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Neuroticism and Ego Depletion Patterns

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Neuroticism and Ego Depletion Patterns

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ABSTRACT

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Self-control has been defined as the ability to override or alter an automatic response. Past research has suggested that those who are higher in the personality trait neuroticism display poorer self-control. Based on theory suggesting that self-control is a limited resource, the present study attempts to explain the relationship between neuroticism and self-control. Understanding that neuroticism is characterized by emotional instability, it follows that individuals high in neuroticism must exert more self-control in managing their negative moods, thus leaving them depleted for future acts of self-control. Participants (n = 84) completed measures of trait self-control, engaged in an emotional regulation task, and then completed measures of state self-control, affect, and rumination. Results revealed no significant effect of emotional regulation on state self-control, nor a significant effect of neuroticism on state self-control. The implications of these findings are discussed.

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CHAPTER 1

INTRODUCTION

One crucial ability that humans possess is the capacity to override impulses and regulate

behavior; an ability that allows people to select more appropriate or beneficial courses of action.

This ability has arisen in many forms throughout the history of psychology being discussed in

terms such as inhibition (James, 2001), impulse control (Ainslie, 1975), willpower (Mischel,

1996), self-regulation (Bandura, 1991) and self-control (Muraven & Baumeister, 2000). The

conceptualization of self-control that the present study adopts is that put forth by Fujita (2011).

Specifically, self-control is conceptualized as the suppression of proximal motives in favor of

distal motives. In other words, self-control involves suppressing current impulses or desires that

conflict with future goals or aspirations.

Conceptualization and Review of Self-Control

Self-control is undoubtedly a vital skill. The ability to control reactions and regulate

behavior allows humans to pursue long-term goals, act in a societally acceptable manner, and

avoid the pitfalls of overindulgence. It is now fairly well documented that self-control is

associated with a number of behavioral, cognitive, and affective outcomes. High levels of self-

control have been associated with better grades, emotional adjustment, and interpersonal skills

(Tangney, Baumeister, & Boone, 2004). Other studies have found high self-control to be

indicative of better self-restraint (Muraven, Collins, & Neinhaus, 2002) and have even found

relationships between self-control and cognitive functioning (Schmeichel, Vohs, & Baumeister,

2003). Moreover, low levels of self-control are associated with poorer emotion regulation,

increased aggression, increased substance use, and other forms of risky behavior (Bruyneel,

Dewitte, Franses, & Dekimpe, 2009; Muraven & Baumeister, 2000; Wills & Stoolmiller, 2002).

In short, research is quickly revealing that self-control is extremely important in regulating

behavior and reaching goals.

Further research into self-control has also revealed that it is a limited resource (Muraven &

Baumeister, 2000). In other words, the overuse of self-control on one task may impair the ability

to exert self-control on subsequent tasks. The types of effortful activities that can deplete this

resource are varied (Hagger, Wood, Stiff, & Chatzisarantis, 2010). Self-control appears to be

depleted by any task that involves overriding an automatic or initial set of responses with an

alternate set of behaviors. For example, resisting tempting food (Baumeister, Bratslavsky,

Muraven, & Tice, 1998), engaging in effortful interactions (Vohs, Baumeister, & Ciarocco,

2005), and focusing attention (Schmeichel, Vohs, & Baumeister, 2003) are all instances in which

an individual must alter his or her thoughts or behaviors in order to produce a more appropriate

response and have all been shown to deplete finite self-control resources.

Emotion Regulation and Self-Control

Interestingly, and of particular relevance to the present study, are findings which suggest

that regulating one's emotional response is an activity that consumes self-control resources.

Muraven, Tice and Baumeister (1998) were among the first to directly test the effects of

emotional regulation on self-control resources. In this study, participants were split into three

groups: no emotion control, increase emotional response, and decrease emotional response.

Participants in the emotion regulation conditions were instructed to either increase or decrease

their emotional response and control facial expressions while viewing an emotionally upsetting

clip of suffering animals. Following the clip, participants completed a measure of fatigue as well

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as a measure of physical self-control, which involved squeezing a handgrip for as long as possible. Participants in the emotion regulation conditions reported a greater feelings of fatigue following the clip and had greater reductions in the time they spent holding the handgrip. The authors explain these findings by suggesting that emotion regulation requires self-control, which subsequently impaired participant's ability to persist on a task requiring physical stamina (Muraven et al., 1998). It is important to note that it was not the participant's physical stamina that was compromised. Rather, the participants in the suppression condition lacked the self-control strength to overcome the desire to give up on an unpleasant (handgrip) task.

In a similar study, Hofmann, Rauch, and Gawronski (2007) showed participants an emotionally charged clip from the movie "City of God". Participants in the depletion condition were instructed "to closely watch the clip but to remain completely neutral by suppressing any feelings that come up while watching" (p. 499). Following this emotion suppression task, participants were given an opportunity to taste M&M's. In the control condition, in which participants were not instructed to regulate their emotions, there was no association between automatic candy preferences and candy consumed. In contrast, among participants who had previously regulated their emotions, there was a positive association between automatic candy preferences and amount consumed. In other words, participants who had a preference for candy but had also regulated their emotions were the most likely to indulge in the candies. The authors explain these findings by suggesting that the emotion regulation task had depleted these participants self-control, making it more difficult for them to subsequently suppress the desire to eat candy.

Not only has emotion regulation been found to impair performance on subsequent physical (handgrip) or behavioral tasks (delay of gratification), but it has also been found to impair

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performance on cognitive tasks (Friese, Binder, Luechinger, Boesiger, & Rasch, 2013). In a fMRI study examining the neural correlates of self-control, participants were presented with a series of emotionally arousing images. Participants in the experimental group were instructed to suppress their emotional responses to these images, while participants in the control group were given no such instructions. After being presented with the emotional images, participants engaged in the Stroop task. Results revealed that participants in the suppression condition made significantly more errors on the incongruent trials as well as displayed greater Stroop interference scores (Friese et al., 2013). Moreover, results from the fMRI revealed that participants in the experimental condition (as compared to the control condition) displayed greater activity in the right lateral prefrontal cortex during the emotion suppression task, but subsequently displayed less activity in the right lateral prefrontal cortex during the Stroop task. Not only does this show that emotion regulation impairs performance on subsequent cognitive tasks, but it provides evidence for the neural basis of self-control.

Indeed, ample evidence exists supporting the notion that emotion regulation depletes self-control resources. Exemplifying this, a meta-analysis of self-control studies by Hagger et al. (2010) noted that emotion regulation tasks were commonly used as a means for depleting self-control. Out of the 83 articles reviewed, 24 of these studies used emotion regulation tasks as a means of depleting self-control. Typically, this took the form of having participants watch an emotionally arousing video while being instructed that they suppress all affective responses and control facial expressions.

Theoretical evidence for the link between emotion regulation and self-control has been presented in a review by Tice and Bratslavsky (2000). The authors begin by suggesting that, similar to other types of self-regulation, emotion regulation is made up of three components.

These include standards, monitoring, and strength. As people monitor their subjective state, they will compare their present state with the standards to which they hold themselves. When people realize that an emotion is inappropriate or unacceptable with respect to their standards, they must have the self-control strength to replace this emotion with a more appropriate one. This, of course, involves consciously and deliberately suppressing one response in favor of another. For example, a person who is trying to reduce anxiety may try to focus his or her attention on his or her breathing or heartrate or may try to focus on calming thoughts. In either case, the person had to push aside the dominant or automatic response (anxious thoughts) and replace it with a more beneficial one.

Furthermore, Tice and Bratslavsky (2000) note that unlike other activities that deplete self-control, emotion regulation can have a reciprocal relationship with self-control. Specifically, self-control failure can often result in negative affect, while at the same time negative affect can make failures of self-control more likely. For example, an excessively anxious person may consume a great deal of self-control resources in managing his or her anxiety and will thus show performance decrements on subsequent tasks requiring self-control (Kashdan, Weeks, & Savostyanova, 2011). This, in turn, may heighten anxiety and make future failures of self-control more likely to occur. This can create a cycle of negative affect and self-control failures that perpetuate one another.

Reasons Why Poor Mood May Lead to Poor Self-Control

It is important to note that there are a few potential explanations for why negative affect seems to impair self-control resources. One school of thought, which could be dubbed the "giving in to feeling good" position, suggests that negative affect leads to failures in self-control

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because distressed individuals are trying to make themselves feel better, and thus cave to desires. In order to study this Tice, Bratslavsky, and Baumeister (2001) conducted three studies. In these studies, participants read and emotionally disturbing passage and were asked to imagine themselves as the main character. This was intended to induce a negative emotional state. Following this, participants were either led to believe that their mood was unchangeable ("frozen") for a short period of time or they were left with the belief that engaging in some form of self-indulgent behavior would improve their mood. They were then presented with a task that required self-control (resisting food, delay of gratification, or resisting procrastination before a test). The results revealed that participants who thought their mood was unchangeable did not partake in the self-indulgent behavior. In contrast, those who believed their mood could be improved ate more food, were worse at delaying gratification, and procrastinated more. The authors take this as evidence suggesting "that people abandoned some forms of self-regulation only when doing so promised to make them feel better" (Tice et al., 2001, p. 64).

A second explanation for why negative affect leads to failures in self-control, and the one tested in the present studies, draws upon the limited resource model of self-control (Muraven & Baumeister, 2000). Specifically, it is hypothesized that individuals who are distressed are engaged in self-monitoring and self-regulation (i.e. attempts to cope with their negative mood), which consumes resources necessary for later acts of self-control. Indeed, as noted earlier, many studies have evidenced that self-control is depleted by emotion suppression tasks. Individuals who are distressed may put a great deal of effort into managing their negative emotions. For example, Uziel and Baumeister (2011) conducted two studies examining the personality trait neuroticism with respect to self-control. Participants were assigned to either a private or a social context. Participants then engaged in a depleting task followed by a test of state self-control

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(persistence on an unsolvable puzzle in study 1 and an anagram task in study 2). The results of both studies revealed that when in a social context, self-control was compromised for those higher in neuroticism. The authors explain these findings by suggesting that "the higher one scored in neuroticism the more likely one was to find the public social settings threatening and, as a result, to exert more self-control in regulating responses in this situation. As a result, little self-control strength was left to perform well on the subsequent task" (Uziel & Baumeister, 2011, p. 390).

