affect their long-term goals. However, future research should consider alternative methodology to evaluate if self-affirmation might promote a higher mental construal, which in turn could improve self-control.

### **Objective 3: Implications of Measuring Natural Self-Control Levels Moderating Subsequent Self-Control**

Current research included the antisaccade task, a common inhibitory self-control measure, as an individual differences covariate measure. This is a task that measures participant's ability to inhibit unrelated stimuli in order to achieve the short-term goal of identifying a target number. This is in congruence with the study's operational definition of self-control, which is to deny a temptation or to override a dominant response. After examining the antisaccade task accuracy results, it was obvious that there was a clear individual difference in natural inhibitory self-control levels between the subjects. Although, it was found that natural

self-control levels did not have a significant moderating effect on subsequent self-control behavior in this empirical study. We know from daily observation that some people are better at exhibiting self-control over others. The interaction between assigned condition and natural self-control levels illustrated that those in the affirmation condition with high natural self-control, as measured by the antisaccade task, were the least likely to cheat on the dice game task. This finding presented the idea that individuals are affected differently based on their natural self-control levels and condition assignment, though not statistically significant.

Nevertheless, by highlighting the individual difference in natural self-control levels, I was able to determine if the affirmation manipulation produced differing effects for participants based on their natural self-control level. It is important that future research continues to recognize that there are varying degrees of natural self-control levels that individuals hold. Therefore, they should include an individual differences measure to determine if the intervention might be more beneficial for a certain group of people. The interaction results illustrate that an individual has to already exhibit high self-control and then be manipulated to self-affirm a core value in order to receive the most benefit.

### **Limitations, Future Directions, and Concluding Remarks**

**Limitations.** The lack of a significant effect of the affirmation intervention is not congruent with previous studies. There were a few possible explanations mentioned earlier that may constitute as a limitation in the current study. One possible limitation was the employment of a brand new self-control task. It is possible that some participants did not recognize there was an opportunity to cheat. Obviously, it is never explicitly stated that there is an opportunity but there was also no measure to check if individuals realized there was an opportunity to cheat.

Future research using a cheating opportunity might benefit from employing a measure check at the end of the experiment.

A second limitation might be that participants may not have been incentivized by the chance to win a \$100 Amazon gift card in a raffle. It is possible that the premise of a raffle was unappealing to some participants because they feel like they are unlucky and will never win a raffle. Therefore, it could be the case that the raffle did not incentivize some participants enough to cheat on the dice game task. If this is true, future self-control research needs to employ a new incentive that appeals to participant's temptations.

The third limitation could be the affirmation manipulation adopted from previous research. Maybe if participants could have chosen their own core value to write about, the manipulation would have had more of an effect. Participants in the affirmation conditions are given a set list of values to choose from. It is possible that there could have been a stronger self-affirmation effect if participants could have chosen their own top core value to write about.

**Future directions.** On the basis of such limitations, future research has a clear indication of the next step to examine self-affirmation's effect on self-control. Future research should continue to include an opportunity to cheat in order to measure self-control. This is because a cheating opportunity forces the participant to decide to give into a temptation or to exhibit self-control. However, future research should implement a different reward to determine if there is a better way to incentivize participants to cheat. Secondly, future research would largely benefit from including another individual differences measure or adding supplementary questionnaires to examine any other factors that might affect self-control behavior, such as trait personality characteristics. If future research included these tasks and/or questionnaires, then empirical

research could further its confidence about self-affirmation's possible beneficial effect on self-control.

**Concluding remarks.** Current literature on self-control is crowded with claims that self-control is improved by a variety of different variables. Self-control literature has claimed that self-control has been improved by inducing some type of higher state of mind or a larger-than-self concept. Research has attributed improved self-control to increased gratitude in one's life (DeSteno et al., 2014), implicit reminders of religious themes (Rounding et al., 2012), inducing a higher mental construal (Fujita et al., 2006), and the self-affirmation of personal core values (Schmeichel & Vohs, 2009), just to name a few. These specific actions or concepts allow individuals to see the world as larger than oneself. This promotes thoughts that support long and short-term goals that encourage individuals to exhibit self-control.

