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Life History Strategy And The Role Of Self-Regulation In Cheating Behavior

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LIFE HISTORY STRATEGY AND THE ROLE OF SELF-REGULATION IN CHEATING BEHAVIOR

By

Joshua John Reynolds
Bachelor of Science, Southern Oregon University, 2008

A Thesis

Submitted to the Graduate Faculty

of the

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In partial fulfillment of the requirements

for the degree of

Master of Science

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This thesis, submitted by Joshua Reynolds in partial fulfillment of the requirements for the Degree of Master of Science from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done, and is hereby approved.



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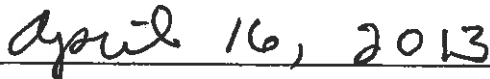
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This thesis is being submitted by the appointed advisory committee as having met all of the requirements of the Graduate School at the University of North Dakota and is hereby approved.



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Joshua Reynolds
4/18/2013

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To Deborah, John, and Jessica

ABSTRACT

The current study examined cheating behavior, the role of self-regulation, and if the distal causal framework of life history theory could illuminate the relationships between self-regulation and cheating behavior. Participants in the experimental condition had their state self-regulation taxed (compared to the control condition); participants had an opportunity to cheat, which was recorded unbeknownst to participants. Additionally, participants completed questionnaires and tasks assessing individuals' life history strategy, trait self-regulation, and mood. It was hypothesized taxed state self-regulation, lower trait self-regulation, and a faster life history strategy would increase cheating behavior and a faster life history strategy would predict lower trait self-regulation. Results illustrate while the taxed self-regulation condition produced no significant change in cheating behavior, a faster life history strategy and the interaction of life history strategy and trait self-regulation were significant predictors of cheating behavior. Implications are discussed.

CHAPTER I

INTRODUCTION

The ability to override responses, inhibit behavior, and control feelings is a complex phenomenon. This ability has been termed self-regulation, self-control, and a feature of executive functioning (Hoyle, 2010). Self-regulation exhibits characteristics of both a trait and a state; whereby stability is characteristic of trait self-regulation and temporal fluctuations are characteristic of state self-regulation (Gailliot, Schmeichel, & Baumeister, 2006). One of the implications of self-regulation concerns cheating behavior (Mead, Baumeister, Gino, Schweitzer, & Ariely, 2009). Ample research exists demonstrating the relationship of both, trait and state self-regulation on cheating behavior. However, there has been considerably less research on distal causal theories that integrate both characteristics of self-regulation as relating to cheating behavior. Life history theory is proposed to aid in understanding both state and trait differences in self-regulation as they apply to cheating behavior.

Cheating Behavior

Cheating behavior can be conceived of in multiple ways depending on the context of the investigation. For example, Mazar, Amir, and Ariely (2008) view cheating behavior synonymous to dishonest behavior. However, evolutionary psychology conceives of cheating behavior as part of an exploitative and deceptive strategy (Walsh & Beaver, 2008). Exploitative and deceptive behavior can be viewed as a means for

acquiring resources by force or fraud. According to Buss and Duntley (2008) an exploitative strategy is one of three strategies for acquiring reproductively relevant resources, the other two being individual strategies (e.g., gather berries and solo hunting) and cooperation based strategies (e.g., social exchange and reciprocal altruism). Two terms related to exploitive and deceptive strategies are socially antagonistic behaviors and criminal behavior. Socially antagonistic behaviors are behaviors the majority of the general population finds disagreeable and possibly believes to require legal action. On the other hand, criminal behavior is in large part exploitative and deceptive behavior but is culturally defined as requiring legal action (Figueredo & Jacobs, 2010). Therefore, while there is considerable overlap in definitions, it is possible for certain behaviors to fit specific definitions but not others; for example, falsely claiming credit on a project for work is exploitative and deceptive but not criminal. The current study focuses on cheating behavior but utilizes the evolutionary theoretical orientation which views cheating as indicative of an exploitative and deceptive strategy. One of the primary vehicles to explain cheating behavior in the current investigation is self-regulation.

Trait Self-Regulation

Williams (2010) characterizes self-regulation, “as the ability to exert control over cognition, emotion, behavior, and physiology” (p. 5). The term self-control has also been used to describe this ability. For example, DeWall, Baumeister, Stillman, and Gailliot (2007) used the term self-control rather than trait self-regulation and referred to the state of self-regulation, as self-regulation. In this work, the trait or dispositional aspect

of self-regulation is called trait self-regulation and the state aspect is referred to as state self-regulation (For a more in depth discussion of the various terms used to describe self-regulation refer to Hoyle, 2010). There are vast implications for trait differences in self-regulation. One implication is that in relationships, self-regulation underlies an individual's ability to accommodate the other person, which in turn leads to more positive relational outcomes (e.g., appropriate empathy display, commitment to the relationship; Finkel & Campbell, 2001). Individuals high in self-regulation are also better able to cope with stress (Mischel, Shoda, & Peake, 1988), avoid addictive behaviors (Tangney, Baumeister, & Boone, 2004), display lower levels of aggression (DeWall et al., 2007), and less likely to break their diets (Vohs & Heatherton, 2000) . Particularly germane to the current investigation, self-regulation has implications for criminal behavior.

Self-regulation has consistently been linked to criminality (Gottfredson & Hirschi, 1990). Self-regulation has been shown to be an important trait underlying antisocial behavior across cultures and nations (Vazsonyi, Pickering, Junger, & Helsing, 2001). Self-regulation has also been shown to predict deviant behavior from teens to adults in their fifties (Burton, Evans, Cullen, Olivares, & Dunaway, 1999). Furthermore, in Pratt and Cullen's (2000) meta-analysis, self-regulation was one of the strongest correlates of criminal activity ($d=.41$). Thus, self-regulation is an established predictor of deviant behavior across the globe and across a wide range of ages. All of these findings however concern the trait of self-regulation. There are also central implications on a wide range of behaviors involving state self-regulation.

State Self-Regulation

According to the strength model of self-regulation there is a limited availability of resources to govern behavior, cognition, and emotion and when self-regulation is depleted, just like a muscle, subsequent tasks that also tap into the same reservoir are affected (Muraven, Tice, & Baumeister, 1998; Vohs & Heatherton, 2000). This effect is termed ego depletion (Muraven et al., 1998). The ego depletion effect has been studied using a variety of experimental tasks and a variety of outcome variables. For instance, in a study by Baumeister, Bratslavsky, Muraven, and Tice (1998) participants (who were instructed to skip a meal before the experiment) who had to eat radishes while inhibiting their inclination to eat cookies, which were near the radishes, gave up sooner on an unsolvable geometry task than participants who were allowed to eat cookies. The results provide evidence for the strength model since inhibiting a self-regulatory response resulted in decreased performance on a subsequent self-regulatory task. Ample research has utilized this two-task methodology in which participants engage in multiple (generally two) self-regulatory tasks and their performance on the second task is used as a measure of self-regulatory performance. Behaviors that have been studied as outcome variables of self-regulation are diverse and include individuals' monetary spending and impression management (Vohs & Faber, 2004; Vohs, Baumeister, & Ciarocco, 2005). In a study on aggressive impulses it was found participants who had a depleted self-regulatory capacity responded more aggressively against a hypothetical character than individuals not depleted of their self-regulatory resources. Importantly, this effect was moderated by individuals' level of trait self-regulation (DeWall et al.,

2007). For example, in one the experiments (Study 4), participants had to imagine a hypothetical scenario, which took place at a bar. In this scenario, participants had the opportunity to aggress against a person of the opposite sex who flirts with their spouse and then violently shoves the participant. Participants rated how likely they would be to smash a bottle on the individual's head. Half of the participants had their self-regulation resources depleted through a prior task that required participants to read a text (taken from an article on neuropsychological assessment) and cross out all the letter "e's" that were followed by a vowel or "e's" that were in a word with a vowel two letters before the "e". In the control condition participants only had to cross out all instances of the letter "e". Prior research has demonstrated the effectiveness of this task for manipulating individuals' self-regulation (Baumeister et al., 1998). The results indicated that self-regulatory resource depleted participants expressed greater intentions of aggressing towards the individual than non-depleted participants. Importantly, among participants who scored relatively low on trait self-regulation (referred to as self-control), depleted self-regulation resources led to an increase in level of intention to aggress. However, among participants who scored relatively high on trait self-regulation, resource depletion did not increase participants' level of intention to aggress. These findings are particularly important for the current investigation because the results established trait self-regulation as a moderator of state self-regulation.