Based on the evidence presented, it appears that there is some inconsistency among the explanations for why negative affect leads to failures in self-control. One position claims that negative affect produces failures in self-control simply because these individuals believe that engaging in certain self-indulgent behaviors will boost their mood. This could be dubbed the "giving in to feeling good" (Tice & Bratslavsky, 2000) position. A separate position posits that individuals experiencing negative affect are engaged in a great deal of self-monitoring and emotion suppression – activities that have been found to deplete self-control – which thus leaves little self-control available for subsequent tasks. Each of these theoretical positions would, of course, make different predictions about self-control depletion patterns. If the "giving in to feeling good" position is correct, then among distressed individuals we would expect to see more frequent self-control failures on tasks where self-control failure results in some sort of benefit (such as food or other type of immediate gratification). In contrast, if the second theory is correct, then we would expect to see equal levels of self-control failure across tasks, regardless of whether or not failure confers any type of benefit. It is also important to note that both of these theories could be true under diffferent circumstances. It is likely the case that in many circumstances, people do indulge in certain behaviors in order to make themselves feel better.

However, it could also be that in cases of extreme emotional strain, individuals really do lack the self-regulatory resources necessary to guide their behavior.

Keeping these theoretical distinctions in mind, the present study aims to examine how the personality trait neuroticism interacts with self-control depletion patterns. Neuroticism is a personality trait defined by the presence of worrisome or anxious thoughts (Eysenck, 1970) and is associated with a negative self-focus (Costa & McCrae, 1992). Often, neuroticism is also conceptualized as emotional instability or a proneness to stress, and is associated with a personal insecurity and depression (Judge & Bono, 2001). Importantly, those high in neuroticism share many traits in common with those low in self-control. For example, Renn, Allen, and Huning (2011) found that individuals high in neuroticism had difficulty with goal monitoring and goal operating. That is, individuals high in neuroticism were worse at monitoring their progress toward goals as well as translating their goals into actions. Moreover, the authors found that those higher in neuroticism were more emotionally self-absorbed as well as tended to procrastinate more. In other words, those high in neuroticism were excessively self-focused to the extent that it was counterproductive, leading to behavioral dysregulation.

In addition, the authors probed the relationship between neuroticism and goal monitoring and goal operating. This analysis revealed that emotional self-absorption and procrastination accounted for the effect of neuroticism on goal monitoring and goal operating (Renn et al., 2011). Simply put, the evidence suggests that those high in neuroticism experience excessive self-focus as well as tend to procrastinate more, which then causes them to fail at effective self-management. These findings were additionally supported by Tibbett and Ferrari (2015), who found that neuroticism significantly predicted procrastination.

Wallace and Newman (1997) also provide rationale for why neuroticism may be associated

with poor self-regulatory behavior. These authors argue that neuroticism essentially reflects an overactive automatic attentional orienting system. In order to properly carry out self-regulation, controlled processing (as opposed to automatic) is necessary. In this context, controlled processing refers to slow, effortful, calculating, and goal oriented information processing. In contrast, automatic processing refers to fast, effortless, and oftentimes crude information processing that is not directly under the subject's control. The crux of this argument is that as automatic processing increases, controlled processing decreases, and vice versa. In other words, there are a limited amount of attentional resources which can be utilized.

Furthermore, the authors note that an over-reliance on automatic processes will often lead to maladaptive cognitive, affective, and behavioral outcomes. These authors present evidence which suggests that individuals high in neuroticism are more likely to rely on the automatic attentional orienting system. For example, Derryberry and Reed (1994) found that both highly neurotic introverts and highly neurotic extraverts had an impaired ability to shift their attention away from either positively or negatively cued locations. This suggests that overall, those high in neuroticism have more trouble shifting attention. Indeed, this may be due to an over-reliance on automatic attentional orienting. Due to the fact that controlled processing is necessary for effective self-regulation, this means that highly neurotic individuals will be at a greater risk for self-regulatory failures.

Given the previous discussion, it is unsurprising that neuroticism has been found to have a robust negative correlation with trait self-control (r=-.40) (Tangney et al., 2004). While there appears to be a relationship between neuroticism and trait self-control, few studies have examined the relationship between neuroticism and state self-control following a depleting task. Relatively little is known about whether or not these individuals show difficulties on tasks of

state self-control, and what conditions might influence this. As noted previously, Uziel and Baumeister (2011) have conducted a few studies suggesting that working in a social context may impair performance among individuals higher in neuroticism. It is interesting to note that in the private context, neuroticism actually had a positive relationship with state self-control such that those higher in neuroticism persisted longer on an impossible puzzle and solved more anagrams. It appears, then, that this relationship between neuroticism and self-control only exists under a specific set of circumstances. Namely, in circumstances where prior emotion regulation was required.

Expanding on the notion that emotion regulation depletes self-control, the reason why those higher in neuroticism display lower trait self-control can be explained by the dual-motive model of self-control (Fujita, 2011). As noted, self-control is used when an individual must suppress proximal motives in favor of distal motives. Generally speaking, people in Westernized cultures (such as the United States) have the distal motive of displaying positive emotions (such as happiness, pride, love, etc.) (Eid & Diener, 2001). In Westernized cultures, displaying negative affect may have social consequences. For example, studies conducted in Westernized cultures have found that people who cannot effectively manage negative emotions (such as displaying anger or anxiety) are rated as less likable by their peers (Baker, Hudson, & Taylor, 2014; Cillessen & Mayeux, 2004). In short, not displaying negative emotions constitutes a standard by which individuals must monitor themselves. Following this self-monitoring, individuals must possess the self-control strength to overcome their (socially inappropriate) proximal motive to express emotion (such as behaving nervously) in favor of the distal motive (appearing positive and being accepted), thus constituting an act of self-control. It is likely that individuals higher in the personality trait neuroticism (which is characterized by anxious

thoughts and negative self-focus) must engage in a great deal of monitoring and emotion suppression, leaving them fatigued and less able to exert self-control on subsequent tasks.

Aims of The Present Study

As noted earlier, if negative affect produces failures in self-control as a result of ego-depletion, then we would expect to see failures in self-control regardless of whether failure provided some type of benefit. Indeed, this is what the findings from Uziel and Baumeister would suggest. The dependent measures of self-control in this study were persistence on an impossible puzzle and the number of anagrams solved. It is difficult to see how failure on either of these tasks would provide a boost in mood (as opposed to a test of self-control involving self-indulgence like resisting food). While it is certainly possible (likely, even) that distressed individuals sometimes fail at self-control because they believe certain self-indulgent activities will improve their mood, there is also evidence suggesting that in many cases the fatigue resulting from emotional self-regulation makes it more difficult for these individuals to regulate behavior on subsequent tasks. One major aim of the present study is to see if individuals higher in neuroticism will display lower levels of state self-control directly following an emotion regulation task. Furthermore, by using a dependent measure of self-control that should not be sensitive to self-indulgent motives, we will be able to tell if this effect exists due to legitimately depleted self-control resources, rather than just an increased motive for self-indulgent behavior.

A second aim of the present study is to examine the potential consequences of depleted self-control among individuals higher in neuroticism. As discussed earlier, Tice and Bratslavsky (2000) suggested that lacking self-control may place individuals at risk for subsequent failures in emotion regulation. This is because replacing an emotion with a different, incompatible emotion

requires self-monitoring and self-control strength. In other words, self-control is required to avoid anxious or negative thoughts. Individuals higher in neuroticism, who are prone to these negative cognitions to begin with, may lack the self-control strength necessary to keep these thoughts at bay following a depleting task. Supporting this, studies have found that low attentional control is associated with increased rumination and poorer thought suppression (Tortella-Feliu et al., 2014). Moreover, depleted individuals have reported greater test anxiety, likely due to the fact that they lacked the self-control strength to push aside anxious thoughts (Englert & Bertrams, 2013). Therefore, the present study also seeks to examine the effect of depleted self-control on rumination and affect among individuals higher in neuroticism.

Although it has been shown that neuroticism is associated with low trait self-control, few studies have examined neuroticism with respect to immediate depletion effects (state self-control). Uziel and Baumeister (2011) were among the first to do this. The present study seeks to conceptually replicate their findings. If neuroticism leads to more frequent failures in self-control as a result of ego depletion, then these effects should be apparent using a measure that is not sensitive to self-indulgent motives. If these effects do not appear, this may provide indirect evidence for the "giving in to feeling good" position. Finally, the present study seeks to examine some of the potential negative consequences of depleted self-control among individuals higher in neuroticism.

CHAPTER 2

METHODS

Participants

Participants were recruited from a public Southeastern university via Sona. In total, data was collected from 88 participants. However, 4 participants indicated that they did not want their data used, leaving a final sample of 84 participants. The majority of these participants were female (57%), had a mean age of 20 (SD = 3, min = 18, max = 36) and were predominantly white (74%). Of these, 36 were assigned to the control condition, while 48 were assigned to the experimental condition. Power analyses for the proposed project were conducted using GPower. Previous studies of self-control and emotion regulation have found that emotion suppression has an average effect size of d = 0.55 (Hagger et al. 2010). Based on this estimate of effect size, the present study needed 73 participants to obtain 95% power. With respect to the specific relationship between neuroticism and self-control, the two previous studies examining this (Uziel & Baumeister, 2012) found that neuroticism and condition interacted to predict state self-control (study 1: β = .42, $t(39)$ = 1.99, p = .05, p. 388)(study 2: β = –.45, t(39) = –2.20, p < .05, p. 390). Based on these studies, the regression coefficient f^2 was calculated to equal .102 for study 1 and .124 for study 2. By entering these values into GPower, it was estimated that to reach 80% power, 66 to 79 participants will be required. Therefore, it is assumed that the present study was adequately powered (at least 80%).

Materials

To assess neuroticism, the Big 5 Inventory (John, Donahue, & Kentle, 1991) was used. The Big 5 Inventory is a scale designed to assess five personality types: extraversion,

agreeableness, conscientiousness, neuroticism, and openness. There are 44 items and each item is scored on a 5 point scale. Higher scores on each subscale indicate more of that personality trait. The present study is particularly interested in the neuroticism subscale of the Big 5 Inventory. The neuroticism subscale of the Big 5 Inventory contains 8 items that assess neuroticism, meaning that neuroticism scores could range from 8 to 40. Scores on this scale were examined as a predictor for state self-control depletion following the manipulation. This scale exhibited good reliability in the present study (Chronbach's Alpha = .835) (Example item: Gets nervous easily).