In conclusion, this study did not validate that self-affirmation, an action that stimulates the integrity and adequacy of the self, improved self-control. Future research with improved methodology should continue to evaluate the relationship between self-affirmation, mental construal, and improvements in self-control because it could have profound implications for individual fulfillment.

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## Appendix A

## Affirmation Writing Manipulation

This is a writing exercise that is going to ask you to rank certain values and characteristics.

After you rank these items, FLIP THE PAGE. You will be asked to explain your first value in further detail. We are interested in gathering writing samples from a variety of students. Do not worry about grammar or how well it is written.

You will have eight minutes to complete this task, please work for the entire eight minutes. Let me know when you have finished reading the instructions so I can start the timer.

Directions:

Below is a list of characteristics and values, some of them may be important to you; some may be unimportant to you. Please rank them from 1 to 11 according to how important they are to you ("1" being the most important item, "11" being the one that is least important to you). Use each number only once.

- Being Good at Art
- Physical Attractiveness
- Relationships with Friends or Family
- Independence
- Membership in a Social Group
- Music
- Politics
- Creativity
- Religious Values
- Sense of Humor
- Sports Ability

Directions:

1. Look at the value you picked as number 1.
  2. Think about a time when this value was or would be very important to you.
  3. Describe why this value is important to you.
- Focus on your thoughts and feelings, don't about spelling, grammar, or how well written it is.

## Appendix B

## Daily Routine Writing Manipulation

This is a writing exercise that is going to ask you to describe your morning routine.

We are interested in gathering writing samples from a variety of students. Do not worry about grammar or how well it is written just focus on your routine.

I will give you eight minutes to complete this task. Please work for the entire eight minutes. Let me know when you have finished reading the instructions so I can begin the timer.

Directions:

In this writing task please carefully think about your typical morning routine and describe it in detail.

1. Describe what you usually do between getting up and going to class. Focus on the specific steps you take to get prepared for the day.

## Appendix C

## BIF Questionnaire

Any behavior can be described in many ways. For example, one person might describe a behavior as "writing a paper," while another person might describe the same behavior as "pushing keys on the keyboard." Yet another person might describe it as "expressing thoughts." This form focuses on your personal preferences for how a number of different behaviors should be described. Below you will find several behaviors listed. After each behavior will be two different ways in which the behavior might be identified.

For example:

1. Attending class
  - .. sitting in a chair
  - .. looking at a teacher

Your task is to choose the identification, a or b, that best describes the behavior for you. Simply place a checkmark next to the option you prefer. Be sure to respond to every item. Please mark only one alternative for each pair. Remember, mark the description that you personally believe is more appropriate for each pair.

1. Making a list
  - .. Getting organized
  - .. Writing things down
2. Reading
  - .. Following lines of print
  - .. Gaining knowledge
3. Joining the Army
  - .. Helping the Nation's defense
  - .. Signing up
4. Washing clothes
  - .. Removing odors from clothes
  - .. Putting clothes into the machine
5. Picking an apple
  - .. Getting something to eat
  - .. Pulling an apple off a branch
6. Chopping down a tree
  - .. Wielding an axe
  - .. Getting firewood
7. Measuring a room for carpeting
  - .. Getting ready to remodel
  - .. Using a yardstick
8. Cleaning the house
  - .. Showing one's cleanliness
  - .. Vacuuming the floor
9. Painting a room
  - .. Applying brush strokes
  - .. Making the room look fresh
10. Paying the rent
  - .. Maintaining a place to live

