

Construal Level Effects on Self-Control in Cheating Contexts

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## **Abstract**

Cheating is seen as immoral in most, if not all, cultures and can have negative legal and social consequences throughout life. The ability to stop oneself from cheating is deeply rooted in self-control. Prior research has indicated that the mental construal of events (how a behavior is described), even without conscious effort, can alter the impulses to give into temptations, in particular with a high construal mindset. Thinking of events in high construal terms (abstract and subjective) can lead to higher self-control than in low construal terms (concrete). I set out to test if a high mental construal can improve self-control in cheating settings, and to determine which individuals it benefits the greatest. This was determined by measuring individuals natural tendency to construe events in high or low terms then assess their natural inhibitory control (measuring self-control) before experimentally manipulating them into high or low construal conditions. The dependent measure was whether participants cheated or not on a novel dice task. The results suggest that there was a marginal effect of construal condition on the decision to cheat. Participants in the lower-construal level was predictive of cheating behavior. Additionally, results marginally suggest participants that naturally construed events in low terms were impacted more by the construal manipulation.

*Keywords:* Self-control, construal level, cheating, inhibition

## Construal Level Effects on Self-Control in Cheating Contexts

Testing whether self-control in cheating contexts is affected by construal level has many important implications. For some students, not peeking over at a friend's test that they did not study for can be a temptation so real that they give in, resulting in a short-lived college career. But what if, while contemplating cheating during the test, they thought about their higher-level purpose? Maybe then they would realize that cheating would result in getting kicked out of college and decide to fail the test rather than risk getting kicked out. Additionally, in which individuals is this intervention most effective in stopping cheating behavior? The research in the present study is focused around the individual differences that can contribute to self-control failures. With the individual differences in self-control and cheating identified, interventions can be developed to help counteract the impulses individuals face that lead to goal failure.

Goals are attained through actions across varied social contexts over time that can be challenging when given a temptation in the moment (Fujita & Carnevale, 2012). "Self-control enables a person to override one response, therefore making another response possible" (Baumeister, Vohs & Tice, 2007), allowing the goal to remain on track. When faced with a temptation in the moment, one's brain uses several processes to make a decision to act on the temptation, including how to mentally represent the behavior, either as low (concrete) or high (abstract) construal. Construal representation differs between people and within the same person across different contexts (Fujita & Carnevale, 2012).

Self-control has many different contexts, one of the least researched being the exertion of self-control in cheating contexts. I propose the effectiveness of construal-level in preventing cheating during self-control contexts differs to the degree of their natural inhibitory control and natural construal and that persons with high construal will exert higher self-control. I evaluate

this claim by experimentally manipulating participants' construal level and measuring individual differences in inhibition and natural construal level. This was achieved by using a novel cheating task as a dependent measure of self-control.

## **Self-Control and Construal Level**

### **Construal Level**

Construal levels in relation to self-control have gained attention in social psychology in the recent decade, particularly with the advances made from the development of Construal Level Theory (CLT) by Trope and Liberman (2010). Construal level theory can be broken down into two parts: high and low level construal. High level construals are viewed as relatively abstract, coherent and superordinate representations, compared with lower level construal (Trope & Liberman, 2010). "The term "construal" refers to the process of representing an event and the outcome of this process; CLT focuses on this process" (Fujita & Carnevale, 2012). An example would be to use the word "book". The high construal representation of "book" could be "gaining knowledge," whereas the lower construal representation, which could be "words on a page." The fundamental difference between the two is how "book" is viewed. Gaining knowledge is the abstract view, as one does not gain knowledge strictly by looking at a book. "Words on a page" is a concrete and tangible representation of "book" because that is what is directly observe in books.

These differing descriptions of the same item bring about noticeably different judgments that inevitably affect the decisions regarding how to act on the behavior. Thinking of eating a piece of cake as "yummy" (low-level) focuses on the instant gratification one receives from eating it, which mostly creates a situation where ones eats the piece of cake to satisfy the craving. Conversely, thinking of the piece of cake as ruining a diet (high-level) creates a

situation where one is less likely to give into the craving because the cake is seen as ruining a goal, such as dieting. The same event of “eating cake” was construed in different ways and therefore created quite different outcomes.

## **Self-Control**

Self-control conflicts occur when a temptation sparks an impulse (Fujita & Han, 2009). In order to successfully override the temptations, a conscious effort must be made. Understanding self-control aspects helps increase appreciation for the nature and functions of the self; and can also help in comprehending how inadequate self-control can lead to behavioral and/or impulse problems (Baumeister et al., 2007). Rather than responding to immediate impulses, one can exert self-control to avoid doing things that one will later regret. For example, if one wants to lose weight, one must override temptations to eat junk food and sit on the couch all day. Self-control would be *actively overriding* the temptation to eat chocolate cake and snack on an apple instead. Actively deciding to override a temptation is an important aspect of self-control that has rarely been examined, as will be discussed later.