To assess trait self-control, the Self-control Scale (Breif Version) (Tangney et al., 2004) was used. This scale contains 13 items, with each item being ranked on a 5 point scale. Lower scores indicate lower self-control. This scale showed acceptable reliability in the present study (Chronbach's Alpha = .789) (Example item: I am good at resisting temptation).

After completing these surveys, participants engaged in the self-control depletion task. This, of course, took the form of an emotion regulation task. The emotion regulation task used in this study was adapted from that used by Muraven, Tice, and Baumeister (1998). More specifically, participants were instructed to watch a video that depicts the abuse and mistreatment of pigs in a slaughterhouse. The video portrays gruesome scenes that are intended to elicit disgust from viewers. Suppression of disgust has been used to deplete self-control in previous studies (Martijn, Tenbult, Merckelbach, Dreezens, & de Vries, 2002; Wagstaff, 2014) and was appraised as being the most "uncontrollable" emotion (Mikulincer & Florian, 1997). Moreover, in a pilot study, participants reported great difficulty in suppressing their response to this video. Theoretically speaking, the more difficulty participants have in suppressing their emotions, the larger the effect will be in terms of self-control, thus increasing power (for a detailed discussion of why this video is being used, see appendix A). Participants in the experimental group were

told the following: "Once the experimenter leaves the room, click on the link and watch the short video. It is important that you give the video your full attention. The video may evoke an emotional reaction. If you experience any emotions while watching the video, try not to show them. In other words, try to behave in such a way that other people cannot see what you are feeling. This will involve controlling your facial expressions and body language. As soon as the video is finished, please ring the bell to notify the experimenter. If the video is too upsetting, please be aware that you can ring this bell and signal the experimenter to stop the video at any time you wish." Participants in the control group were told: "Once the experimenter leaves the room, click on the link and watch the short video. As soon as the video is finished, please ring the bell to notify the experimenter. If the video is too upsetting, please be aware that you can ring this bell and signal the experimenter to stop the video at any time you wish." Participants were video recorded during this portion of the study.

Immediately following the emotion regulation task, participants then completed the manipulation check. This is a self-report measure designed to assess the extent to which participants tried to suppress their emotion reaction. This consisted of one self-report item scored on a 7-point Likert scale (To what extent did you try to conceal your emotions when watching this video?).

In order to assess state self-control following the manipulation, the Stroop (Stroop, 1992) task was used. The Stroop task was chosen because it has been used as a dependent measure of self-control in previous studies of self-control (Hagger et al., 2010). The Stroop test works by having participants attempt to correctly identify the color of ink that a word is printed in. Some of these trials are congruent, meaning that the words are matched to their color (for example, GREEN printed in green ink). In contrast, some of these trials are incongruent, meaning that the

words are not matched to their color (for example, GREEN printed in red ink). In cases where the word and ink color are mismatched, the participant must override their automatic response to read the word –presumably an act of self-control– and properly identify the color of ink. Participants completed 200 trials using a computer program available in the Self and Relationships Lab. A Stroop interference score was calculated and used as a measure of state self-control. Stroop interference is the difference in the mean reaction times between congruent and incongruent trials. This is calculated by subtracting the mean reaction time on the incongruent trials from the mean reaction time on the congruent trials. Smaller Stroop interference scores indicate higher self-control, due to the fact that these participants were able to override their automatic response the quickest.

Following the test of state self-control, an adapted form of the Post Event Processing Questionnaire (Rachman, Grüter-Andrew, & Shafran, 2000) was used to assess rumination resulting from the task. The Post Event Processing Questionnaire is a scale that assesses the extent to which an individual ruminates following an event. This adapted scale consisted of 7 items. Items were scored using a visual analogue scale of 0-100. Scores closer to 700 suggest more post event processing. This scale exhibited acceptable reliability in the present study (Chronbach's Alpha = .863) (Example item: After the video was over, did you find yourself thinking about it a lot?).

Finally, the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988) was administered to participants. The Positive and Negative Affect Schedule is a 20-item survey designed to measure levels of positive and negative affect. Scores on this assessment can range from 10 to 50 for both positive and negative affect scores. A higher score on the positive affect items indicates more positive affect, whereas a higher score on the negative affect items indicates

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more negative affect. Both the subscales for the positive items (Chronbach's Alpha = .898) and the negative items (Chronbach's Alpha = .870) displayed acceptable reliability (Example item: ___distressed ___excited ___upset ___strong ___guilty).

Procedure

Participants began by completing the Big 5 Inventory (John et al., 1991) and the Self-control Scale (Tangney et al., 2004). Following these initial measures, participants were randomly assigned to either the experimental condition or the control condition. All participants, regardless of condition, viewed the emotionally arousing video clip. Participants in the experimental group, however, were asked to control their emotions and remain as emotionally neutral as possible by controlling their facial expressions and body language. This required participants to actively monitor their emotional states and modify them. In contrast, participants in the control group were not told to regulate their emotions. They were simply instructed to view the video clip.

Following the emotion regulaion task, participants completed the manipulation check. Next, participants completed the measure of state self-control -the Stroop task- on the computer. This consisted of completing 200 trials. Stroop interference was calculated by subtracting the mean reaction time on the incongruent trials from the mean reaction time on the congruent trials. Finally, participants completed the Post Event Processing Questionnaire (Rachman et al., 2000) and the PANAS (Watson et al., 1988).

CHAPTER 3

ANALYSIS

The present study examined several hypotheses. The first hypothesis was purely confirmatory in that it aimed to replicate previous findings regarding emotion regulation and self-control. Specifically, it was hypothesized that participants in the emotion suppression condition would display lower levels of state self-control than those in the control condition. This was tested for using a standard t-test. If significant, this will further support findings reported in previous self-control research (Hagger et al., 2010). Similarly, the second hypothesis was designed to further support previous findings regarding self-control and neuroticism (Uziel & Baumeister, 2012). Specifically, it was hypothesized that those higher in neuroticism would display greater depletion effects following an emotion regulation task. This was examined by regressing state self-control onto neuroticism, condition, and the neuroticism*condition interaction. The final hypothesis was designed to examine the possible consequences of depleted self-control for those higher in neuroticism. Therefore, it was hypothesized that those who have the lowest levels of state self-control would report heightened levels of negative affect and rumination. In order to test this hypothesis, a two-stage least squares regression analysis (2SLS) was proposed.

CHAPTER 4

RESULTS

Based on previous findings, it was expected that there would be a moderately sized

correlation between the personality trait neuroticism and trait self-control. This relationship was

found (r (82) = -.271, p = .013, see table 1), although somewhat smaller than previously noted.

Next, the manipulation check item was examined. If the emotion suppression manipulation was

effective, then we would expect participants in the experimental condition to report suppressing

their emotions to a greater degree. Specifically, this manipulation check item asked "to what

extent did you try to conceal you emotions?". Strangely, despite participants in the experimental

condition being explicitly told to suppress their emotional response, there was no significant

difference between groups on this item (t (82) = -.090, p = .929). Indeed, this is a critical factor

in the present study which could greatly influence subsequent results. However, while the self-

reported manipulation check did not reveal significant group differences, two trained coders did

watch the videos of the emotion suppression task and coded for 1) seconds of disgust and 2)

intensity of emotion (1-7 scale). The inter rater reliability for the seconds of disgust was .849,

while the inter rater reliability for intensity of emotion was .938. With regards to the seconds of

disgust shown, Levine's test for equality of variances was significant (F = 11.03, p = .001).

Assuming unequal variances, there was no significant difference in the seconds of disgust shown

(t(46) = 1.98, p = .054) between the control (M = 55.4) and experimental (M = 33.2) conditions.

Similarly, Levine's test for equality of variances was significant (F = 26.9, p < .000) for the

intensity of emotion shown. However, in this case there was a significant difference between the

intensity of emotion displayed (t(43) = 3.03, p = .004) between the control (M = 2.3) and

experimental (M = 1.2) conditions. This could suggest that participants did not differ in the

amount of time they showed emotion, but did differ in the intensity of that emotion.

Table 1

Correlations between Primary Variables of Interest

Variable	1	2	3	4	5	6
1. Trait Self-control						
2. State Self-control (Stroop)	-.044					
3. Neuroticism	-.271*	-.021				
4. Post Event Processing	.060	.237*	.045			
5. Positive Affect	-.047	-.223*	-.053	.009		
6. Negative Affect	.021	.101	.144	.596*	.036	

*p < .05

Table 2

Descriptive Statistics for Primary Variables of Interest

Variable	Mean	SD	Min	Max
1. Trait Self-control	41.45	7.86	26	62
2. State Self-control (Stroop)	200.04	96.75	-15.04	445.00
3. Neuroticism	24.02	6.78	8.00	39.00
4. Post Event Processing	16.81	8.02	6.00	37.00
5. Positive Affect	23.12	8.77	10.00	47.00
6. Negative Affect	17.90	7.33	10.00	39.00

Note: Descriptive statistics split by condition are in Appendix J

The goal of the first hypothesis was to replicate previous findings regarding self-control

depletion following an emotion suppression task. Specifically, it was hypothesized that those in

the emotion suppression (experimental) condition would have longer Stroop latencies. An

independent samples t-test revealed that there was no significant difference between the

experimental and control groups in terms of Stroop latencies (t (82) = .058, p = .954). Therefore, it can be concluded that the present study was unable to conceptually replicate previous findings regarding emotion suppression and self-control.

The goal of the second hypothesis was to examine the effect of neuroticism on the relationship between condition and depletion. Based on previous work (Uziel & Baumeister, 2012), it was expected that individuals higher in neuroticism would be more depleted by the emotion regulation task. In order to test this, state self-control was regressed onto neuroticism, condition, and the neuroticism*condition interaction. Neuroticism was mean centered prior to this analysis. Surprisingly, neither condition (B = -1.8, 95% CI = -45.11 – 41.519, p = .934) nor neuroticism (B = -.131, 95% CI = -3.5 – 2.87, p = .845) significantly predicted Stroop latencies. Furthermore, the neuroticism*condition interaction (B = 1.509, 95% CI = -4.9 – 7.92, p = .641) did not significantly predict Stroop latencies. Therefore, this study failed to find evidence for the the interactive effect of neuroticism and emotion regulation on self-control.