Competing theories exist regarding how the use of self-regulation could affect subsequent tasks including, the idea that self-regulation is a knowledge structure involving schemas, and that self-regulation is a skill or overlearned capacity (For a more

in depth discussion of these competing explanations see Muraven, Tice, & Baumeister, 1998). Some of the evidence that self-regulation may not be a resource that can be depleted comes from Tice, Baumeister, Shmueli, and Muraven (2007) which showed that when participants were shown a funny video or given a surprise gift in-between the self-regulation depletion task and the self-regulation dependent measure, the ego depletion effect was eliminated. This study demonstrated that the ability to inhibit behavior or control responses is effected by more than just the prior use of self-regulation. Meaning, there are variables besides state self-regulation that play a role in behavioral inhibition. Additionally, in an experiment conducted by Muraven and Slessareva (2003), using the standard two-task method, it was found when participants were told the second task would be beneficial to them, the depletion effect of the prior use of self-regulation was eliminated. This study demonstrated increasing individuals' motivation on the subsequent self-regulation task could eradicate the ego depletion effect. Finally, past research has also demonstrated the importance of how participants construe a particular task when assessing state self-regulation (Magen & Gross, 2007). In study 2 of this research, participants used a hand grip as a measure of self-regulation. Some participants were given a neutral framing and other participants were given instructions that the hand grip was a measure of their "willpower". What underscored the idea of "willpower", according to the researchers, was reconstructing temptation as a test of valued internal quality. The results indicated participants who were given the "willpower" framing actually performed better; supporting the authors' argument that cognitive reconstrual can modify reward contingencies. The results of these studies

undermine the strength model of self-regulation as a resource that can be depleted by demonstrating that other tasks unrelated to self-regulation can eliminate the depletion effect and how a task is framed can change self-regulation performance. Meaning, if the state of self-regulation is a resource that can be depleted then a positive change in mood or a reframing of a task should not affect the level of self-regulation resources. In light of these results, it is difficult to reconcile the strength model of self-regulation as a resource or reservoir of willpower. However, these results do not decrease the importance of state self-regulation. On the contrary, these and other findings demonstrate a prior use of self-regulation can have many implications for subsequent behaviors also requiring self-regulation, for example monetary spending (Vohs & Faber, 2004), impression management (Vohs et al., 2005), and aggressive impulses (DeWall et al., 2007). Hence, regardless of which theoretical orientation one adopts, the effects of state self-regulation are evident and it is the effects and fluctuation of state self-regulation and its effect on cheating behavior that are of interest for the current study.

Cheating and Self-Regulation

There are three main studies demonstrating strong evidence for the connection between self-regulation and cheating. In Mead et al. (2009) the experiment involved four groups of participants in a 2 x 2 design. The groups were, depletion, no-depletion, experimenter scored, and self-scored. The experimenter scored condition was included as a comparison to the self-scored condition in which participants were instructed to shred their results, hence creating anonymity and increasing the likelihood of cheating. Participants in the depletion group had their self-regulation resources depleted through

a task requiring them to write an essay without using the letters A or N. The no-depletion group was asked to write an essay without the letters X or Z. Subsequently, participants were given 5 minutes to solve 20 number matrices, each which contained 12 different sets of numbers and 3 digits for each number (e.g., 2.19). Participants had to solve each matrix by finding the 2 sets of numbers that summed to 10. Participants could earn 25 cents for each correct matrix. Participants were then randomly assigned to the experimenter scored condition (the experimenter scored the matrix task) or self-scored condition (the participant scored the matrix task and then shredded the results) before being paid by the experimenter. The results indicated that while actual performance and mood were unaffected by the manipulation; the depletion of self-regulation lead to participants claiming 25% more correct answers. Thus, when participants had their self-regulation resources depleted they were more likely to cheat. In this study actual money was involved which is more indicative of real world cheating behavior. Using similar methodology Gino, Schweitzer, Mead, and Ariely (2011) extended these findings.

In Gino et al. (2011) the authors conducted four experiments to investigate the depletion of self-regulation resources and examine the role of moral awareness and moral identity on cheating behavior. In this study moral awareness was viewed as the process of recognizing a situation as having moral content and implications. Moral identity was viewed as the extent to which an individual defines themselves as a moral person. One of the advantages in this study was the actual number of correct responses for each participant were attained and thus there was no need for a self-scored versus

experimenter scored condition. The first experiment replicated previous work and found participants in the depleted condition cheated more than participants in the no-depletion condition, independent of actual performance on the problem-solving task. In study two, results indicated that depletion of self-regulation resources was related to moral awareness in the cheating task. Study three is of particular interest because it found that people with lower moral identity who underwent self-regulation depletion were more likely to cheat, whereas high moral identity operated as a buffer against cheating behavior for depleted participants. In other words, moral identity moderated the relationship between state self-regulation and cheating behavior. These results suggest moral identity is a possible causal force that drives certain behaviors as they relate to state self-regulation. However, the studies in Gino et al. (2011) as well as in Mead et al. (2009) concerned only state and not trait self-regulation.

Muraven, Pongarsky, and Shmueli (2006) investigated the influence of trait and state self-regulation on cheating behavior. For the cheating task participants were given three logic puzzles on the computer that unbeknownst to the participants were unsolvable. Participants had three minutes to solve the problems after which the computer prompted participants to enter the number of puzzles solved. Cheating behavior was measured in two ways: (1) by how many problems participants reported answering and (2) the time taken to solve the problems because participants could continue to work on the problems even though the computer instructed them to stop. Results indicated participants who had their self-regulation resources depleted and had the opportunity to cheat showed an increase in cheating behavior. Furthermore, lower

levels of trait self-regulation also predicted rule violation. Therefore, this study illustrated trait and state differences in self-regulation are important for the prediction of cheating. The moderating effects of trait self-regulation on state self-regulation were not of prime interest in this research. However, the moderating effects of trait self-regulation on state self-regulation were tested and found to be not significant. The authors concluded it was not an important finding for two reasons. One, the study was not designed to investigate the moderating effects of trait self-regulation. Two, the moderating effects of trait self-regulation on state self-regulation have been found in previous research that was designed to specifically test this hypothesis (DeWall et al., 2007; Muraven, Collins, Shiffman, & Paty, 2005). All the research on cheating behavior and self-regulation does not necessarily support one particular model of self-regulation even though the researchers were adopting the strength model. What these pieces of research evidence indicate is that there are important implications for self-regulation as a trait and state for cheating. The term depletion confers to the strength model however; as it is the effects of self-regulation that are the interest for the current study this effect is referred to as the taxing of self-regulation.