Prior research has demonstrated that construal levels affect self-control, but no research has been done to specify for which self-control situations this holds true. An important form of self-control is cheating, given all the implications it has when self-control fails. Cheating as a form of self-control is a familiar concept in field research but not experimental research. Initial searches into cheating as the dependent measure in labs produced limited results. Several lab experiments used a dice task as a form of cheating (Diekmann, Przepiorka & Rauhut, 2015; Fischbacher & Föllmi-Heusi, 2013; Kroher & Wolbring, 2015). Researchers asked participants to roll a dice to see how much they would get paid for completing a questionnaire; the dependent measure of cheating was the average number reported across all subjects. Higher average

numbers indicated more instances of cheating across subjects (Fischbacher & Föllmi-Heusi, 2013). Researchers did not report if the participants were suspicious or if participants cheated on an individual basis. Lack of transparency if participants were suspicious in addition to self-control measures that did not actively measure overriding a temptation were major flaws that I aimed to correct in the current study.

### **Construal Level Enhancing Self-Control**

The prior research has found that higher level construal leads to better self-control (Fujita & Carnevale, 2012). The reasoning behind these findings can be linked to the fundamentals of high-level construal: thinking in broad, abstract terms. High level construal amplifies people's appreciation for the goal-relevant implications of their choices, therefore promoting self-control. Those who construe events in low level terms often focus the instant gratification they get, creating a situation where they fail to see the broader implication, therefore leading to self-control failures. Differing descriptions of the same item bring about dramatically different evaluative judgment, ultimately changing the behaviors that follow.

A study done by Fujita & Han (2009) demonstrated that a higher mental construal encourages individuals to correlate negative temptations in their lives with negative consequences; therefore, promoting self-control when faced with temptations. They tested this by first priming participants into low or high construal mindsets by asking "how" or "why" questions respectively, and then assessing the degree to which they associated eating a candy bar as a negative action. Those in the high construal condition assessed eating a candy bar as a negative action more often than those in the low construal condition. Individuals with a high level mental construal consider how their choices will impact long term goals, whereas the low level mental construal are more likely to satisfy their instant gratification needs, leading to self-

control failure. Cheating on the test now to avoid a bad grade (instant gratification knowing one won't fail) is not as beneficial to long term well-being as remembering that getting kicked out of college (long term outcome) could derail the career goals one has for themselves. The first hypothesis aims to test these claims: *1) Inducing a high-construal level will cause individuals to cheat less on the self-control task.*

No prior research into construal levels and self-control has looked into which individuals are affected most by high-construal levels. In fact, there is little research examining individual differences in self-control. My aim is to measure individual differences between participants to see if inherent levels of inhibition (measured through stroop) and construal (measured through the Behavioral Identification Form) play a role in self-control interventions. The second and third hypotheses aim to test these claims: *2) Individuals with naturally high inhibitory control will have a smaller effect of the manipulation on cheating and 3) individuals who naturally construe events in higher level terms will have a smaller effect of the manipulation on cheating.*

### **Limitations of Prior Research**

Past research has mainly been concerned with increasing self-control levels and replenishing possible ego depletion, namely when self-control is overworked (Baumeister, 2002). Prior research has attempted to examine self-control in various ways. However, there are concerns that past measures of self-control may have validity issues. In an experimental study conducted by Schmeichel and Vohs (2009), they used a few types of measures to test self-control performance. One self-control measure administered was a cold-water test to see how long participants could hold their hand under water. It is not entirely clear that this task measures self-control. Common knowledge suggests that individuals have varying tolerance to cold temperatures but cold-water tolerance is unlikely to be correlated with self-control. A second

measure Schmeichel and Vohs (2009) employed was persistence on an impossible puzzle task. Individuals were not informed that there was no solution or how long they had to complete the puzzle. This may be a defective way of measuring self-control, however, because there is no temptation for participants to override; rather, it measured their level of persistence.

In a separate study conducted by Trope, Fujita, Liberman and Levin-Sagi (2006), a handgrip test was administered as the self-control measure. Those who could grip the toggle stick longest were determined to have the highest self-control. This measure of self-control is problematic because individuals have varying degrees of strength, and strength is unlikely to be correlate with high self-control levels. Self-control allows an individual to restrain a dominant response in order to make a different response (i.e. they must override a temptation) (Baumeister et al. 2007).

### **The Current Study**

The main goal of this study was to see how construal level representation affects self-control in cheating contexts. This goal could be broken down into two aims: a) *manipulate construal levels to test if construal levels improve self-control in cheating contexts* and b) *determine if individual differences in inhibitory control and natural construal level will enhance or minimize the effect of the manipulation*. In addition to addressing these aims, I tried to overcome some of the limitations mentioned above. The primary focus was to find an appropriate cheating self-control task that measured individual levels of cheating to test if construal levels affect self-control. The order of the procedure can be found in Figure 1.

To test for individual differences, participants were given a Behavioral Identification Form (Vallacher & Wegner, 1989) to access their natural tendency to construe events in high or low terms, and then the Stroop task to test their inhibitory control (Cothran & Larsen, 2008).



Next, participants were randomly manipulated into low and high construal levels using a series of “how” or “why” questions respectively.

In order to test if the manipulation indeed does affect self-control, some researchers used developed a dice task (Fischbacher & Föllmi-Heusi, 2013) that would give participants the opportunity to cheat under the cover of a pilot test. In the current study, this task was modified in the following way. Specifically, the participant was asked to guess 36 separate dice rolls on the computer, giving them an opportunity to cheat when they write down if they got the prediction correct or not. Participants were incentivized to cheat with the opportunity to win a \$100 Amazon gift card if they got 7 rolls correct, which was impossible without cheating because the program was designed to only allowed 6 correct predictions. Participants were also given a survey afterwards to assess how much they enjoyed the dice game. Lastly, a demographics survey was administered which included a question asking the participants to guess the purpose of the experiment in order to exclude participants who guessed the hypothesis correctly.