Table 3

Regression Analysis Results

Predicting State Self-control

Variable	B	SEB	Sig
Condition	-1.797	21.77	.934
Neuroticism	-.313	1.6	.845

R-squared = .001

Predicting State Self-control

Variable	B	SEB	Sig
ConditionXneuroticism	1.509	3.22	.641

R-squared Change = .003

The final hypothesis stated that individuals with the lowest self-control would experience the highest levels of rumination and negative affect following the video. The original analysis proposed using a two-stage least squares (2SLS) regression analysis, where the regression equation derived from regressing state self-control onto condition would be used to estimate state self-control, thereby directly estimating the explanatory variable. This was proposed due to the fact that directly estimating values for state self-control (as opposed to using the actual values) would remove the influence of confounds on the estimated (self-control) variable. However, due to the fact that condition did not significantly predict state self-control, estimated values could not be meaningfully generated. As such, the two-stage least squares analysis was abandoned.

However, the aim of the third hypothesis was merely to examine the effect of state self-control on subsequent affect and rumination. While a 2SLS analysis was unable to probe this hypothesis (due to the aforementioned constraints), there are other more rudimentary analyses that could probe this effect. Due to the fact that these analyses were not originally planned, they will have to be labeled as exploratory. Interestingly, the measure of state self-control (Stroop latencies) used in this study was significantly associated with measures of post-event processing and affect. There is a significant correlation between Stroop latencies and post event processing $(r (82) = .237, p = .030)$ as well as positive affect $(r (82) = -.223)$. In this way, it appears that those with longer Stroop latencies (indicating less self-control) tended to ruminate about the video more. In contrast, those with shorter Stroop latencies (indicating more self-control) tended to experience more positive affect.

CHAPTER 5

DISCUSSION

By and large, the present study was unable to replicate the depletion effect. Specifically, emotional self-regulation did not lead to impaired performance on the Stroop task. Moreover, the personality trait neuroticism did not predict greater susceptibility to self-control depletion effects. However, while the 2SLS analysis was unable to be conducted, exploratory analyses did suggest that those with longer Stroop latencies (indicating poorer self-control) experienced more rumination and less positive affect.

Needless to say, the results of this study leave more questions than answers. The first question is why the present study was unable to replicate previous research. Broadly, there are two potential explanations for this. The first explanation is that the present study employed a poor manipulation of emotional regulation, poor measurement of self-control, or both. The second (and somewhat more concerning) explanation is that the theoretical model from which these hypotheses were derived is incorrect. This could come in two forms. On one hand, it could be that the limited resource model of self-control is faulty, thus meaning that replication of ego depletion effects are unlikely to be found. On the other hand, the limited resource model of self-control could be correct, but emotional self-regulation is not among the activities that deplete this resource. Each of these possibilities will be carefully considered.

Assuming for the moment that the theoretical (limited resource model) basis for this study was sound, it is entirely possible (likely, even) that some practical aspect of the experimental design was flawed, leading to non-significant results. For example, the study could have employed a poor manipulation of emotional regulation, poor measurement of self-control, or both. The notion that this study employed a poor manipulation of emotion regulation is

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unavoidable. This is due to the fact that the manipulation check item, which was intended to assess the effectiveness of the manipulation, showed no group differences. There are a few potential explanations as to why this manipulation was ineffective.

<center>Manipulation Effectiveness</center>

The first possible explanation for the ineffective manipulation is non-compliance. It is possible that, despite receiving instructions to suppress their emotions, participants did not self-regulate. On the other hand, it is possible that the video manipulation caused individuals, even in the control group, to automatically self-regulate. In a certain sense, this could be considered over-compliance in that every participant engaged in emotional regulation, regardless of condition. This is a possibility that should be taken very seriously. Based on the video coding, it was found that in the experimental condition 30% of participants showed zero seconds of disgust. In the control condition, 42% of participants displayed zero seconds of disgust. Therefore, it is apparent that a large portion of participants in both groups did not display any emotion, thus washing out the effect of the manipulation. It seems that many participants, regardless of instructions, were regulating their emotions to some degree (or were simply unaffected by the video).

There is a body of evidence which suggests that rather than being effortful and controlled, a great deal of emotion regulation occurs automatically. Mauss, Bunge, and Gross (2007, p. 148) define automatic emotional regulation as a "change to any aspect of one's emotions without making a conscious decision to do so, without paying attention to the process of regulating one's emotions, and without engaging in deliberate control". Similar to deliberate or effortful emotional regulation, automatic emotion regulation is believed to operate through

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mechanisms such as situation modification, attentional deployment (such as distraction or rumination), cognitive change (reappraisal), and response modulation (such as decreasing emotion-expressive behavior) (Gross, 2008). Furthermore, there is evidence to suggest that people can become better at automatic emotional regulation with practice. For example, it has been demonstrated that individuals who were trained to reappraise negative images reported spontaneously regulating their negative emotions and greater use of reappraisal strategies at a two week follow-up (Christou-Champi, Farrow, & Webb, 2015).

Due to the fact that emotional regulation is a necessary skill in everyday life, it is likely that individuals have become especially good at automatically regulating undesired emotions. It could very well be that when participants viewed the upsetting video, their "knee-jerk" response was to engage in some form of emotion regulation (such as attentional deployment, cognitive change, or response modulation). Moreover, participants were aware of the fact that they would interact with the experimenter after the video, so they may have regulated their response in order to maintain their composure in front of the experimenter. Given that individuals have a tendency to automatically regulate their emotions, this could explain the lack of difference between the control and experimental groups on the manipulation check item. In other words, regardless of the instructions they received, participants may have automatically regulated their emotional response to the upsetting video, rendering the manipulation ineffective.

The fact that emotion regulation may occur automatically has implications in terms of its effect on self-control, as well. This is because, as noted, self-control involves an attempt to control or alter one's own responses (Muraven et al., 1998). If emotion regulation occurred as automatic, then it is by definition not an act of self-control. Indeed, people who are exceptionally skilled at automatic emotion regulation will not expend a great deal of effort in doing so.

Theoretically, if emotion regulation occurs as an automatic process then it should not require self-control.

Measurement of Self-Control

Setting aside the aforementioned limitations, there is still another possible explanation for why this study failed to replicate previous work. Specifically, it could be the case that this study employed poor measurement of state self-control. The standard argument for using the Stroop as a measure of self-control is that this task requires response inhibition. The automatic response is to read the letters, while the correct response is to name the color. Therefore, the Stroop task involves controlling or altering one's automatic response in favor of providing the correct response (i.e. self-control). Moreover, it could be argued that the Stroop task, unlike many tasks that require self-control (such as dieting or not procrastinating), is not influenced by individual differences in goals. When performing the Stroop task, everyone has the same goal. Therefore, it seems as though it would be easy to generalize across participants. Indeed, this is part of the reason the Stroop was selected in the present study. It fits an extremely simplistic definition of self-control (response inhibition) and is not sensitive to individual differences in goal pursuit.

However, these could be the very reasons that the Stroop is not a good measure of self-control. In the real world, self-control is not simply response inhibition, nor does everyone have the same goals. If we adopt a more developed definition of self-control, the Stroop task no longer appears to be a useful metric. Fujita (2011) has proposed a much more nuanced definition of self-control. In the dual-motive account of self-control, an individual faces a dilemma between two competing motivations. On one hand individuals have smaller, proximal motivations (such as spending money), while at the same time they have larger, more abstract motivations (such as

saving money). In such a case, self-control is the capacity that allows an individual to forgo the immediate temptation in favor of the long-term gain. If we try to map this description onto the Stroop task, we might be able to say that the proximal motive is to read the word, while the distal motive is to name the color. In order to achieve the distal motive, an individual must then override their proximal motive of reading the letters and instead name the color.

However, as Kurzban et al. (2013) point out, there is still an important aspect of goal pursuit that is missing from the Stroop task. This is the element of choice. When faced with competing proximal and distal motives, people have the opportunity to choose either one. There is no "correct" answer, per say. In contrast, the Stroop task does have a "correct" answer. Moreover, failure to provide the correct answer on the Stroop task does not result in any foreseeable benefit to the individual. In most situations where proximal and distal motives are competing, acting on the proximal motive (such as over-spending) does confer a benefit to the individual, even if it is fleeting. This means that the Stroop task is less about making cost-benefit analyses (proximal motives vs. distal motives) and more about racing to identify a correct response as quickly as possible.

As Kurzban et al. (2013) astutely note, the Stroop task merely elicits competition between the visual and word-processing systems. Although this competition between systems may still fatigue the participant, this is an entirely different system than that which is activated in cost-benefit analyses. Ultimately, it is argued that the parallels between the Stroop task and tasks of self-control are insufficient in that the Stroop task does not assess conscious deliberation over decisions. There is no decision making or cost-benefit analysis in the Stroop task; there is only a race for the one correct response. In short, the Stroop task lacks the element of choice that is so crucial in the dual-motive model of self-control, thus making it an inappropriate measure.

Limited Resource Model

In addition to the aforementioned explanations for why this study failed to replicate previous findings, there is still a more serious concern. This is the concern that the theoretical model from which the present hypotheses were derived is faulty. This could come in a few forms. First, the entire premise that self-control is a depletable resource (limited resource model) could be incorrect. On the other hand, the limited resource model may be correct, while the premise that emotional regulation is among the activities that deplete this resource is incorrect. Each of these possibilities will be considered in turn.

Recently, the limited resource model of self-control has been called into question. While there are a vast number of studies suggesting that self-control is a limited resource (Hagger et al. 2010), there is a growing body of evidence that does not support this position. For example, Carter et al. (2015) conducted a meta-analysis of ego depletion effects that included unpublished results. The results of this meta-analysis suggested that self-control depletion effects have been grossly over-estimated as a result of the publication bias, and that self-control does not in fact appear to be a limited resource. These findings have been further supported by a collaborative project coordinated by Hagger and Chatzisarantis (2015) through the Open Science Framework. This project had 23 different labs attempt to replicate previously reported findings regarding ego depletion. The vast majority of labs that participated in this study were unable to replicate ego depletion effects (with a few even finding opposite effects), causing the overall estimated effect of ego depletion to be essentially zero. These findings could suggest that self-control depletion is not as robust of a phenomenon as researchers once thought. If the limited resource model of self-

control is incorrect, or only exists under certain circumstances, then it is unsurprising that emotional regulation did not elicit depletion effects.