The research presented thus far demonstrates self-regulation helps explain cheating behavior. However, the previous research of state self-regulation and cheating has not offered a distal causal framework that integrates these findings. Gino et al. (2011) proposed moral identity as an important causal force; however while this is an important finding it is not a complete explanation for a number of reasons. One, moral identity only explains the behaviors that relate to moral decisions and as the effects of

self-regulation both as a trait and a state have implications outside of cheating behavior, it is important to adopt a more inclusive theoretical orientation that can explain effects beyond those relating to cheating behavior in order for the findings to generalize to other effects found in the self-regulation literature. For example, the findings that higher self-regulation is associated with enhanced coping mechanisms in stressful situations and being less likely to break one's diet do not necessarily relate to moral identity (Mischel et al., 1988; Vohs & Heatherton, 2000). Second, while there are some important implications for moral identity as a moderator of state self-regulation on cheating behavior, moral identity alone may not offer a functional explanation that integrates and explains complex constructs like self-regulation. Therefore, what is needed is a more functional distal theory that can integrate and explain the effects of self-regulation and has the potential to offer a more inclusive explanation for self-regulatory effects found in the literature. Life history theory may aid our understanding of these complex effects.

Life History Theory

Life history theory has its origins in general evolutionary theory (Figueredo, Vásquez, Brumbach, & Schnieder, 2004). Life history theory proposes that a finite amount of bioenergetic and material resources exist that can be allocated. The two points on this continuum of resource allocation are somatic and reproductive. Somatic effort refers to the energy and resources that are allocated to the continual survival of an individual organism. Reproductive effort refers to the energy and resources for the production of new organisms, which result in the continuation of an individual's genes.

Reproductive effort consists of mating, parental, and nepotistic effort. Mating effort is the bioenergetic and material resources that are allocated to obtain and retain sexual partners. Parental effort is the bioenergetic and material resources that are allocated to enhance offspring survival. Nepotistic effort is the bioenergetic and material resources that are allocated to enhance genetic relative's survival. This continuum between somatic and reproductive effort is described in terms of r-selected versus K-selected species and individuals. Species that are r-selected devote more bioenergetic and material resources towards reproductive effort over somatic effort and mating effort over parental or nepotistic effort. Thus, there is an emphasis on the production of new organisms over the survival of existing organisms which include oneself and/or current offspring; this is referred to as having a fast life history strategy. K-selected species emphasize somatic effort over reproductive effort and parental or nepotistic effort over mating effort; this is referred to as having a slow life history strategy. Depending on where the resources are being allocated has important implications and there are both between and within-species differences.

Rabbits would be an example of an r-selected species or fast life history strategists. Rabbits have very fast sexual development, high fertility, little parental care, high infant mortality, and the adult rabbits do not live very long. Elephants are a K-selected species or slow life history strategists who exhibit very slow sexual development, produce a smaller amount of offspring at any given time, show high parental care per offspring, have low infant mortality, and the adults have a long lifespan (Figueredo et al., 2006). K-selected species are thought to have evolved in

unstable environments where the production of new organisms would be a useful strategy compared to r-selected species who have developed in stable conditions in which a strategy that enhances oneself would be more advantageous. It is important to note that neither strategy is inherently superior; each strategy can be advantageous or disadvantageous depending on specific environmental contingencies.

Humans are an example of a K-selected species. However, there are vast individual differences. Figuerdo, Vásquez, Brumbach, and Schneider (2005) utilizing the National Survey of Midlife Development in the United States (MIDUS) survey data found that 20 scales measuring cognitive and behavioral dimensions theoretically linked to life history strategy could be reduced to a single construct. Examples of these dimensions include sexuality, religiosity, psychological health, socioeconomic status, community participation, social relationships, physical health, parenting and relationship styles, and community participation. This construct called the K-factor accounted for 70% of the reliable variance. Research on the K-factor found that differential levels combined into a meaningful profile of psychosocial traits. This non-random assortment of psychosocial traits is predicted from life history theory because there are certain traits, which facilitate certain reproductive strategies and solve adaptive problems (Figuerdo et al., 2004; Figuerdo et al., 2005a, Figuerdo et al., 2006). For instance, individuals with a slower life history strategy should have greater general health, developmental stability, consistency in their mental and physical functioning, and investment in genetically related individuals (Rushton, 1985). Research indicates that a slower life history strategy is associated with long-term mating, high parental investment, high group altruism, law

abidingness, and low risk taking (Figuerdo et al., 2004; Figuerdo et al., 2005a, Figuerdo et al., 2006). Individuals with a slow life history strategy exhibit these characteristics because that is what is necessary to pursue this reproductive strategy.

While some have viewed general intelligence as the centerpiece of a slow life history strategy the research does not support such a strong link (Gladden, Figueredo, & Jacobs, 2009). On the other hand research has supported a strong link between life history and self-regulation (Wenner, 2011). An alternative view and the one purported here, is that self-regulation or executive functioning may be the centerpiece of a slow life history strategy. The reasoning behind this is because while high intelligence may be a consequence of investing more in somatic effort (indicative of a slow life history strategy) it is not necessary to pursue a slow life history strategy. On the other hand, the focus on more long term mating (indicative of a slow life history strategy) requires the ability to self-regulate. Thus, it is not unreasonable to purport that self-regulation abilities would be preferentially enhanced (or not enhanced) because self-regulation may play a more central role in pursuing a particular reproductive strategy.

In the trait self-regulation section evidence was presented on the connection between self-regulation and cheating behavior (Muraven et al., 2006; Mead et al., 2009; Gino et al., 2011). A link also exists between life history strategy and criminality consistent with predictions of the theory (Ellis, 1998; Rushton, 1985). Rowe, Vazsonyi, and Figueredo (1997) found higher levels of mating effort, which is indicative of a faster life history strategy were associated with criminality. In Charles and Egan (2005), mating effort was associated with higher levels of self-reported delinquency. In Wenner (2011)

life history strategy and self-regulation was positively correlated, life history and antagonistic attitudes was negatively correlated, and self-regulation mediated the relationship between life history strategy and antagonistic attitudes and behaviors. Gladden, Sisco, and Figueredo (2008) found that a slow life history strategy acted as a protective factor and was negatively related to sexual coercion. In other words, life history strategy is a driving force between trait self-regulation and exploitative and deceptive behaviors, and in turn trait and state self-regulation are related to exploitative and deceptive behaviors. The relationship between self-regulation and exploitative and deceptive behavior is predicted from life history theory. Allocating more resources to reproductive effort means favoring current reproduction at the cost of a reduced chance of survival and this trade off implies there are fewer resources available to be devoted to traits like self-regulation which is not as essential to a fast life history strategy. As previously discussed, this lower trait self-regulation leads to more exploitative and deceptive behavior. Therefore, life history theory offers a vehicle to explain these behaviors in a more distal way. While there is past research investigating the relationships between life history strategy, self-regulation, and exploitative and deceptive behavior, there are three unique characteristics of the current study that will add to the existing literature.

Current Study

First, previous research has linked life history strategy to trait self-regulation as well as both trait and state self-regulation to exploitative and deceptive behavior. However, there has been little research utilizing a distal theoretical framework

addressing both trait and state self-regulation and the function these constructs serve, a gap the current study tried to fill. Second, while there is evidence establishing a link between life history strategy and exploitative and deceptive behavior, the research has relied more on self-report measures. The current research utilized an experimental situation allowing for the observation of actual exploitative and deceptive behavior. Third, the current study extended past research on methodological issues concerned with the observation of exploitative and deceptive behavior. Previous research examining cheating behavior (e.g., Mead et al., 2009) utilized experimenter and self-scored conditions to assess cheating behavior because the actual number of correct responses was unattainable. However, in the current study the actual number of correct responses was attained by means of the monitoring software Spector Pro (Version 7.0.0.7027). The Spector Pro software allows an individual surreptitiously to save every keystroke and click of the mouse on the computer unbeknownst to the participants.