Figure 1:



This current study used a novel cheating task to measure self-control while also measuring multiple individual differences (natural tendency to construe events in high or low terms and inhibitory control) to test if participants were affected differently by the construal manipulation. The predictions are as follows:

1. Participants in the lower-construal level condition will cheat more on the cheating dice task than those in the higher-construal level condition.

2. Participants with naturally high inhibitory control, as measured by the stroop task, will not be as affected by the manipulation as those who have low inhibitory control.
3. Participants that naturally construe events in high level terms, as measured by the Behavioral Identification Form, will not be as affected by the manipulation as those who naturally construe events in low level terms.

## Method

### Participants

Fifty-two participants (26 male, 26 female) were recruited from the human subject pool, from the Department of Psychology and Neuroscience at the University of Colorado Boulder. The participants received course credit towards an assignment required for an Introduction to Psychology course. The research was approved by the University of Colorado Boulder Institutional Review Board. Participants provided written informed consent before the experiment began.

Participants were randomly assigned to High Construal Level or Low Construal Level conditions. The first ten participants were randomly assigned into the two conditions using a random order generator. This random assignment repeated for each subsequent ten participants. The experimenter was blind to what condition the participant was in.

Five participants were removed for reasons described at the end of this section. The *a priori* exclusion criteria were as follows:

- Suspicious or close guess to hypothesis (cheating, ethics, morals, honesty, etc.)
- Computer malfunctions that interfered with the completion of a task (n=2)

- Non-native English speakers
- Not following how/why instructions during the construal level manipulation
  - Why (high-level construal) condition must include abstract ideas or actions, long term implications, generally theoretical by the final question (n=1)
  - How (low-level construal) condition must include concrete plans or actions, short term outcome, generally methodical by the final question (n=2)

Two researchers independently coded the construal level manipulation based on the exclusion criteria described above with 100% agreement. The exclusion criteria applied to five students, two from the why condition, three from the how condition. After the excluded participants, there were 47 (22 male, 25 female) usable datasets. Two participants were excluded due to computer malfunctions. The remaining three participants were excluded because they did not meet the construal manipulation criteria.

## **Materials and Procedure**

Participants completed a total of six tasks. Refer back to Figure 1. Each participant was tested individually in a single one-hour session. The experimenter was on the other side of the room from the participant behind a divider for the duration of the experiment except for the two computer tasks. The experimenter read from a script verbatim to ensure all participants heard the exact same instructions. The two experimenters were both female, in their early 20's and roughly the same height. The experiments rehearsed together before running participants to ensure they delivered the instructions in the same manner. Rehearsing the delivery of instructions for the dice

cheating task meant using the same volume, gestures and level of excitement in order to ensure the participant wasn't influenced by the experimenter's presence.

The series of tasks is as follows:

**Behavioral Identification Form.** The first questionnaire assessed the participant's natural tendency to be construe events in high or low level terms. There were 25 multiple choice questions, with options A or B. The answers were randomized so A was partially high construal and partially low construal. See example below.

-Making a list

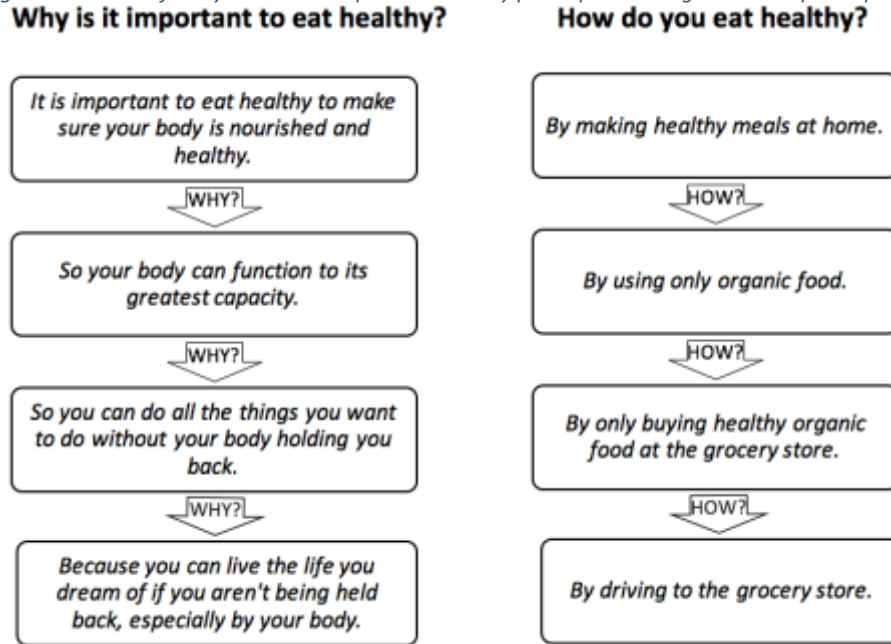
- a) Getting organized
- b) Writing things down

In this example, "getting organized" would be the high construal level answer because it is an abstract rather than concrete representation of making a list. (See Appendix A for full list of questions and instructions).