Of course, while the limited resource model of self-control has recently come under fire, there is still a distinct possibility that it is indeed correct. As has been discussed, there is a plethora of research suggesting that ego depletion does exist. However, even if the limited resource model of self-control is correct, the premise that emotional regulation is among the activities that depletes this resources could be incorrect. Although, given the theoretical underpinnings of the limited resource model, this seems unlikely. This is due to the fact that self-control, in the limited resource model, is defined as "an attempt to control or alter one's own responses" (Muraven et al., 1998, p. 774). Moreover, the authors go on to use emotional regulation as a prime example of an instance of self-control exertion. Therefore, this second possibility seems unlikely. Indeed, if the limited resource model and all of the assumptions within it are correct, then emotional regulation is necessarily an activity that would draw upon its resources.

To summarize, the present study may have failed to replicate previous findings for a number of reasons. First, this study may have employed a problematic manipulation of emotion regulation. While this could be due to non-compliance, it is also possible that participants in both conditions were in fact engaging in the emotion suppression task through largely automatic processes (or were simply unaffected by the video). After coding the videos, it became apparent that a large portion of participants in both conditions displayed little or no emotion at all, supporting this idea. Second, it is possible that the outcome measure of self-control that was used (Stroop task) is in fact not a valid measure of self-control, meaning that any group differences in self-control that did exist were undetectable. Third, the theoretical underpinnings from which the

hypotheses were derived (limited resource model) may have been incorrect. This is a real concern, given the fact that this field of study is currently under intense scrutiny. Future research and additional attempts to replicate prior work will be necessary in order to address this final concern.

Neuroticism and Self-Control

The goal of the second hypothesis was to examine the effect of neuroticism on state self-control. Specifically, it was expected that those higher in neuroticism would experience the greatest self-control depletion effects (as evidenced by Stroop latencies). This effect was not found. While there was a moderate correlation found between trait self-control and neuroticism (r (82) = -.271, p = .013), there was no moderating effect of neuroticism on state self-control. In fact, there was not even a significant correlation between neuroticism and state self-control (r (82) = -.021, p = .851). There are several potential reasons why this relationship was not found. First, it could be possible that there is legitimately no effect of neuroticism on state self-control. Second, there could be an effect of neuroticism on state self-control, but it works through mechanisms that were not manipulated or measured in this study. Finally, echoing one of the previously noted criticisms, it is possible that there is an effect of neuroticism on state self-control, but the dependent measure used for state self-control (Stroop task) was not sensitive to these effects. Each of these possibilities will be examined.

Robustness of the Effect

The first possible reason why no effect of neuroticism was found on state self-control is that there is in fact no effect. Simply put, those higher in neuroticism do not have compromised

self-control. However, given that plethora of evidence that suggests that those higher in neuroticism do have compromised self-control, this seems unlikely. For example, a negative correlation has been consistently found between neuroticism and trait self-control (Tangney et al., 2004; Uziel & Baumeister, 2011). Indeed, this correlation was found in both pilot studies and in the present study as well. Therefore, there is reason to believe that there is some relationship between neuroticism and self-control, at least at the trait level.

Interestingly, however, this relationship between neuroticism and self-control does not always appear at the state level. In fact, the opposite relationship has been observed. For example, Uziel and Baumeister (2011) note that neuroticism was associated with decreased state self-control after working in a public context, but was associated with increased state self-control after working alone. Given this, it seems that the demands of the situation may determine whether neuroticism is associated with increases or decreases in state self-control. Given that this and the present study are the only studies that have thus far examined the effect of neuroticism on state self-control, it is still largely unknown if there is any robust relationship between neuroticism and state self-control. Given the evidence that neuroticism is correlated with trait self-control, we might naturally assume that a similar relationship would appear when looking at state self-control. However, it is clear that more research is needed to determine whether this is the case.

<center>Mechanisms Behind the Effect</center>

There are still other explanations for why a relationship between neuroticism and state self-control was not observed in the present study. It could be the case that this relationship does exist, but the specific mechanisms through which this relationship operates were not probed in

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this study. This study relied on two assumptions about these mechanisms. First, this study relied on the assumption that the limited resource model of self-control was valid. Second, this study relied on the assumption that emotional regulation is one of the tasks which deplete self-control resources. Based on these assumptions, a hypothesis was derived which stated that, as a result of emotional regulation, those higher in neuroticism would lack the self-control resources (depletion) to effectively override their automatic responses to the Stroop task. The issues with both of these assumptions have been previously discussed, so they will not be discussed in detail again. However, it should be noted that if either of these assumptions are false, then the study design (which was based on these assumptions) may not have been sufficient to elicit the hypothesized changes in self-control.

For example, an alternative position states that individuals high in neuroticism fail as self-control not because they are depleted, but because they are emotionally self-absorbed which leads to ineffective goal setting, monitoring, and operating (Renn et al., 2011). If difficulties with goal setting, monitoring, and operating do explain the relationship between neuroticism and trait self-control, then the present study would likely not have been able to detect this. While the manipulation (video affect regulation) may have induced emotional self-absorption, the dependent measure (Stroop task) is completely insensitive to individual differences in goal pursuit. Therefore, if problems with goal pursuit do explain the relationship between neuroticism and low trait self-control, the Stroop task is not useful metric for probing this relationship. In order to assess decrements in self-control due to misregulated goal pursuit, a measure that is sensitive to individual differences in goal setting, monitoring, and operating would need to be used.

There is yet another alternative explanation for why neuroticism leads to poor self-control. This position was previously dubbed the "giving in to feeling good" position, and suggests that those who experience negative affect (such as individuals high in neuroticism) fail at self-control not because they are depleted, but because they are attempting to boost or repair their negative mood (Tice & Bratslavsky, 2000). Therefore, to accurately test this model, one would need to use a dependent measure of self-control in which failure confers some sort of short-term benefit to the participant. Although the manipulation used in this study may have effectively induced a negative mood, failure on the outcome measure of self-control (Stroop task) provided no foreseeable benefit to the individual. Therefore, the Stroop task cannot adequately assess the "giving in to feeling good" model. Only tests in which failure results in some form of short-term benefit could be used to assess this model. Future research should use measures of this nature to see whether an effect can be found.

In sum, the second hypothesis stated that those higher in neuroticism would experience greater decrements in self-control. This hypothesis was not supported. The first potential reason for this is that there is no real effect of neuroticism on state self-control. However, given the consistent relationship between trait self-control and neuroticism, this is unlikely. Second, it is possible there is an effect of neuroticism on state self-control, but this study did not accurately identify or assess the mechanisms behind this effect. For example, this relationship could be explained in terms of goal pursuit or the "giving in to feeling good" hypothesis, neither of which the present study accurately manipulated or assessed. Future research should test these models more thoroughly and use measures that are sensitive to the theorized changes in self-control.

Consequences of Low Self-Control

The third and final hypothesis stated that those with the lowest levels of state self-control would experience the highest levels of rumination and negative affect. Although the originally planned analysis was unable to be carried out, exploratory analyses partially supported this hypothesis. Specifically, there was a significant correlation between Stroop latencies and post event processing (r (82) = .237, p = .030) as well as positive affect (r (82) = -.223). This suggest that those with longer Stroop latencies (indicating less self-control) tended to ruminate about the video more. In contrast, those with shorter Stroop latencies (indicating more self-control) tended to experience more positive affect.

Interpreted one way, these results might suggest that those with higher state self-control tended to ruminate less and experience more positive affect. However, given that the Stroop has been previously called into question as valid measure of state self-control, these results are somewhat puzzling. The question now becomes why those with quicker reaction times tended to ruminate less and feel more positive. One possible explanation is that the scores participants received on the Stroop task either boosted or deflated their mood. Simply put, participants who performed well on the Stroop may have felt better about themselves. However, this is unlikely. While participants were able to view their feedback, they did not have anything to compare their scores to. Without a reference point, it is unlikely that participants knew what a "good" score on the Stroop task was, making it hard for them to assess their performance. Therefore, while it is possible that the feedback they received on the Stroop task influenced their mood, it is unlikely.

A much more likely explanation is that this relationship went the other direction. It could very well be that participants who felt more positive and ruminated less performed better on the Stroop. A substantial body of research suggests that positive affect improves performance across

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a number of behavioral (Lyubomirsky, King, & Diener, 2005) and cognitive (Brose, Lövdén, & Schmiedek, 2014) domains. In addition, it would make sense to assume that those who are less distracted by thoughts about the video will also perform better on the Stroop task. It could very well be that positive affect and rumination were not the result of better Stroop performance, but rather the cause of it. This seems to be a much more probable explanation.

Of course, there is one final possibility for why those with better Stroop performance displayed more positive affect and less rumination. It could simply be that this is a spurious relationship, or a false positive. It may be that there is no relationship between Stroop times and affect, and that this finding is merely a relic of the specific sample used. If only one factor (i.e., just positive affect, or just rumination) had been associated with Stroop times, I might be inclined to say that this relationship was spurious. However, given that both factors were moderately correlated with Stroop times, this proposal that this relationship is spurious seems less likely.

To summarize, the evidence does not definitively show that those with higher self-control experience less negative affect and less post event processing. Due to the fact that the Stroop task has been questioned as a valid measure of self-control, the relationships between Stroop times, positive affect, and post event processing must be explained through other means. A likely explanation is that positive affect and low levels of rumination preceded the Stroop task, thus improving performance. More research will be necessary to determine whether this is indeed a plausible explanation.

Regardless of the results of this study, the fact remains that there is a strong relationship between emotions, emotional regulation, and self-control. This is evidenced by many studies that suggest that negative affect leads to poor self-regulation (Renn et al., 2011; Tibbett & Ferrari,

2015; Tice & Bratslavsky, 2000; Tice et al., 2001; Wallace & Newman, 1997). Moreover, a number of studies suggest that following an act of emotional regulation, self-control is subsequently compromised (Baumeister et al. 1998; Friese et al., 2013; Hofmann et al., 2007; Muraven et al., 1998; Wagstaff, 2014). It is still not fully understood why and how individuals experiencing negative affect tend to fail more frequently at self-control. However, there are several theories as to why this relationship exists.

The present study tested the premise that negative affect leads to poor self-control as a result of emotional self-regulation causing ego depletion. In other words, those who experience high levels of negative affect are frequently engaging in emotional self-regulation, an activity which has been previously demonstrated to deplete self-control resources. While the present study used methods that had been successfully employed in previous studies, prior research was nevertheless unable to be replicated. Future research should carefully examine the mechanisms and assumptions underlying self-control, emotion regulation, and how they interact. For example, the verdict is still out as to whether or not self-control is indeed a limited resource. If the limited resource model is incorrect, then self-control depletion cannot adequately explain why those who experience negative affect tend to fail at self-control more often. In such a case, other mechanisms would need to be examined.