The following specific predictions were made based on past findings implicating life history strategy, trait and state self-regulation, and cheating behavior. Two hypotheses are framed as alternative hypotheses. It was hypothesized the experimental condition would have a direct effect on cheating behavior (e.g., Mead et al., 2011). Specifically, participants in the experimental condition who had their state self-regulation taxed would cheat more than participants in the control group who did not have their state self-regulation taxed (Hypothesis 1). As an alternative to the first hypothesis, it was hypothesized state self-regulation would not have variance distinct from trait self-regulation when predicting cheating behavior (Hypothesis 2). It was

hypothesized that life history strategy would positively predict trait self-regulation (Hypothesis 3). It was hypothesized that life history strategy and trait self-regulation would negatively predict cheating behavior (Hypothesis 4). An alternative hypothesis to hypothesis 4 is, the effect of life history and trait self-regulation are in part conditional on each other, meaning the main effects are qualified by a significant interaction between life history strategy and trait self-regulation (Hypothesis 5).

CHAPTER II

METHOD

Participants and Design

Participants consisted of 130 University of North Dakota students who finished both the online and on campus portion of the experiment. There were 390 participants who did not complete both parts of the study and therefore were not included in the analyses. The sample consisted of 80% female, 20% male, and 93% Caucasian, with the majority (74%) being specifically Caucasian female. For further demographic information, refer to Table 1. Participants were recruited from the Department of Psychology participant pool. Participants received extra credit for their participation and had the opportunity to earn money on the cheating/matrix task in the amount of \$0 to \$5. The current study was a mixed design with one between-participants factor (State Self-Regulation: taxation versus no taxation) and 3 within-participants variables (life history strategy, trait self-regulation, and cheating behavior)

Table 1.
Summary of Demographic Information Presented as Frequencies

Variable	Female	Male
Sex	104	26
Mean age (<i>SD</i>)	19.85 (2.32)	20.31 (2.47)
Race/Ethnicity		
Caucasian	97	24
African-American	3	0
Asian-American	2	1
	18	

Table 1. Cont.

Variable	Female	Male
Hispanic-American	1	1
Native American	5	0
Other	1	0
Political Orientation		
1-Liberal	2	3
2	9	0
3	6	2
4	5	0
5-Moderate	48	15
6	5	2
7	9	1
8	9	3
9	5	1
10-Conservative	6	1
Highest Level of Education		
Less than high school	0	0
High school/GED	12	2
Some college	84	21
College degree	7	3
Master's degree	1	0
Doctoral/Professional degree	0	0
Marital Status		
Single, never married	97	24
Divorced	1	0
Cohabiting	1	1
Married	4	1
Widowed	1	0
Family Income		
Less than \$25,000	23	7
\$25,000 to \$49,999	23	2
\$50,000 to \$99,999	28	10
\$100,000 or more	30	7
Children		
Yes	2	1
No	102	25

Measures

Participants were asked to fill out four questionnaires: a basic demographic questionnaire, the Arizona Life History Battery, the Behavioral Rating Inventory of Executive Function-Adult Version, and the Positive and Negative Affect Schedule-Expanded Form.

Life history strategy was measured with the Arizona Life History Battery (ALHB), (Figueredo, 2007; Figueredo et al., 2006). This is a 199-item questionnaire assessing behavioral and attitudinal manifestations of a slow life history strategy. This questionnaire consists of eight different inventories which are: *Mini-K short form measure of life history strategy* (20-items), *Insight, Planning and Control* (20-items), *Mother/Father relationship quality* (26-items), *Family Social Contact and Support* (15-items), *Friends Social Contact and Support* (15-items), *Experiences in Close Relationships* (36-items), *General Altruism* (50-items), and *Religiosity* (17-items).

Trait self-regulation was measured with a shortened version of the Behavioral Rating Inventory of Executive Function-Adult Version (BRIEF-A; Gioia & Isquith, 2002). This is a 30-item measure with items pertaining to behaviors such as emotional outbursts and organizational abilities and their frequency over the past month with a higher score indicative of lower trait self-regulation. For ease of interpretation, in the data analytic stage, items were reverse coded so that a high score indicated higher trait self-regulation and a lower score indicate lower trait self-regulation.

Mood as a state was measured with the Positive and Negative Affect Schedule-Expanded Form (PANAS-X; Watson & Clark, 1994). This 60-item measure was used to

measure possible emotional differences that may result from the self-regulation taxation task.

Procedure

Participants first provided informed consent through the SONA online system. Participants then completed the demographic questionnaire, ALHB, and the BRIEF-A using SONA, and then signed-up to come into the lab. Participants completed the in lab portion during individual sessions. Upon arrival at the lab, participants were randomly assigned to either the experimental or control condition. Participants in the experimental condition were asked to write an essay without using words containing the letters A or N (adapted from Schmeichel, 2007). The control group was given an essay to write in which they could not use the letters X or Z (Schmeichel, 2007). Both groups did this for 5 minutes as indicated to the participant by a timer. Then, participants were given the PANAS-X in order to test for differences in mood.

Next, participants completed the cheating task. The current study employed a modified version of the procedure used by Gino et al. (2011) and Mead et al. (2010). Gino et al. (2011) and Mead et al (2010) used the matrices originally developed by Mazar et al. (2008) and in accordance with past research these matrices were utilized in the current study. In detail, participants were presented with 20 matrices on a word document (12 point century gothic font) presented on a 17-inch computer screen. Each matrix contained three rows and four columns resulting in a total of 12 number boxes. Each box contained a three-digit number (e.g., 5.66). Participants were instructed to find the two boxes that sum to the value of 10, (e.g., 3.81 and 6.19). The participants were

instructed to highlight these numbers and a box corresponding to each matrix labeled “Found it”. Participants would receive 25 cents for each correct answer and were given a total of 5 minutes to solve as many matrices as possible. Before beginning the task, participants were told that the researchers were not interested in what specific matrixes they solved correctly, only the total number the participant could correctly solve within the allotted time. The participants were further told that for this reason the participant did not need to save the results but rather count the number of matrices correctly solved after 5 minutes, record that number on a separate piece of paper, and close the word document without saving the changes. Therefore, participants were led to believe their answers could not be checked, thus encouraging cheating behavior. However, as mentioned above, the current experiment employed the monitoring software Spector Pro (Version 7.0.0.7027) unbeknownst to participants; thus recording participants every keystroke and allowing for an accurate record of the actual number of matrices solved by each participant. This difference in reported versus actual number of solved matrices constituted the dependent variable *cheating*. Lastly, participants answered two manipulation check questions and exited the room where they were met by the experimenter and paid. Manipulation check question 1 asked participants to rate the difficulty of the writing task. Manipulation check question 2 asked participants to rate how much mental effort was required to not write the requested letters. These manipulation checks were used to evaluate if the state self-regulation manipulation had the intended effect and have been used in past research (e.g., Gino et al., 2011).