**Construal level manipulation task.** The purpose of the construal level task is to manipulate participants into a high or low level construal mindset before presenting them with a task that induces cheating. Participants were given a folder. The folder was given to participants in order to ensure that the experimenter was blind to what condition the participant was in. In this folder, they had instructions on how to complete the task, an example of a completed "how" or "why" question and then the task itself. The task had eight separate "how" or "why" questions for the participants to answer. Participants were randomly assigned to either low-level or high-level construal conditions. They were asked to answer in complete sentences "how" or "why" for a total of four times to a series of questions to induce the desired mindset, low or high level construal respectively. By the time the task was completed, participants had filled out a total of

32 “how” or “why” boxes (see Appendix B for full list of the “how” and “why” questions asked). See figure 2 below for an example from participants of “why” and “how”.

Figure 2. Format of “why” and “how” question seen by participants along with example responses.



**Stroop task.** The Stroop task was used to measure reaction time and inhibitory responses. In the Stroop task, participants were sitting in front of a computer with a pair of headphones. Participants were instructed to verbally name the color of a stimulus presented on the computer screen as quickly and accurately as possible. First the participant completed five practice trials containing colored strings of asterisks consisting of blue, red and green. Their instruction was to name the color of the asterisk as quickly and accurately as possible. Following the practice trials, the participants completed a baseline of forty colored strings of asterisks. After the baseline, participants received additional instructions on how to complete the remainder of the task. For the remainder of the task, they would see words in addition to the asterisks but the words would never be presented in the corresponding color. For example, the word “blue” would be presented in a red text, which is called an incongruent trial. Participants were instructed to simply name the display color and to ignore the meaning of the word. The asterisks presented in

blue, red and green were the congruent trials. After the baseline, there were four blocks of 40 consisting of both congruent and incongruent trials. The trial was considered correct if they named the display color and did not read the word. The computer recorded their reaction time.

**Dice task.** All participants completed the dice-rolling task. They were told that as a thank you for their help piloting this game, if they get over the expected average of 6 correct predictions, they will be entered into a raffle to win a \$100 Amazon gift card. Verbal instructions, computer instructions and the raffle sheet all emphasized to the participant that they would need to get seven or more correct predictions to be entered into the raffle. Participants see a prediction screen where they are instructed to click on the die face they think will pop up. Once they click the face, they write down their prediction on a raffle sheet provided to them. Then, a die will roll and they will hit the spacebar to stop the roll, giving them a sense of control over what number will pop up. In reality, the researchers programmed the dice task so no matter when the participant hit the spacebar, the same number would pop up according to the trial. If the participant picked the coded number, the program would change it to a different number so they would not get a match on trials other than the predetermined trials. The instructions that experimenters read to participants were as follows:

*“The 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 by rewarding them with gift cards, but as you can imagine, we have a limited budget. So, we decided to have one large prize instead of a lot of little ones. Those who can correctly guess above the expected average will have the chance to win a \$100 Amazon gift card.*

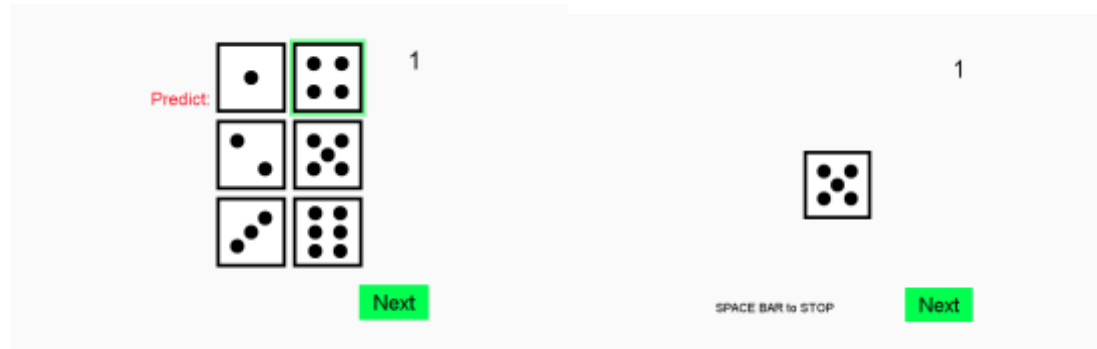
*There will be 36 dice rolls, so the expected average would be 6 correct roles. Therefore, if you can guess 7 or more correct dice rolls, you will be entered into the raffle.”*

Participants were asked to record if it was a “match” for a correct prediction or a “X” for a roll different than their prediction on a piece of paper. At this point, participants had the opportunity to change the their “X” to a “match” as to gain a larger chance to win the Amazon gift card. Participants first completed 3 practice rolls and then continued to complete 36 rolls. At the end of the task, participants were asked to tally up how many correct rolls they got and record at the bottom of the raffle page. The bottom says “\_\_\_\_/7” as a reminder they need seven or more correct roles to be entered into the raffle. Participants were also asked to check a box that says “No raffle” or “\$100 Amazon raffle.” Finally, they were asked to put their raffle sheet in the correct folder on a table behind them. The folders were labeled as “\$100 Amazon Raffle” or “NO Raffle.” Once they have put their raffle sheet in the appropriate folder, the researcher rejoined them on the other side of the room to complete the next task (see Appendix C for instruction sheet given to participant).

Figures 3a and 3b are two of the screens the participant saw. Figure 3a shows the prediction screen the participants saw where they were instructed to select a die face. The number they select is highlighted in green. Figure 3b shows the results screen after the die has stopped rolling.