Alternatively, negative affect may lead to poor self-control due to the simple fact that people who feel bad engage in behaviors that they believe will make them feel better. Future research should examine this possibility in greater detail. For example, future research should employ a dependent measure of self-control which is especially sensitive to the "giving in to feeling good" premise. This would include using dependent measures which explicitly confer some benefit to the participant if they fail at self-control. This could include offering participants

tempting food, allowing them to spend a set amount of money, or engage is some form of activity where failure means they are choosing short term benefits over long terms gains. Indeed, such a measure would seem to be more in accordance with the model proposed by Fujita (20ll), where self-control is conceptualized as the dilemma between competing proximal and distal motives.

Future Directions

With respect to the specific relationship between neuroticism and self-control, future research should also examine the relationships noted by Renn et al. (2011). These authors suggest that individuals high in neuroticism display improper goal setting, goal monitoring, and goal operating as a result of emotional self-absorption. In other words, an excessive emotional self-focus distracts individuals from their goals. Interestingly, this model appears to share some similarities with the limited resource model that was tested in the present study. In the present study, it was proposed that individuals high in neuroticism are constantly engaged in emotional regulation, and as a result deplete resources needed for later acts of self-control. This sounds very similar to Renn et al.'s (2011) idea that individuals high in neuroticism are emotionally self-absorbed, and thus lack the ability to effectively pursue goals.

However, the model put forth by Renn et al. (2011) makes no mention of the limited resource model of self-control. While it acknowledges that emotional self-absorption may appropriate cognitive resources and lead to procrastination, it does not propose that this resource is being consumed or depleted. This is an extremely important distinction. In the model put forth by Renn et al. (2011), cognitive resources are being used by one system (emotional regulation) and are thus unavailable for simultaneous use by another system (goal pursuit). In contrast, the

limited resource model of self-control posits that cognitive resources are actually being depleted or consumed by one system (emotional regulation), and are thus not only unavailable for simultaneous use by another system, but are also unavailable for subsequent use by another system. According to the limited resource model, self-control decrements should persist even after the emotional regulation has been resolved or terminated, due to the fact that a resource has been depleted. In contrast, the model proposed by Renn et al. (2011) seems to imply that as soon as the emotional self-absorption ceases or is resolved, resources can be immediately allocated elsewhere. In short, the limited resource model states that these cognitive resources are actually *gone*, while the model put forth by Renn et al. (2011) seems to imply that these resources are merely being appropriated by another system, but are not actually gone. Future research should search for innovative ways to test this important distinction.

Interestingly, the aforementioned distinction could speak to a different conceptualization of self-control. In contrast to the limited resource model, Inzlicht and Schmeichel (2012) have proposed the process model of self-control. According to this model, self-control exertion makes future failures of self-control more likely not because a resource has been depleted, but rather because motivational and attentional resources have been oriented toward short term, immediately rewarding activities. Indeed this conceptualization would fit better with the suggestion of Renn et al., (2011). Stated in terms of the process model, emotional self-absorption might lead to a motivational and attentional shift such that regulating behavior and temptations becomes less important that regulating affect and mood. In other words, the motivational and attentional deployment is such that regulating mood takes precedence over regulating behavior. Therefore, behavioral regulation would fall by the wayside, leading to poorer self-control in behavioral domains.

One final suggestion for future research concerns measurement. Proper measurement of self-control has been a recurring theme in this discussion and it deserves careful consideration. As our understanding of what self-control is and how it operates changes, we may want to reconsider how it is measured as well. To use the example from earlier, if we conceptualize self-control as competing proximal and distal motives (Fujita, 2011), then the Stroop task may not be a useful metric. This is due to the fact that the Stroop task provides no benefit to the individual, and thus lacks the element of choice that is present in "real-world" situations involving self-control. Indeed, if we conceptualize self-control as competing proximal and distal motives, we may come to realize that it is in fact very difficult to distill these vast constellations of motives into neat, laboratory friendly packages.

We all have an extremely rich repertoire things that motivate us (food, health, academics, friends, money, recreation, prestige, drugs, environmentalism, etc.). Some of these motives compete with one another (drugs and health), while others may be synergistic (academics and prestige). For any given person, this list is likely to include many different motivators, ranked in just about any possible order of importance one can imagine. This makes it incredibly difficult to manipulate and study how a given individual navigates their own unique constellation of motives. Even if we use more ecologically valid behavioral measures (such as resisting the urge to drink alcohol) we are still, at best, only tapping one very specific relationship between motives at a time (the motive to drink alcohol vs. the motive to maintain health). At worst, we have no idea what we are tapping due to the fact that we cannot predict how a given motivator interacts with other motivators in a constellation (how does my motivation for alcohol weigh against my motives for health, friends, money, academics, and prestige?). Moreover, individuals vary vastly in the relative strength of these competing motives (some people love alcohol while others are

indifferent; some people value health while others do not), making it very difficult to elucidate why they are engaging in a particular behavior. Complicating things further, some behaviors are automatic for certain individuals while they require painful deliberation for others to perform. What constitutes self-control for one individual may be business as usual for another. While it is a daunting task, future research needs to consider innovative ways to study how people's different motivations interact to produce behavior. In order to do this, new ways to accurately measure self-control need to be developed.

In sum, the present study sought to explain the negative relationship between neuroticism and self-control. In doing this it was proposed that the limited resource model, which assumes that emotional regulation depletes limited self-control resources, could explain this relationship. This was not found to be the case. Furthermore, it is unknown whether this was due to faulty assumptions (i.e., limited resource model is incorrect), due to a faulty manipulation of emotion regulation (no group differences on manipulation check), or due to faulty measurement of state self-control (Stroop task). Therefore, future projects should attempt to elucidate the relationship between neuroticism and self-control using different theory (giving in to feeling good or goal pursuit models) as well as different measurement. Understanding how and why neuroticism and negative affect lead to poor self-control is a necessary step in creating the change that will restore a sense of control to the lives of individuals who struggle with emotional regulation.

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APPENDICES

Appendix A: Choice of Video

Which video should be used for the manipulation?

In deciding which video should be used for the manipulation, several factors must be considered. The first decision that must be made is which specific emotion to have participants suppress. Previous studies of emotion regulation have had participants suppress sadness and feelings of empathy by having them view a clip from Mondo Cane (Muraven, Tice, & Baumeister, 1998), which depicts sick and dying animals. Other studies have had participants suppress both positive (happiness) and negative (sadness, anger) emotions by having them view a clip from the film "City of God" which contains scenes involving joy (dancing/love scenes) as well as violence and death (gang fights) (Hofmann, Rauch, & Gawronski, 2007). Studies have also had participants suppress amusement by having them view a humorous clip with Robin Williams (Baumeister, Bratslavsky, Muraven, & Tice, 1998). Another study had participants suppress disgust by making them view a video of a girl who makes herself throw up and then eats her own vomit (Wagstaff, 2014). Conceptually speaking, all acts of emotion regulation are expected to deplete self-control (Tice & Bratslavsky, 2000). Indeed, all of the studies mentioned above found that emotion suppression (whether happiness, sadness, amusement, or disgust) led to depletion effects. However, it should not be overlooked that certain personality characteristics may make the suppression of particular emotions more difficult for certain individuals (Chow, Berenbaum, & Flores, 2013). As previously discussed, neuroticism is characterized by negative thoughts and emotions. It is unlikely that an individual high in this trait will struggle with suppressing feeling of amusement or happiness. Rather, these individuals are more likely to struggle with suppressing negative moods and anxious thoughts. Due to the fact that neuroticism

is a focal variable in this analysis, it seems most appropriate to have participants attempt to suppress a negative emotion rather than a positive one. This will increase ecological validity due to the fact that negative emotions are the ones those higher in neuroticism struggle with most in their everyday environments.

After providing rationale for why the affect regulation task should involve a negative emotion, the next point that must be addressed is how difficult this task should be. This is a very important point. If the video does not elicit strong enough emotions, then suppression will require little effort and an effect is not likely to be found. With this in mind, two pilot studies were conducted.

Pilot Study 1

Procedure

Participants (n = 508) were recruited via Sona from a Southeastern public university. In this online study, participants began by completing the Big 5 Inventory (Donahue & Kentle, 1991), the Brief Self-control Scale (Tangney, Baumeister, & Boone, 2004), and the Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004). Participants were then provided a link to the video (https://vimeo.com/8191217) and told "while watching the video, try to remain as emotionally neutral as possible. This means controlling your subjective feelings as well as controlling your facial expressions. Please try your best to suppress any feelings you may have while viewing this video." The video tells the story of a man and his dog (named Oden). Throughout the video, you learn about this man's connection with Oden, as well as learn that Oden is dying and must be euthanized. The video ends with Oden's death. This video elicits primarily sadness and feelings of empathy. Following the emotion suppression task, participants

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completed four manipulation check items as well as the Post Event Processing Questionnaire
(Rachman, Grüter-Andrew, & Shafran, 2000).

Results

       The primary purpose of this pilot study was to determine how difficult it was for people
to suppress their emotional response to this video. The manipulation check items were therefore
of the greatest interest. Frequencies are displayed in figure 1. As noted previously, it is important
to use a video that is optimally challenging to suppress one's reaction to. Theoretically, the more
difficult it is to suppress one's emotional reaction, the larger the effect will be on self-control
(thus increasing power).