CHAPTER III

RESULTS

Of the 130 participants who completed both parts of the study there were 64 participants in the control condition (X or Z) and 66 participants in the experimental condition (A or N). Cheating behavior was present in the sample, and due to the methodology of the study, two cheating strategies were possible. One strategy was to mark an answer and claim it was correct even though it was not. The matrix task is viewed as a search task and as long as participants can reliably count to 10, they have the ability to confirm an answer was correct or incorrect. This cheating strategy may be akin to *plausible deniability*. In comparison, the second cheating strategy was to claim a matrix was solved and not mark anything. This second cheating strategy could be considered a more overt form of cheating. This was measured by opening Spector Pro software and locating each participant's matrix task that was saved unbeknownst to the participants. Next, the correct number of matrices solved was recorded and cheating was identified. There were two ways to identify cheating corresponding to the two different cheating possible strategies. The first cheating strategy could be evidenced by selecting a specific matrix as correct when it was not correct. For example, choosing the numbers 7.13 and 5.49 instead of 4.18 and 5.82 and claiming it was correct. This would indicate cheating on this specific matrix. The second cheating strategy could be

evidenced by claiming a correct answer when nothing was selected. For example, if a participant claimed 4 correct answers but did not highlight a single number, this would indicate cheating strategy 2 with a frequency of 4. There were sixty-nine participants who employed cheating strategy 1 at least once, seven participants who employed cheating strategy 2 at least once, four participants who employed both cheating strategies, and seventy-two participants who employed at least one of the cheating strategies. Although there were two cheating strategies possible this was not of central interest in the current study. The main dependent variable was the total number of matrixes cheated on. The possible range was 0-20, because there were 20 matrixes in total, while the observed range was 0-9 ($M = 1.16$, $SD = 1.6$).

Hypothesis 1

To test hypothesis 1 that postulated an increase in cheating behavior in the experimental condition, an independent samples t-test was conducted, with condition as the independent variable and total number of matrices cheated on as the dependent variable. Results indicated, the control condition ($M = 1.14$, $SD = 1.42$) and experimental condition ($M = 1.19$, $SD = 1.77$) were not significantly different, $t(128) = -0.19$, $p = .842$. According to Levene's test, the assumption of homogeneity of variance was met $p = .255$. However, an examination of the Q-Q plot as well as the Shapiro Wilks test, $p < .05$, revealed the dependent variable (cheating) was not normally distributed. Therefore, a Mann-Whitney U test was conducted to further test the first hypothesis. The Mann-Whitney U test is a nonparametric alternative to the independent samples t-test, which allows for non-normal distributions (Myers, Well, & Lorch, 2010). Consistent with the

results using the independent samples t-test, the groups were not statistically different. ($U = 2,035.50, p = .71$). This indicates the state self-regulation manipulation made no difference in the amount of cheating. The significance of this will be addressed in more detail in the discussion section.

Hypothesis 2

Hypothesis 2 proposed as an alternative hypothesis required that condition (state self-regulation manipulation) be statistically significant, as it was not, no further analyses were required.

Hypothesis 3

Pearson's r was used to test hypothesis 3 that a slower life history strategy positively predicts trait self-regulation, with results showing a significant correlation between life history strategy and trait self-regulation, $r(130) = .25, p = .003$. This means consistent with hypothesis 3, slower life history strategy was positively related to trait self-regulation.

Hypotheses 4 and 5

To test hypotheses 4 and 5, life history strategy, trait self-regulation, and cheating behavior were modeled using generalized linear modeling (McCullagh & Nelder, 1989). The distribution which best represented the data was a variation of a binomial probability distribution where the distribution was fixed at 20 trials (corresponding to 20 matrices) and a Bernoulli trial "success" actually represented cheating, with a logit link function. According to the Pearson chi square goodness of fit statistic ($\chi^2 = 2.02$), there was adequate model fit. As evidenced by the fit statistic there

is some overdispersion. Overdispersion can lead to several consequences including an increase in Type I errors and is common to generalized linear modeling (McCullagh & Nelder, 1989). The issue of overdispersion in the current study will be discussed. The variables included in the model were life history, trait self-regulation, and the interaction between life history strategy and trait self-regulation. The omnibus test for Likelihood Ratio Chi Square with 3 degrees of freedom was significant, $p < .001$. There was a significant main effect for life history strategy $\chi^2 = 25.79$, $p < .001$. Examination of parameter estimate (-2.98 for life history strategy) indicated that individuals with a slower life history strategy had a lower probability of cheating or alternatively, individuals with a faster life history strategy had a higher probability of cheating. There was no significant main effect for trait self-regulation $\chi^2 = 0.02$, $p = .887$. Finally, there was a significant interaction between trait self-regulation and life history strategy, $\chi^2 = 27.69$, $p < .001$. The parameter estimate for the interaction was 0.66. Specifically, for fast life history strategists, those individuals with high trait self-regulation (75th percentile) had a lower probability of cheating compared to fast life history strategists with low trait self-regulation (25th percentile). However, for slow life history strategists this was reversed and high trait self-regulation was associated with a higher probability of cheating (see Figure 1).

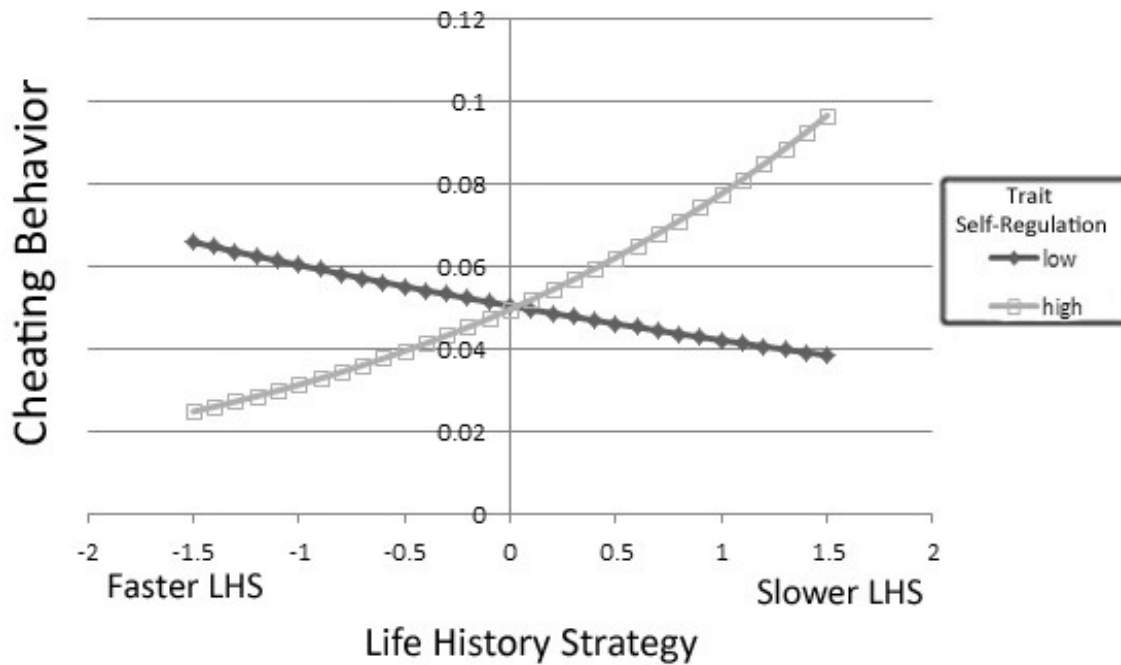


Figure 1. Trait Self-Regulation x Life History Strategy interaction where the effect of life history strategy on cheating is shown separately for high (75th percentile) and low (25th percentile) trait self-regulation individuals.

In summary, only life history strategy had a significant effect by itself, not trait self-regulation. However, trait self-regulation did interact with life history strategy, with trait self-regulation modifying the probability of cheating dependent upon individuals being fast or slow life history strategists.