Figure 3a. Prediction screen with selection highlighted

Figure 3b. Results screen after die rolls



**Dice survey.** Immediately following the dice task, there was an eight-question survey about the dice task in order to ensure that it appears to be a pilot study that needs feedback before running as its own experiment. It asked questions such as “this task was engaging” and “this task was confusing.” They ranked these questions using the 7-point Likert scale, with 1 being entirely disagree to 7 being entirely agree (see Appendix D for survey).

**Final questionnaire.** In this questionnaire, the participants were asked two questions: their age and gender. Then they are asked to guess what the overall purpose of the study was as to account for any biased results (see Appendix E for questionnaire).

Mild deception was used in this experiment concerning the purpose of the dice task. Participants were fully debriefed upon the completion of the experiment. The experimenter first verbally explained the deception used, why it was needed in order to answer the research question, and how to contact the researchers if they had any questions. They were then given a debriefing form, which went into more depth than the verbal explanation of the deception used. The names and emails of the primary and principal investigators were given on the debriefing form so the participant can contact them with any questions, comments or concerns.

### **Preliminary Data Analysis**

**Behavioral Identification Form.** Participants were given a survey of 25 questions. One point was given to the higher construal level question and summed to get a score out of 25. The data ( $M=14.4$ ,  $SD=4.72$ ) shows that the average participant naturally thought of events in high construal terms. As predicted, there were no differences between conditions,  $t(45)=-0.3$ ,  $p=0.765$ ,  $d=0.087$ .

**Stroop.** The first four trials of each block were considered “warm-up trials” and thrown out before data analysis. The baseline and mixed blocks were first coded to show incorrect and



voice key error trials. A voice key was when the microphone picked up a response other than their first time saying the color. For example, a voice key occurs when the participant had to say “blue” more than once before the computer moved on to the next trial. A response was incorrect when the participant did not accurately name the color of the text on the screen. Once all trials were coded as correct, incorrect and voice-key errors, an accuracy score was calculated for both baseline and mixed blocks.

Next, researchers removed the incorrect and voice key trials. From there, the trials were separated into three categories: baseline reaction time, asterisks reaction time and incongruent reaction time. A fourth category, called the difference score, was then calculated using incongruent minus baseline reaction times. The difference score was used as “Stroop” in the logistic regression. All reaction times were in milliseconds. There were no differences between conditions.

**Cheating.** Participants were asked to sum their total “matched” trials and total it at the bottom. The researchers used this sum to code with dummy variables, 0 for those who did not meet the criteria of matching 7, and 1 for those that matched 7 or more times. Due to the small number of participants who cheated more than once (3 out of 47), researchers analyzed if participants cheated or not, rather than how many times they cheated.

**Dice task survey.** The first two questions were negatively framed, so they were reverse coded. Once the seven questions were coded to reflect higher scores as higher happiness, each participant’s responses were averaged. Overall, participants liked the dice task ( $M=5.02$ ,  $SD=0.90$ ).

**Logistic model.** A logistic regression was performed using R with five predictor variables: Behavioral Identification Form (BIF), stroop difference score, condition,

condition\*BIF, and condition\*stroop. For analysis purposes, the condition was coded as: low-level construal as -1, high-level construal as 1. However, R would only predict four variables at once. I believe it was because the cheating behavior was completely predicted using four variables, causing a fifth variable to have nothing to predict. This was combatted by running two models, each one analyzing a different interaction variable. The two models are as follows:

$$\text{Model 1: } Cheating = BIF + Stroop + Condition + Condition * Stroop$$

$$\text{Model 2: } Cheating = BIF + Stroop + Condition + Condition * BIF$$

The BIF and Stroop scores were standardized before running the regression analysis. The logistic regression models were used to determine if the predictions were supported, which can be found in the results section below.

## Results

The descriptive statistics for all tasks can be found in Table 1.

Table 1. Descriptive statistics.

	N	Mean	SD	Median	Range	Skew	Kurtosis
<b>Behavioral Identification Form</b>	47.00	14.40	4.72	14.00	(5-25)	0.36	-0.28
<b>Stroop</b>							
Baseline accuracy	47.00	0.99	0.04	1.00	(0.75-1)	-5.88	35.27
Mixed accuracy	47.00	0.98	0.03	0.99	(0.84-1)	-3.72	18.01
Baseline reaction time	47.00	595.86	1.03	607.89	(464.05-706.27)	-1.43	-2.53
Aestric reaction time	47.00	735.10	1.15	735.10	(544.57-1012.32)	-1.12	-1.88
Incongruent reaction time	47.00	765.09	1.16	765.09	(578.25-1107.65)	-1.14	-1.16
Difference score	47.00	1.28	1.12	1.28	(1.01-1.58)	1.13	-2.69
<b>Cheating</b>	47.00	0.17	0.38	0.00	(0-1)	1.17	0.91
<b>Dice questionnaire</b>	47.00	5.02	0.90	5.00	(3.29-6.71)	-0.13	15.00

The first prediction was: *participants in the lower-construal condition will cheat more on the self-control dice task than those in the higher-level condition*, which researchers analyzed using a chi-square test. Results were in line with the prediction, with more participants cheating in the low-construal condition, with marginal significance. Participants cheating did vary by construal level condition,  $\chi^2(1, N = 47) = 3.08, p = .07$ . See Table 2 for complete

contingency table. The results of the logistic regression, which can be found in Table 3, indicate that condition was marginally predictive of if the participant would cheat or not in Model 1,  $\beta = -0.96$ ,  $SD=0.58$ ,  $p=0.09$ . It just missed marginal significance in Model 2,  $p=.11$ . Participants in the low construal condition were more likely to cheat, although this result was not statistically significant.