It took a lot of effort to suppress my emotions when watching this video

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	57	11.2	11.2	11.2
	2	31	6.1	6.1	17.3
	3	42	8.3	8.3	25.6
	4	181	35.6	35.6	61.2
	5	51	10.0	10.0	71.3
	6	44	8.7	8.7	79.9
	7	102	20.1	20.1	100.0
	Total	508	100.0	100.0	

It was hard to watch this video

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	54	10.6	10.6	10.6
	2	41	8.1	8.1	18.7
	3	56	11.0	11.0	29.7
	4	129	25.4	25.4	55.1
	5	75	14.8	14.8	69.9
	6	57	11.2	11.2	81.1
	7	96	18.9	18.9	100.0
	Total	508	100.0	100.0	

I felt like crying when I watched this video

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	55	10.8	10.8	10.8
	2	43	8.5	8.5	19.3
	3	48	9.4	9.4	28.7
	4	102	20.1	20.1	48.8
	5	65	12.8	12.8	61.6
	6	60	11.8	11.8	73.4
	7	135	26.6	26.6	100.0
	Total	508	100.0	100.0	

It will be hard for me to stop thinking about this video

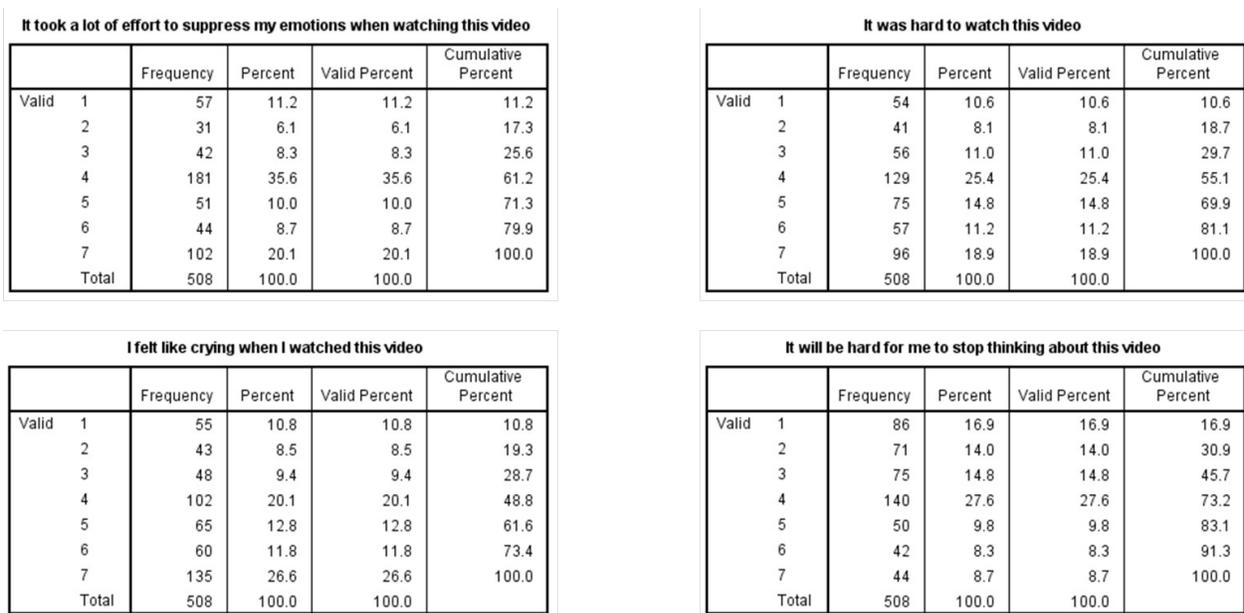|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	86	16.9	16.9	16.9
	2	71	14.0	14.0	30.9
	3	75	14.8	14.8	45.7
	4	140	27.6	27.6	73.2
	5	50	9.8	9.8	83.1
	6	42	8.3	8.3	91.3
	7	44	8.7	8.7	100.0
	Total	508	100.0	100.0	

Figure 1 – Manipulation Check Frequencies for Video 1

       In assessing the difficulty of the emotion regulation task, I examined the percent of
participants who scored above the midpoint (selected 5, 6, or 7) on the manipulation check items.
For the item "It took a lot of effort to suppress my emotions when watching this video", 38.8%

of participants scored above the midpoint. For the item "It was hard to watch this video", 44.9% of participants scored above the midpoint. For the item "I felt like crying when I watched this video", 51.2% of participants scored above the midpoint. Finally, for the item "It will be hard for me to stop thinking about this video", only 26.8% of participants scored above the midpoint.

By and large, participants appeared to find this emotion regulation task only mildly difficult. The only item in which over half of participants scored above the midpoint was "I felt like crying when I watched this video". The fact that the majority participants did not find this emotion regulation task very difficult suggests that it could be too easy. In pilot study 2, a much more aversive video was used.

Pilot Study 2

Procedure

Participants (n = 630) were recruited via Mechanical Turk. Participants began by completing the neuroticism subscale of the Big 5 Inventory (Donahue & Kentle, 1991) and the Brief Self-control Scale (Tangney, Baumeister, & Boone, 2004). Participants were then provided a video link (https://www.youtube.com/watch?v=XPGIMCmpfxU&feature=youtu.be) and told "while watching the video, try to remain as emotionally neutral as possible. This means controlling your subjective feelings as well as controlling your facial expressions. Please try your best to suppress any feelings you may have while viewing this video". This clip depicts the abuse and mistreatment of animals that occurs in Hormel slaughterhouses. This video contains graphic scenes of pigs being mistreated and killed. Whereas the video in pilot study 1 elicits mainly sadness and empathy, this video by contrast elicits feelings of disgust, horror, and possibly guilt.

Following the emotion regulation task, participants completed the four manipulation check items.

Results

The first important finding is that, as compared to video 1, participants had a much more difficult time regulating their emotions to this video. Frequencies are displayed in figure 2. Similar to video 1, I examined the percent of participants who scored above the midpoint (selected 5, 6, or 7) on the manipulation check items. For the item "It took a lot of effort to suppress my emotions when watching this video", 70.3% of participants scored above the midpoint. For the item "It was hard to watch this video", 77.6% of participants scored above the midpoint. For the item "I felt like crying when I watched this video", 46.3% of participants scored above the midpoint. Finally, for the item "It will be hard for me to stop thinking about this video", 57.1% of participants scored above the midpoint.

It took a lot of effort to suppress my emotions when watching this video

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	35	5.6	5.6	5.6
	2	33	5.2	5.2	10.8
	3	36	5.7	5.7	16.5
	4	83	13.2	13.2	29.7
	5	75	11.9	11.9	41.6
	6	85	13.5	13.5	55.1
	7	283	44.9	44.9	100.0
	Total	630	100.0	100.0	

It was hard to watch this video

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	31	4.9	4.9	4.9
	2	16	2.5	2.5	7.5
	3	27	4.3	4.3	11.7
	4	67	10.6	10.6	22.4
	5	50	7.9	7.9	30.3
	6	95	15.1	15.1	45.4
	7	344	54.6	54.6	100.0
	Total	630	100.0	100.0	

I felt like crying when I watched this video

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	129	20.5	20.5	20.5
	2	61	9.7	9.7	30.2
	3	56	8.9	8.9	39.0
	4	92	14.6	14.6	53.7
	5	46	7.3	7.3	61.0
	6	58	9.2	9.2	70.2
	7	188	29.8	29.8	100.0
	Total	630	100.0	100.0	

It will be hard for me to stop thinking about this video

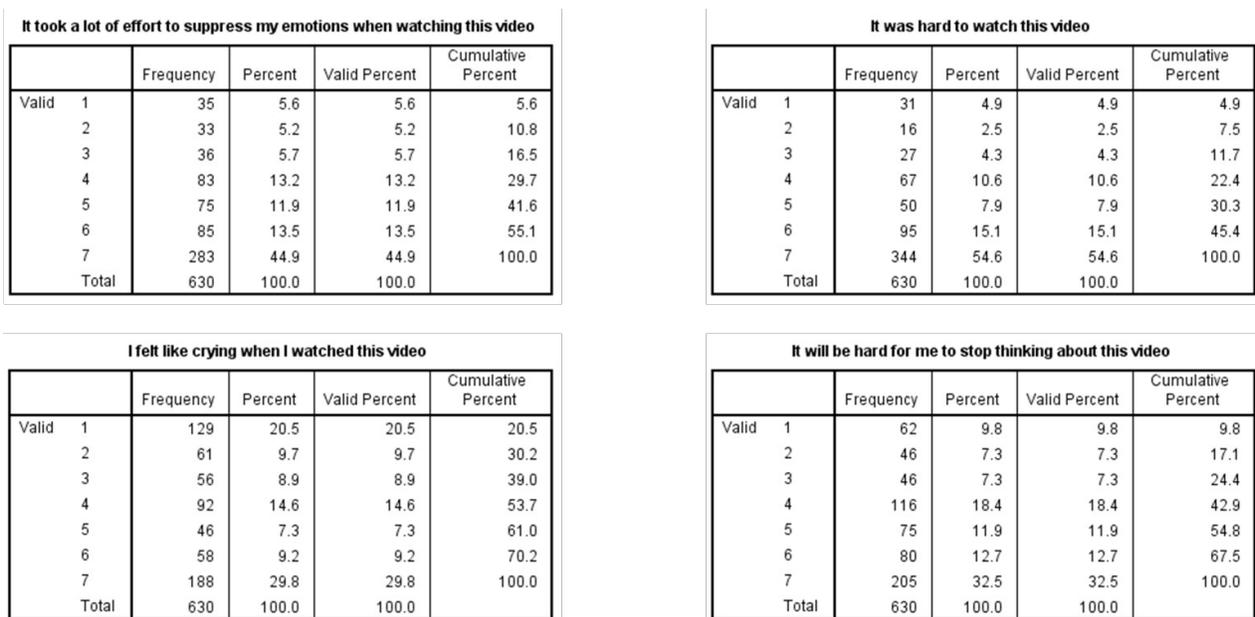|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	62	9.8	9.8	9.8
	2	46	7.3	7.3	17.1
	3	46	7.3	7.3	24.4
	4	116	18.4	18.4	42.9
	5	75	11.9	11.9	54.8
	6	80	12.7	12.7	67.5
	7	205	32.5	32.5	100.0
	Total	630	100.0	100.0	

Figure 2 – Manipulation Check Frequencies for Video 2

Discussion

Overall, participants struggled with regulating their emotional response much more for video 2. As noted earlier, the goal of these pilot studies was to find a video that was optimally challenging in terms of emotion regulation. Although video 1 appeared to be on the easier side in terms of emotion regulation, it did not appear to have a strong floor effect. Responses across all manipulation check items appear to be normally distributed for video 1 (figure 3). However, this is troubling considering that the midpoint of the scale is "neither agree nor disagree". The fact that responses to video 1 are normally distributed means that participants did not experience much difficulty in regulating their emotions. In contrast, responses across all manipulation check items for video 2 display a ceiling effect (figure 4). Undoubtedly, video 2 is more difficult in terms of emotion regulation. The more difficult the emotion regulation task is, the greater the depletion effects will be. This will create a larger effect size in terms of self-control depletion, increasing the power of the study. Additionally, video 2 is expected to have a larger effect in terms of rumination and negative affect (which hypotheses 3 addresses). Clearly, the manipulation check items used in pilot study 2 did not have enough resolution at the high end of the scale to detect differences in task difficulty. A revised manipulation check measure would be able to address this issue. In an attempt to minimize the possibility of a ceiling effect on the manipulation check items, two changes will be made to the manipulation check items. First, the items will be changed from statements (i.e. "It was difficult to suppress my emotion to this video") to direct questions (i.e. "How difficult was it to regulate your emotions to this video?"). Second, the possible responses will be changed from an agree/disagree scale to a scale reflecting greater degrees of difficulty (i.e. 1 = not challenging, 2 = mildly challenging, 3 = somewhat challenging, 4 = quite challenging, 5 = very/highly challenging, 6 = intensely/overwhelmingly

challenging, 7 = impossibly challenging/could not do). The reasoning behind these changes is

that the revised scale should provide a greater range of responses at the higher end of the scale.