Exploratory Analyses

To assess the state self-regulation and cheating relationship exploratory analyses were conducted. Following the generalized linear modeling procedures used in hypotheses 4 and 5, a State Self-Regulation x Trait Self-Regulation interaction, as well as a State Self-Regulation x Life History Strategy interaction was tested. The omnibus test

for Likelihood Ratio Chi Square with 5 degrees of freedom was not significant, $p < .089$. There was a no significant State Self-Regulation x Trait Self-Regulation interaction, $\chi^2 = 3.57, p = .059$. Neither was there a significant State Self-Regulation x Life History Strategy interaction, $\chi^2 = 0.16, p = .687$. Therefore, state self-regulation did not relate to cheating behavior through interacting with either trait self-regulation or life history strategy.

Manipulation Checks

Two manipulation checks were evaluated to determine if the state self-regulation manipulation had an effect. Manipulation check 1 pertained to the difficulty of the writing task while manipulation check 2 pertained to how much mental effort was required to not write the requested letters. Two independent samples t-test were conducted. Writing task difficulty (MC1) results indicated a significant difference between the control condition ($M = 2.59, SD = 1.88$) and experimental condition ($M = 5.57, SD = 1.34$), $t(128) = 10.40, p < .001$. This indicates the experimental condition (A or N task) was rated as more difficult compared to the control condition (X or Z). Amount of mental effort (MC2) results indicated a significant difference between the control condition ($M = 3.07, SD = 2.81$) and experimental condition ($M = 6.13, SD = .83$), $t(128) = 8.43, p < .001$. This indicates the experimental condition (A or N task) required more mental effort than the control condition (X or Z). Results from the manipulation checks are evidence the state self-regulation manipulation did have the intended effect. There is also evidence from the amount of errors on the writing task that demonstrates the experimental manipulation did have the intended effect. An error on the writing task

was defined as writing a letter that had been requested to not be written either by itself or in a word. For example, writing the word “apple” when the participant was in the experimental condition (A or N). The majority of participants ($n = 104$) made 0 errors when completing the writing task ($M = 0.52, SD = 1.53$). However, t-test results indicated the number of errors on the writing task did differ as a function of condition, $t(128) = -3.38, p < .001$. Specifically, participants in the experimental condition ($M = 0.95, SD = 2.05$) made more errors than participants in the control condition ($M=0.07, SD = 0.27$). However, these results do not show that the manipulation did not have an effect. The experimental condition is purposely more difficult than the control condition, thus an increase in errors in the experimental condition is not evidence of a manipulation failure. However, to further demonstrate this point an additional t-test was conducted on condition and total number of matrices cheated on, this time excluding those participants who made more than 1 error on the writing task. These results still demonstrate that experimental condition ($M = 1.32, SD = 1.91$) and control condition ($M = 1.14, SD = 1.42$) did not significantly differ, $t(115) = -0.58, p = .562$. It should be noted that neither Mead et al. (2009) nor Gino et al. (2011) made mention of frequency of errors on the writing task.

In addition to the two manipulation check questions and the error checking on the writing task, the PANAS-X was used to test for possible differences in mood. The results of the t-test for positive mood indicate the experimental condition ($M = 2.69, SD = 0.70$) and control condition ($M = 2.72, SD = 0.72$) did not significantly differ, $t(128) = 0.19, p = .843$. Similarly, for negative mood, the experimental condition ($M = 1.36, SD =$

0.47) and the control condition ($M = 1.34$, $SD = 0.37$) did not significantly differ, $t(128) = -0.36$, $p = .715$. This indicates the experimental manipulation did not change participant's mood compared to the control condition. Results from two manipulation check questions and the PANAS-X are consistent with findings from Gino et al. (2011) and indicate the experimental manipulation did have the intended effect.

CHAPTER IV

DISCUSSION

State Self-Regulation

The current data offer new insights into the role of self-regulation on cheating behavior and provide evidence of life history theory. The prediction that the self-regulation taxed group would cheat more was not supported by the data (Hypothesis 1). The data indicate that participants in the taxed group cheated no more than participants in the not taxed group. This was inconsistent with previous findings on cheating and state self-regulation. Gino et al. (2011) and Mead et al. (2009) found evidence that participants who were in the self-regulation depletion group cheated more than participants in the control condition. The current findings did not replicate past results and several possible explanations exist. The first explanation concerns the strength and ecological validity of the self-regulation taxation task. The type of task used in the current study can be considered a minimal manipulation and therefore it may not have been strong enough to affect cheating. However, this task from Schmeichel (2007) was the same task used in Mead et al. (2009), which would argue against that explanation. In addition to the minimal manipulation nature of the Schmeichel (2007) state self-regulation task, this task may be lower in ecological validity. The Schmeichel (2007) task which requires participants to not write particular letters in an essay is not indicative of the type of self-regulation taxing situations that occurs in most people's lives. In

comparison, the self-regulation manipulation in Baumeister et al. (1998) in which participants had to eat radishes while inhibiting their inclination to eat cookies appears to be a more ecologically valid task. This type of task is similar to the dietary decisions that many people face daily and thus may generalize better. If the Schmeichel (2007) task is low in ecological validity, replicating the findings from the task in a different population or in a non-diverse sample of participants may be problematic (Brunswick, 1956). Therefore, the current non-significant findings of state self-regulation may in part be due to the state self-regulation task.

A second explanation is that the experimental manipulation did not tax self-regulation in the intended manner. However, results from the manipulation check show consistent with previous findings (e.g., Gino et al., 2011) that participants in the taxation group expended more mental effort, rated it as more difficult, but did not differ from the control group on mood which is evidence against this explanation. Further research will be required to understand the nature of the state self-regulation and cheating relationship and future research may benefit from considering the ecological validity of state self-regulation manipulations.

State Self-Regulation Interactions

The exploratory analyses of possible effects of a State Self-Regulation x Trait Self-Regulation and State Self-Regulation x Life History Strategy interaction were tested but neither was significant. These results should be interpreted with caution due to the non-replicated findings of the state self-regulation condition. Muraven et al. (2006) also showed a non-significant trait self-regulation and state self-regulation interaction,

however in that study both trait and state self-regulation were significant effects. Research has shown that there are moderating effects of trait self-regulation for state self-regulation on aggressive impulses (DeWall et al., 2007). However, rather than moderation, state self-regulation may play a mediating role in the trait self-regulation and cheating relationship. Part of the reason the mediating role of state self-regulation has been less explored is due to the typical design of state self-regulation studies (e.g., DeWall et al., 2007; Mead et al., 2009; Gino et al., 2011), that is to treat state self-regulation as a between subject variable. Future research may benefit from incorporating a repeated measures design where there are multiple state self-regulation tasks as well as measuring trait self-regulation through a questionnaire. Meaning, participants would complete a trait self-regulation questionnaire then engage in a sequence of tasks designed to tax state self-regulation. This design may be better suited to understanding the trait and state self-regulation relationship because it could test the possible mediating role of state self-regulation as well as the nature (i.e., linear, logarithmic, cubic etc.) of the fluctuations in state self-regulation. Further research will be required to illuminate the role of state self-regulation on cheating.

State and Trait Self-Regulation

Hypothesis 2, proposed as an alternative hypothesis did not require testing. This alternative hypothesis if found to be supported, would have indicated that state self-regulation in regards to cheating, does not yield predictive power distinct from trait self-regulation. This evidence would therefore have suggested that the focus of the relationship between self-regulation and cheating should be concentrated on trait self-

regulation rather than state self-regulation. However, as the experimental manipulation produced no reliable change in cheating, the planned hierarchical generalized linear modeling was unnecessary.