Table 2. Contingency table for condition and cheating

	Cheated	Not cheated	Marginal Row Totals
Low-Level Construal (how)	6	16	22
High-Level Construal (why)	2	23	25
Marginal Column Totals	8	39	47 (Grand Total)

The last two predictions were analyzed using logistic regression. Results can be found in Table 3. The first prediction analyzed with this model was: *participants with naturally high inhibitory control, as measured by the Stroop task, will not be as affected by the manipulation as those who have low inhibitory control*, which were analyzed using Model 1. Results showed that the prediction was not supported. Participants with low and high inhibitory control will be affected by the manipulation to the same degree,  $\beta=1.02$ ,  $SD=0.69$ ,  $p=0.14$ .

Table 3. Logistic regression results for models 1 and 2

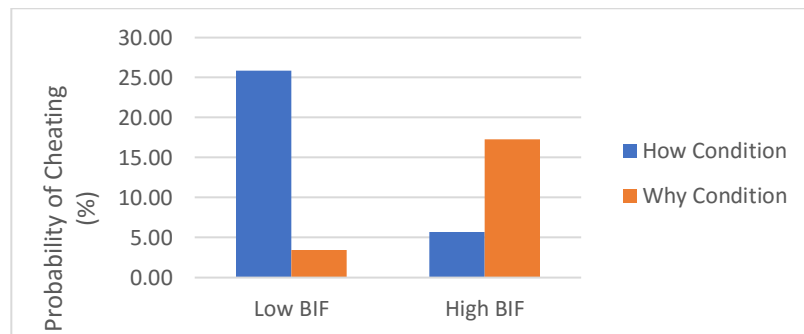
	Model 1				Model 2			
	B (se)	2.5% OR	Odds Ratio	97.5% OR	B (se)	2.5% OR	Odds Ratio	97.5% OR
Intercept	(-1.93) (.60)	0.02	0.14	0.32	(-2.19) (.68)	0.02	0.11	0.32
Condition	<b>(-.96) (.58)</b>	0.05	0.38	0.96	(-1.12) (.68)	0.05	0.33	0.96
BIF	.49 (.45)	0.57	1.63	3.15	.59 (.48)	0.74	1.80	5.57
Stroop	.73 (.67)	0.74	2.09	5.57	.27 (.42)	0.57	1.31	3.15
BIF*condition					<b>.88 (.49)</b>	1.00	2.41	7.62
Stroop*condition	<b>1.02 (.69)</b>	1.00	2.76	7.62				

Note: Bold text indicates a marginally statistically significant result,  $p<0.10$ .

The final prediction was: *individuals that naturally construe events in higher level terms will have a smaller effect of the manipulation on cheating*, which researchers analyzed using

logistic regression and can be found in Model 2. Results indicated that there was a marginal interaction between condition and the participant's natural tendency to construe events in high or low terms  $\beta=0.88$ ,  $SD=0.49$ ,  $p=0.07$ . This interaction is illustrated in Figure 4. Participants that scored low on the behavioral identification form and were in the lower construal level condition have a higher probability (25.86%) of cheating than those who scored high on the behavioral identification form. As illustrated in Figure 4, the lowest probability of cheating came from those who naturally construe events in low level terms who also received the high construal intervention, whereas those who did not receive the intervention had the highest probability of cheating.

Figure 4. Probability of cheating based on condition and BIF score. Low BIF is one SD below average and high BIF is one SD above average



## Discussion

The two aims of this study were to a) *manipulate construal levels to test if construal levels improve self-control in cheating contexts* and b) *determine if individual differences in inhibitory control and natural construal level will enhance or minimize the effect of the manipulation*. The first aim had marginal evidence supporting that those in the high-level construal condition were less likely to cheat than those in the low-construal level condition. The second aim was partially supported. The analysis showed that natural tendency to construe events had a marginal effect on if participants were more or less affected by the construal

manipulation, but not their natural inhibitory control. Participants who naturally construe events in low-level terms were affected greater by the manipulation than those who naturally construe events in high-level terms. Participants who naturally construe events in low-level terms and were in the low-construal condition were most likely to cheat.

### **Implications for construal manipulation main effect.**

The current study was one of few empirical attempts at testing construal levels as an intervention to decrease cheating behavior. The results suggested that construing events in high level terms decreased cheating behavior at a marginal level. This finding is in line with previous research (Fujita & Han, 2009; Fujita & Roberts, 2010; Trope et al., 2006). For example, Trope et al. (2006) found that participants primed to a high-construal mindset displayed greater self-control, physical endurance in this case, than those primed to use low-level construal. Although the evidence that high levels of construal affect behaviors relevant to self-control, particularly cheating, it was only marginally supported.

There are several reasons why the results showed only marginal significance. Because the self-control cheating task was a novel one, there was no prior research to indicate the reliability and validity as a self-control measure. The findings from the current study may differ from previous CLT and self-control study due to methodical issues regarding the self-control cheating task.