- .. Writing a check
- 11. Caring for houseplants
  - .. Watering plants
  - .. Making the room look nice
- 12. Locking a door
  - .. Putting a key in the lock
  - .. Securing the house
- 13. Voting
  - .. Influencing the election
  - .. Marking a ballot
- 14. Climbing a tree
  - .. Getting a good view
  - .. Holding on to branches
- 15. Filling out a personality test
  - .. Answering questions
  - .. Revealing what you're like
- 16. Toothbrushing
  - .. Preventing tooth decay
  - .. Moving a brush around in one's mouth
- 17. Taking a test
  - .. Answering questions
  - .. Showing one's knowledge
- 18. Greeting someone
  - .. Saying hello
  - .. Showing friendliness
- 19. Resisting temptation
  - .. Saying "no"
  - .. Showing moral courage
- 20. Eating
  - .. Getting nutrition
  - .. Chewing and swallowing
- 21. Growing a garden
  - .. Planting seeds
  - .. Getting fresh vegetables
- 22. Traveling by car
  - .. Following a map
  - .. Seeing countryside
- 23. Having a cavity filled
  - .. Protecting your teeth
  - .. Going to the dentist
- 24. Talking to a child
  - .. Teaching a child something
  - .. Using simple words
- 25. Pushing a doorbell
  - .. Moving a finger
  - .. Seeing if someone's home

## Appendix D

## PANAS Questionnaire

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you are feeling these emotions **right now in this moment**. Use the following scale to record your answers.

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely
<input type="checkbox"/> interested			<input type="checkbox"/> irritable	
<input type="checkbox"/> distressed			<input type="checkbox"/> alert	
<input type="checkbox"/> excited			<input type="checkbox"/> ashamed	
<input type="checkbox"/> upset			<input type="checkbox"/> inspired	
<input type="checkbox"/> strong			<input type="checkbox"/> nervous	
<input type="checkbox"/> guilty			<input type="checkbox"/> determined	
<input type="checkbox"/> scared			<input type="checkbox"/> attentive	
<input type="checkbox"/> hostile			<input type="checkbox"/> jittery	
<input type="checkbox"/> enthusiastic			<input type="checkbox"/> proud	
<input type="checkbox"/> afraid			<input type="checkbox"/> active	

Appendix E

Dice Game Raffle Sheet

Directions: In order for the experimenters to determine who is entered into the raffle, you will have to record your own information here for our data purposes. After you click your prediction die on the screen, please translate that onto this paper. Then when the die stops rolling, you will either write **MATCH** for a match or an **X** for no match.

First write your prediction (1-6) and then whether it is a **MATCH** or an **X**.

If you can guess *seven or more* rolls correctly, you will be entered into the raffle for a \$100 Amazon Gift Card

PRACTICE

	Prediction	Match or X
1.	_____	_____
2.	_____	_____
3.	_____	_____

	Prediction	Match or X
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____
11.	_____	_____
12.	_____	_____
13.	_____	_____
14.	_____	_____
15.	_____	_____
16.	_____	_____
17.	_____	_____
18.	_____	_____

	Prediction	Match or X
19.	_____	_____
20.	_____	_____
21.	_____	_____
22.	_____	_____
23.	_____	_____
24.	_____	_____
25.	_____	_____
26.	_____	_____
27.	_____	_____
28.	_____	_____
29.	_____	_____
30.	_____	_____
31.	_____	_____
32.	_____	_____
33.	_____	_____
34.	_____	_____
35.	_____	_____
36.	_____	_____

Number correct: \_\_\_\_\_

\$100 Amazon Raffle

No Raffle

## Appendix F

## Dice Task Questionnaire

Please respond to the questions below using the 7point Likert scaling, with 1 being ENTIRELY DISAGREE and 7 being ENTIRELY AGREE. Write the number underneath the question.

The task was fun.

The task was engaging.

The task was frustrating.

The task was pointless.

The duration of the task was too long.

The task moved too quickly.

The purpose of the task was confusing.

The task motivated me to try my best.

Please put any suggestions on how to make the game more fun or opinions in the box below:

Appendix G

Final Questionnaire

What is your age?

What is your gender?

What do you think the purpose of this study was?

Was the study suspicious in any way?