Life History Strategy and Trait Self-Regulation

The direct test of life history theory predicting slower life history strategy to be associated with higher trait self-regulation was supported (Hypothesis 3). The results show consistent with life history theory individuals with a slower life history strategy tend to have higher trait self-regulation. This result is consistent with previous findings (e.g., Wenner, 2011) and supports the theory of life history. Some past research concerning trait self-regulation, for example Muraven et al. (2006), did not integrate a theory to explain why individuals have different degrees of self-regulation. The current findings demonstrate the utility of a distal framework. Meaning, in addition to predicting a relationship between life history strategy and trait self-regulation, life history theory explains the distal causes of trait self-regulation and the function of trait self-regulation, which according to life history theory and the current findings are survival and mating oriented.

The prediction that life history strategy and trait self-regulation would predict cheating was partially supported with life history strategy but not trait self-regulation being significant in the model (Hypothesis 4). Based on life history theory it was predicted a faster life history strategy would indicate a higher probability of cheating, which was confirmed. Although lower trait self-regulation was not directly associated with an increased probability of cheating, the Trait Self-Regulation x Life History Strategy

interaction was significant (Hypothesis 5). The evidence indicates, individuals with a faster life history strategy are more likely to cheat and a faster life history strategy is associated with lower trait self-regulation. Lower trait self-regulation by itself was not associated with a higher probability of cheating or alternatively, higher trait self-regulation was not associated with a lower probability of cheating. However, for individuals with a faster life history strategy but who also had higher trait self-regulation, self-regulation acted as a protective factor in decreasing the probability of cheating. This finding indicates that even though individuals with a faster life history strategy are more likely to have lower trait self-regulation, a portion of fast life history strategists have relatively high trait self-regulation which may decrease the probability they engage in exploitative and deceptive strategies. Surprisingly, slow life history strategists in combination with high trait self-regulation increased the probability of cheating. Further research will be required to understand why trait self-regulation increased the probability of cheating for some slow life history strategists; however, the perception of risk may have played a role.

Perception of risk has been shown to play a role in criminal behavior. For example, in a sample of high-risk juvenile offenders Loughran et al. (2011) found the greater the perceived risk of arrest the less self-reported crime. In the current study, from the perspective of the participants, there were no apparent means to be caught and punished for cheating. However, in the real world risk of engaging in exploitative and deceptive behavior and the probability of being caught are more salient. Therefore, trait self-regulation having opposite effects for fast and slow life history strategists may

specifically be predictive of those situations that are characterized as being low risk. There is evidence in the current findings based on the proportion of cheating compared to other studies, indicating that participants may have perceived the risk of cheating to be particularly low. For example, Gino et al. (2011) reported percentages of total cheating in the four studies of 23%, 30%, 43%, and 34% respectively; whereas total cheating was observed at 55% in the current study. This suggests the methodology in the current study resulted in a larger percentage of total cheating behavior compared to past findings. This could be attributable to participants' lower perceived risk of being caught. Future studies should evaluate perceived risk with regards to the current findings as well as a function of methodology in order to untangle this difference in observed cheating behavior.

To understand the nature of the Trait Self-Regulation x Life History Strategy interaction incorporating a risk dimension may be beneficial; for example, participants are able to cheat but a research assistant occasionally monitors the participant's progress on the cheating task, thus increasing the risk of being caught. Although the current findings suggest a moderating role for trait self-regulation, the mediating role of trait self-regulation has also been explored.

Wenner (2011) found trait self-regulation mediated the relationship between life history strategy and self-reported antagonistic attitudes and behaviors. However, this research was not focused on behavioral observations. Therefore, it is possible for actual acts of what this research calls exploitative and deceptive behavior (e.g., cheating), the relationship of self-regulation is different (i.e., involving moderation), or

at least there may be important differences due to the type of methodology used (i.e., self-report vs. behavioral observation). These findings contribute to previous work on self-regulation and cheating behavior.

Limitations

Possible limitations of the current study include sample characteristics and model overdispersion. In this study the majority of the participants were female. However, the majority of criminal acts are committed by males (Rowe, Vazsonyi, & Flannery, 1995). According to a statistical compilation of self-reported delinquent behavior Gottfredson and Hirschi (1990) found a ratio of 1.28:1 males to females who steal \$2.00 to \$50.00 and 2.7:1 males to females who steal more than \$50.00. For more serious acts especially violent ones, the ratio increases dramatically. Therefore, in a study with a 4:1 ratio of females to males the results may not necessarily generalize to the majority of individuals engaging in a variety of exploitative and deceptive behavior. Alternatively, the results may indicate a difference between females who engage in exploitative and deceptive behavior compared to males. While not an original goal of this research it is an important area to address in future investigations.

An additional concern of the consequences of the current study's non-representative sample is the non-significant finding of the state self-regulation manipulation on cheating. Meaning, because females differ from males in many ways that are relevant to exploitative and deceptive behavior, females may possess traits that modify the effect of self-regulation taxation on cheating. Research, for example Gino et al. (2011) has demonstrated moral identity can act as a moderator in this relationship. In

Gino et al. (2011) only individuals low in moral identity cheated when their self-regulation resources had been depleted. For individuals high in moral identity the self-regulation depletion task had no such effect. Furthermore, Barriga, Morrison, Liau, and Gibbs (2001) found that moral self-relevance (i.e., how being moral is relevant to one's conception of self) which shares many of the same features as moral identity was greater in females than males. The study which consisted of college students ages 16 to 19, also found females had lower antisocial behavior as measured by the Youth Self-Report Form, a self-report compliment to the Child Behavior Checklist. Therefore, because females may be higher in moral self-relevance and moral identity has been shown to moderate state self-regulation manipulations, the overrepresentation of females may account for the current study's non-significant findings for state self-regulation. Furthermore, life history theory would predict a relationship between moral identity and life history strategy whereby faster life history strategists would have lower moral identity and slower life history strategists would have higher moral identity. This is because having a higher moral identity is facilitative of a slow life history strategy. The overrepresentation of females has significance for this relationship as well because not only has past research (e.g., Figueredo et al., 2005b) found females to have a slower life history strategy than males, but that effect is replicated in the current findings with a significant correlation between life history strategy and sex, $r(130) = .26, p = .003$. Meaning, because females tend to have a slower life history strategy, life history theory would predict higher moral identity for slower life history strategists, females are more likely to have a higher moral identity, and females are overrepresented in this study.

This may further account for the findings not only for state self-regulation but the life history and trait self-regulation interaction as well. For future research a more diverse sample not consisting of college students who are mostly female, is recommended for replication of state self-regulation manipulations as well as to facilitate more generalizable conclusions. In addition to this limitation, there may exist a statistical limitation based on overdispersion in the model.