Additionally, the construal manipulation may not have effectively induced the construal mindset to the point where they continually thought in that mindset for the duration of the dice cheating task. The participants were given eight questions, which approximately took 10 minutes to complete. It is possible that prior research gave a longer period and was able to induce them into the construal mindset to a greater extent than we were able to. Additionally, the questions

themselves may not have effectively asked them in a way that promotes low or high level construal mindsets.

Another possible reason that the current study findings only marginally supported the effect of construal level on self-control is that previous studies also had a small sample size. As with any small sample, it is unclear whether the results occurred by chance or out of actual significance. While the chances are slim (5%), it is possible they detected a false positive. Conversely, we had a small sample size that may have not picked up on the full statistical significance of the effect.

### **Implications for individual differences in natural construal level and inhibitory control.**

This was the first empirical research testing individual differences that may play a role in construal level and self-control. The current study provided limited evidence that a high-level construal mindset reduced cheating most for those who naturally construe events in low-level terms. This finding means that those who naturally construe events in low-level terms will benefit the most from a high-level priming before being presented with a temptation to cheat. Interventions to stop cheating behavior are most effective when individuals change their mindset to abstract thoughts before and while the temptation is presented. However, given that the results showed only marginal significance; it is important that further research is conducted. As with the previous aim, a larger sample would easily clarify the significance of this finding.

There was no evidence to support the claim that the manipulation has a greater effect on those with naturally low inhibitory control. Thus, thinking in a high-level construal mindset is just as effective for people with naturally high self-control as it is for people with naturally low self-control. This finding implies that thinking in a high construal level will improve self-control,

regardless of how effective natural self-control is. While the hypothesis was not supported, it is important to remember this finding means that a larger group of people could be positively impacted by thinking in a high construal terms.

### **Limitations and Future Directions**

**Limitations.** It is important to remember that this was a small study conducted on a small scale and the results should not be interpreted as a lack of evidence supporting construal level manipulation as an effective intervention for cheating behavior. It is evident that there needs to be further testing to examine the relationship between cheating behavior and construal levels. In this regard, we acknowledge limitations to the study and how to possibly address them in future studies.

First, the current study was conducted with a small sample size. Since the results showed marginal significance, I believe that with an increased sample, the effect would have been amplified, leading to a significant result. Data collection was limited to a two-month span, severely limiting the number of participants run given the two researchers conducting the experiment.

Secondly, the cheating task was a novel one. There was no prior research to see the effectiveness of inducing cheating through the dice task. The lack of prior research meant that the task may be more effective in eliciting cheating behavior with subtle changes that are currently unknown to researchers. To address this in the future, changes to the program can be made from suggestions researchers collected on the dice survey. The last question on the survey asked for suggestions to make the task more engaging and fun.

In addition to making the task more engaging, further research needs to be done into how incentivized participants need to be in order to cheat. The participants were incentivized to cheat

with the possibility of winning a \$100 Amazon gift card. Initial pilot testing indicated that participants would have been more inclined to cheat with a larger incentive. I was unable to create a larger incentive for the current study due to limited resources for conducting the experiment.

Lastly, the results had a small number of subjects that cheated in the first place which is closely tied to the limitation of the novel dice task. Due to the small number of participants who actually cheated, analysis was difficult to put into one model. By addressing the novel dice cheating task, we hope that cheating frequency would increase, providing a larger sample to analyze. The small number of participants who cheated created a hurdle when running the logistic regression. Due to the small set of data, two separate models had to be created to predict cheating behavior with the five variables we were interested in.

**Future Directions.** The results from the current study had promising results, but there must be further modifications before it can be determined if construal levels are an effective intervention for cheating behavior. Specifically, a screening of the participant's attitudes towards cheating and immoral behavior may be an important individual difference in determining the effectiveness of construal interventions. Since cheating is seen as an immoral behavior, it would be natural to assume that those who hold themselves to higher moral standards would not be affected by the manipulation because they would not cheat in the first place. Whereas if one's attitude towards cheating is dependent on why they are doing it, the manipulation might have a larger impact.

Additionally, future directions could look into what type of construal manipulations are most effective. While the most common form of priming individuals into a certain construal mindset is by asking them "how" or "why" questions like we did in this current study, it would



be interesting to see if other priming techniques are more effective for stopping cheating behavior. For example, Fujita et al. (2006) presented subjects with 40 words. In the high-level condition, they were asked to generate superordinate labels by answering, “\_\_\_ is an example of what?” where the low-level condition was asked to produce subordinate labels by answering, “An example of \_\_\_ is what?” While both strategies have been scientifically proven to induce the desired mind effect, one more be more effective in cheating context than others.

### **Conclusion**

The current study provides limited evidence for previous research demonstrating that high construal level can improve self-control. There was marginally significant support for the effect of high construal level on improving self-control in cheating contexts. Furthermore, the evidence marginally supports that the high construal manipulation was more effective in reducing cheating for those that naturally construe events in low level terms. There was no evidence to support a difference between those with naturally high inhibitory control and low inhibitory control in regards to the effectiveness of the manipulation. The findings of the current study have implications in the interventions of cheating behavior, particularly for those who naturally construe events in low level terms. Future studies will benefit from further research into the novel dice task this study used. Further research is vital to understanding the role of construal level in cheating behavior.