In sum, combining the large effect size of video 2 with a revised manipulation check is expected

to yield the greatest statistical power. Therefore, this is the suggested route.
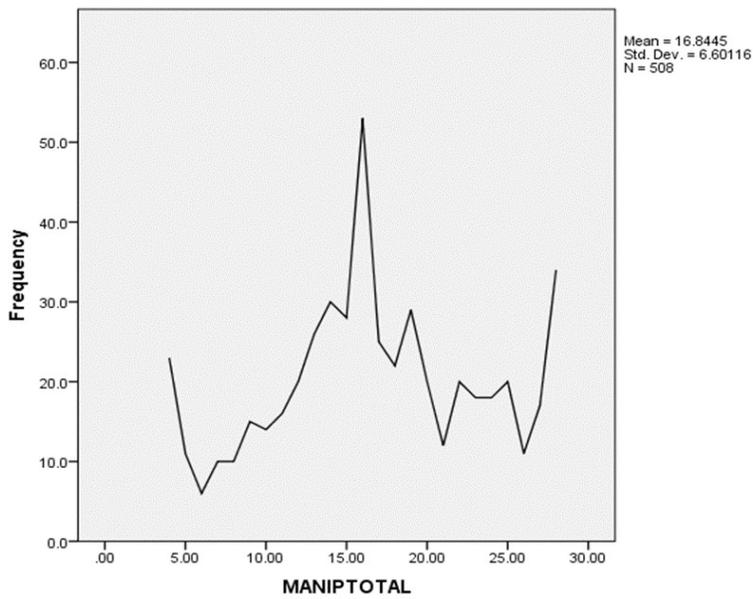
Figure 3 – Graphed Frequencies for Video 1
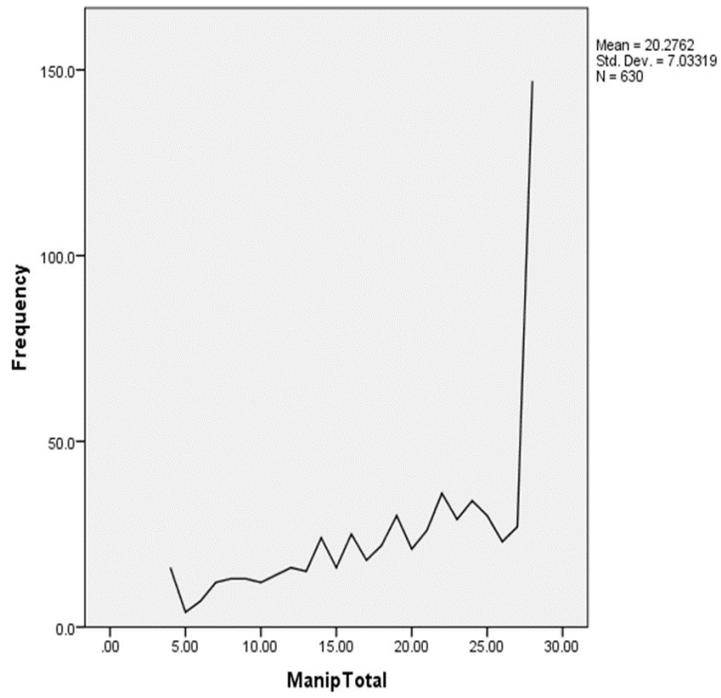
Figure 4 – Graphed Frequencies for Video 2

Demographics Questionnaire

Age: ____

Gender:
__Female
__Male
__Transgender
__Other

Sexual Orientation:
__Bisexual
__Gay
__Lesbian
__Other

Ethnicity:
__Asian / Pacific Islander
__Black or African American
__Hispanic or Latino
__Native American
__Other
__White

Employment Status:
__Employed for wages
__Military
__Out of work and looking for work
__Out of work but not currently looking for work
__Self-employed
__Student
__Retired
__Unable to work

Big 5 Inventory

Instructions: Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly
1	2	3	4	5

I see Myself as Someone Who...

___1. Is talkative
___2. Tends to find fault with others
___3. Does a thorough job
___4. Is depressed, blue
___5. Is original, comes up with new ideas
___6. Is reserved
___7. Is helpful and unselfish with others
___8. Can be somewhat careless
___9. Is relaxed, handles stress well
___10. Is curious about many different things
___11. Is full of energy
___12. Starts quarrels with others
___13. Is a reliable worker
___14. Can be tense
___15. Is ingenious, a deep thinker
___16. Generates a lot of enthusiasm
___17. Has a forgiving nature
___18. Tends to be disorganized
___19. Worries a lot
___20. Has an active imagination
___21. Tends to be quiet
___22. Is generally trusting
___23. Tends to be lazy
___24. Is emotionally stable, not easily upset
___25. Is inventive
___26. Has an assertive personality
___27. Can be cold and aloof
___28. Perseveres until the task is finished
___29. Can be moody
___30. Values artistic, aesthetic experiences
___31. Is sometimes shy, inhibited
___32. Is considerate and kind to almost everyone
___33. Does things efficiently

___34. Remains calm in tense situations
___35. Prefers work that is routine
___36. Is outgoing, sociable
___37. Is sometimes rude to others
___38. Makes plans and follows through with them
___39. Gets nervous easily
___40. Likes to reflect, play with ideas
___41. Has few artistic interests
___42. Likes to cooperate with others
___43. Is easily distracted
___44. Is sophisticated in art, music, or literature

John, O. P., Donahue, E. M., & Kentle, R. L. (1991). The Big Five Inventory--Versions 4a and 54. Berkeley, CA: University of California, Berkeley, Institute of Personality and Social Research.

Self-Control Scale – Brief Version

Instructions: Please indicate how much each of the following statements reflects how you typically are.

1	2	3	4	5
Not at all				Very much

____ 1. I am good at resisting temptation.
____ 2. I have a hard time breaking bad habits.
____ 3. I am lazy.
____ 4. I say inappropriate things.
____ 5. I do certain things that are bad for me, if they are fun.
____ 6. I refuse things that are bad for me.
____ 7. I wish I had more self-discipline.
____ 8. People would say that I have iron self-discipline.
____ 9. Pleasure and fun sometimes keep me from getting work done.
____ 10. I have trouble concentrating.
____ 11. I am able to work effectively toward long-term goals.
____ 12. Sometimes I can't stop myself from doing something, even if I know it is wrong.
____ 13. I often act without thinking through all the alternatives.

Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. Journal of Personality, 72, 271-324.

Manipulation Check

How difficult was it to regulate your emotions to this video?

(1 = not challenging, 2 = mildly challenging, 3 = somewhat challenging, 4 = quite challenging, 5 = very/highly challenging, 6 = intensely/overwhelmingly challenging, 7 = impossibly challenging/could not do).

Post Event Processing Questionnaire

Post-event processing questions. During the past few months, have you experienced anxiety in a social situation (such as at a party, public speaking, dating, etc.)? If yes, than please answer the questions below. (Respondents answered using a visual analogue scale 0±100)

1. How much anxiety did you experience?
2. After the event was over, did you find yourself thinking about it a lot?
3. Did your memories and thoughts about the event keep coming into your head even when you did not wish to
think about it again?
4. Did the thoughts about the event ever interfere with your concentration?
5. Were the thoughts/memories about the event ever welcome to you?
6. Did you find it difficult to forget about the event?
7. Did you try to resist thinking about the event?
8. If you did think about the event, over and over again, did your feelings about the event get worse and worse?
9. If you did think about the event, over and over again, did your feelings about the event get better and better?
10. If you thought about the event, did you see it from your point of view, or how other people would view it?
11. Did you ever wonder about whether you could have avoided or prevented your behaviour/feelings during the
event?
12. Did you ever wish that you could turn the clock back and re-do it/do it again, but do it better?
13. As a result of the event, do you now avoid similar events; did this event this reinforce a decision to avoid similar
situations?

Rachman, S., Grüter-Andrew, J., & Shafran, R. (2000). Post-event processing in social anxiety. Behaviour Research And Therapy, 38(6), 611-617. doi:10.1016/S0005-7967(99)00089-3

The Positive and Negative Affect Schedule

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 [INSERT APPROPRIATE TIME INSTRUCTIONS HERE]. Use the following scale to record your answers.

1 = very slightly or not at all
2 = a little
3 = moderately
4 = quite a bit
5 = extremely

_interested
_distressed
_excited
_upset
_strong
_guilty
_scared
_hostile
_enthusiastic
_proud
_irritable
_alert
_ashamed
_inspired
_nervous
_determined
_attentive
_jittery
_active
_afraid

Moment (you feel this way right now, that is, at the present moment)
Today (you have felt this way today)
Past few days (you have felt this way during the past few days)
Week (you have felt this way during the past week)
Past few weeks (you have felt this way during the past few weeks)
Year (you have felt this way during the past year)
General (you generally feel this way, that is, how you feel on the average)

Appendix H: Descripive Statistics Split by Condition

Table 4

Descriptive Statistics Split by Condition

Variable	Mean	SD	Min	Max
1. Trait Self-control (control)	43.08	7.61	26.00	62.00
2. Trait Self-control (exp)	40.23	7.90	28.00	57.00
3. State Self-control (control)	200.75	100.64	44.57	445.00
4. State Self-control (exp)	199.51	94.80	-15.04	417.31
5. Neuroticism (control)	25.03	7.05	8.00	37.00
6. Neuroticism (exp)	23.27	6.54	10.00	39.00
7. Post Event processing (control)	17.00	7.48	6.00	37.00
8. Post Event Processing (exp)	16.67	8.48	6.00	35.00
9. Positive Affect (control)	22.56	7.97	13.00	47.00
10. Positive Affect (exp)	23.54	9.38	10.00	45.00
11. Negative Affect (control)	17.06	7.11	10.00	38.00
12. Negative Affect (exp)	18.54	7.50	10.00	39.00

VITA

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