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## Appendix A

### *Behavior Identification Form*

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
  - a) sitting in a chair
  - b) 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
  - a) Getting organized
  - b) Writing things down
2. Reading
  - a) Following lines of print
  - b) Gaining knowledge
3. Joining the Army

- a) Helping the Nation's defense
- b) Signing up
- 4. Washing clothes
  - a) Removing odors from clothes
  - b) Putting clothes into the machine
- 5. Picking an apple e
  - a) Getting something to eat
  - b) Pulling an apple off a branch
- 6. Chopping down a tree
  - a) Wielding an axe
  - b) Getting firewood
- 7. Measuring a room for carpeting
  - a) Getting ready to remodel
  - b) Using a yardstick
- 8. Cleaning the house
  - a) Showing one's cleanliness
  - b) Vacuuming the floor
- 9. Painting a room
  - a) Applying brush strokes
  - b) Making the room look fresh
- 10. Paying the rent
  - a) Maintaining a place to live
  - b) Writing a check
- 11. Caring for houseplants
  - a) Watering plants

- b) Making the room look nice
- 12. Locking a door
  - a) Putting a key in the lock
  - b) Securing the house
- 13. Voting
  - a) Influencing the election
  - b) Marking a ballot
- 14. Climbing a tree
  - a) Getting a good view
  - b) Holding onto branches
- 15. Filling out a personality test
  - a) Answering questions
  - b) Revealing what you're like
- 16. Tooth brushing
  - a) Preventing tooth decay
  - b) Moving a brush around in one's mouth
- 17. Taking a test
  - a) Answering questions
  - b) Showing one's knowledge
- 18. Greeting someone
  - a) Saying hello
  - b) Showing friendliness
- 19. Resisting temptation
  - a) Saying "no"
  - b) Showing moral courage

20. Eating
  - a) Getting nutrition
  - b) Chewing and swallowing
21. Growing a garden
  - a) Planting seeds
  - b) Getting fresh vegetables
22. Traveling by car
  - a) Following a map
  - b) Seeing countryside
23. Having a cavity filled
  - a) Protecting your teeth
  - b) Going to the dentist
24. Talking to a child
  - a) Teaching a child something
  - b) Using simple words
25. Pushing a doorbell
  - a) Moving a finger
  - b) Seeing if someone's home

## Appendix B

### *How Questions:*

1. How do you go about maintaining good health?
2. How do you about making sure you do well in school?
3. How do you go about setting a goal?
4. How do you go about communicating effectively?
5. How do you go about making sure you're happy?
6. How do you go about completing homework in a timely manner?
7. How do you go about avoiding procrastination?
8. How do you go about maintaining good hygiene?

### *Why Questions:*

1. Why is it important to maintain good health?
2. Why is it important to do well in school?
3. Why is it important to set goals?
4. Why is it important to communicate effectively?
5. Why is it important to be happy?
6. Why is it important to complete homework in a timely manner?
7. Why is it important to avoid procrastination?
8. Why is it important to maintain good hygiene?



**Appendix C**

*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 7 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	Prediction	Match or X
1. _____	_____	19. _____	_____
2. _____	_____	20. _____	_____
3. _____	_____	21. _____	_____
4. _____	_____	22. _____	_____
5. _____	_____	23. _____	_____
6. _____	_____	24. _____	_____
7. _____	_____	25. _____	_____
8. _____	_____	26. _____	_____
9. _____	_____	27. _____	_____
10. _____	_____	28. _____	_____
11. _____	_____	29. _____	_____
12. _____	_____	30. _____	_____
13. _____	_____	31. _____	_____
14. _____	_____	32. _____	_____
15. _____	_____	33. _____	_____
16. _____	_____	34. _____	_____
17. _____	_____	35. _____	_____
18. _____	_____	36. _____	_____

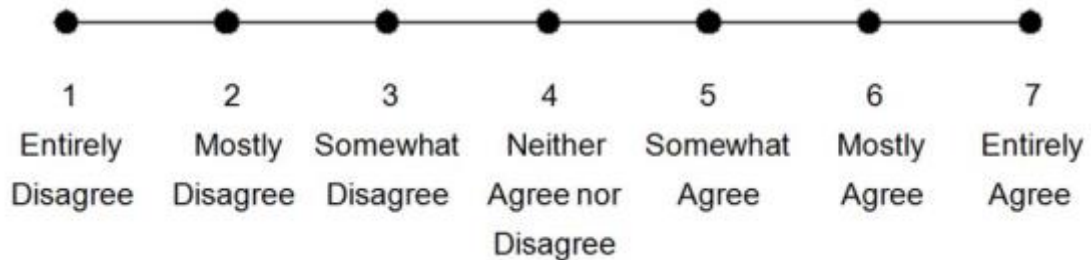
Number correct: \_\_\_\_\_/7

\$100 Amazon Raffle

No Raffle

**Appendix D***Dice Task Survey*

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



1. The task was fun.
2. The task was engaging.
3. The task was frustrating.
4. The task was pointless.
5. The duration of the task was too long.
6. The duration of each trial was too long.
7. The purpose of the task was confusing.
8. Please put any suggestions on how to make the game more fun or opinions in the box below:

## **Appendix E**

### *Final Questionnaire*

1. What is your age?
2. What is your gender?
3. Please write below what you think the study was analyzing.