Overdispersion as defined by Crawley (2002) occurs when the residual deviance is greater than the residual degrees of freedom. Overdispersion is common in generalized linear models and is something that should be considered because the consequence of not doing so is biased parameter estimates and increase in Type I errors. Overdispersion can be evaluated using a number of indicators including the Pearson chi square goodness of fit. However, there is no general agreement on what value indicates an unacceptable degree of overdispersion. For example McCullagh and Nelder (1989) evaluate it as being a value near 2 or greater, while Anderson, Burnham, and White (1994) suggest values from 1 to 3 are typical and modeling of overdispersion is unnecessary unless values from 5 to 10 are present. In this research a value of 2.02 was found which indicates at least some overdispersion is present, however using the criteria from Anderson et al. (1994) this is an acceptable degree of overdispersion. However, assuming the more conservative criteria, additional steps were taken to further evaluate overdispersion. One remedy to overdispersion is to use a different distribution however, in this research the most theoretically sound distribution was a binomial distribution with a specified number of trials. To evaluate the potential

problem of overdispersion several different distributions were tested including a poisson distribution and a negative binomial distribution using maximum likelihood estimation. The distribution that resulted in the best fit was the negative binomial distribution. However, as the requirements of this distribution were not met and more importantly regardless of which distribution was used the significance of effects did not change, the binomial distribution was retained. Therefore, while some overdispersion existed, regardless of which criteria are used to evaluate overdispersion, it appears it was not problematic enough to severely change the parameter estimates and there should be no subsequent increase in Type I errors. While this research complemented past work on self-regulation, life history, and more broadly exploitative and deceptive strategies, future research may benefit from using a measure of cheating or exploitative and deceptive behavior which is indicative of more serious cheating behavior while retaining the observational component. This is not easily achieved, however, if researchers are to understand and apply theory in a practical context (e.g., in a criminal justice setting) future research may want to incorporate additional methods of measurement outside of self-report and current laboratory cheating paradigms.

Conclusion

This research tested life history theory, attempted to explain both state and trait self-regulation, and further our understanding of cheating behavior. While several limitations exist the current findings indicate support for life history theory and furthered our understanding of the role self-regulation plays in cheating behavior. In

addition, the cheating methodology and the implementation of the Spector Pro software not only complement existing cheating paradigms but offer several advantages, for example, a reduction in the total number of participants (compared to having self-scored and experimenter scored conditions) and a more direct observation of cheating behavior. Further research will be required to understand the relationship between trait and state self-regulation. Incorporating the distal causal framework of life history may aid future research endeavors in self-regulatory behavior.

APPENDIX

Appendix

Demographic Questionnaire

Instructions:

Please respond to each of the following items to the best of your ability. There are no “right” or “wrong” answers to the questions – we are only interested in your own personal thoughts and opinions, which will be completely anonymous.

Demographics

1. How old are you? ____ years old

2. What is your sex? Male ____ Female ____

3. What is your ethnicity (check one)?

____ White (Caucasian/European or European American) ____ Caribbean Islander

____ Mexican or Mexican American

____ Asian or Pacific Islander

____ Other Latina or Latin American

____ Multi-ethnic

____ Black or African American

____ Other

____ Native American/Alaskan Native

4. Highest level of education completed (check one)

____ Less than high school

____ Bachelor Degree

___ High School Diploma/GED

___ Master's Degree

___ Associates Degree

___ Doctoral Degree

5a. What is your religious affiliation?

5b. How strong are your religious beliefs? (select the number that best reflects you):

1 2 3 4 5 6 7

Not at all

Very

strong

strong

6. Are you a U.S. Citizen? _____ Yes _____ No

6a. If you are not a U.S. Citizen, how long have you lived in the U.S.?

_____ Years _____ Months

7. What is your political orientation? (select the number that best reflects you):

1 2 3 4 5 6 7

liberal

conservative

Arizona Life History Battery

Please indicate how strongly you agree or disagree with the following statements. Use the scale below and write your answers in the spaces provided. For any item that does not apply to you, please enter "0".

Disagree Strongly	Disagree Somewhat	Disagree Slightly	Don't Know / Not Applicable	Agree Slightly	Agree Somewhat	Agree Strongly
-3	-2	-1	0	+1	+2	+3

MINI-K

	1. I can often tell how things will turn out.
	2. I try to understand how I got into a situation to figure out how to handle it.
	3. I often find the bright side to a bad situation.
	4. I don't give up until I solve my problems.
	5. I often make plans in advance.
	6. I avoid taking risks.
	7. While growing up, I had a close and warm relationship with my biological mother.
	8. While growing up, I had a close and warm relationship with my biological father.
	9. I have a close and warm relationship with my own children.
	10. I have a close and warm romantic relationship with my sexual partner.
	11. I would rather have one than several sexual relationships at a time.
	12. I have to be closely attached to someone before I am comfortable having sex with them.
	13. I am often in social contact with my blood relatives.
	14. I often get emotional support and practical help from my blood relatives.
	15. I often give emotional support and practical help to my blood relatives.
	16. I am often in social contact with my friends.
	17. I often get emotional support and practical help from my friends.
	18. I often give emotional support and practical help to my friends.
	19. I am closely connected to and involved in my community.
	20. I am closely connected to and involved in my religion.

Please indicate how strongly you agree or disagree with the following statements. Use the scale below and write your answers in the spaces provided. For any item that does not apply to you, please enter "0".

<i>Disagree Strongly</i>	<i>Disagree Somewhat</i>	<i>Disagree Slightly</i>	<i>Don't Know / Not Applicable</i>	<i>Agree Slightly</i>	<i>Agree Somewhat</i>	<i>Agree Strongly</i>
-3	-2	-1	0	+1	+2	+3

INSIGHT, PLANNING, AND CONTROL

1.	I can head off a bad situation before it happens.
2.	I can sense when an opportunity is coming my way
3.	I am good at predicting what is going to happen to me.
4.	I am good at figuring out how things will turn out.
5.	Making sense of my past helps me figure out what to do in the future.
6.	After something bad happens, I think about how I could have prevented it.
7.	I try to make sense of the things that have happened to me.
8.	I have had new insights into the way things have turned out.
9.	When things don't go according to my plans, my motto is, "Where there's a will, there's a way."
10.	When faced with a bad situation, I do what I can to change it for the better
11.	Even when I feel I have too much to do, I find a way to get it all done.
12.	When I encounter problems, I don't give up until I solve them.
13.	I rarely give up on things I'm doing, even when things get tough.
14.	I find I usually learn something meaningful from a difficult situation.
15.	When I am faced with a bad situation, it helps to find a different way of looking at things.
16.	Even when everything seems to be going wrong, I can usually find a bright side to the situation.
17.	I can find something positive even in the worst situations.
18.	I like to make plans for the future.
19.	I know what I want out of life.
20.	I find it helpful to set goals for the near future.

Please rate the following characteristics of your *biological* parents (not *adoptive* or *step* parents) during the years you were growing up. (If the question is not applicable because, for example, you had no contact with your *biological* father, enter "0")

- 0 = Not at all
- 1 = A little
- 2 = Some
- 3 = A lot

MOTHER/FATHER RELATIONSHIP QUALITY

Please rate the following characteristics of your <i>biological</i> parents		Mother		Father
How much did they understand your problems and worries?	1		14	
How much could you confide in them about things that were bothering you?	2		15	
How much love and affection did they give you?	3		16	
How much time and attention did they give you when you needed it?	4		17	
How much effort did they put into watching over you and making sure you had a good upbringing?	5		18	
How strict were they with their rules for you?	6		19	
How consistent were they about the rules?	7		20	
How harsh were they when they punished you?	8		21	
How much did they stop you from doing things that other kids your age were allowed to do?	9		22	
How much did they expect you to do your best in everything you did?	10		23	
How much did they teach you about life?	11		24	
How generous and helpful were they to people not in the family?	12		25	
How social and friendly were they to people not in the family?	13		26	

The following questions are about your *blood* relatives (for example, your *biological* parents, brothers, sisters, uncles, aunts, and cousins) and friends and the time that you spend with them. (If any question is not applicable because, for example, you have no contact with your *blood* relatives, enter "0").

- 0 = Not at all
- 1 = A little

2 = Some
3 = A lot

FAMILY/FRIENDS CONTACT

During the last twelve months, about how many times...		Relatives		Friends
Have you seen them?	1.		6.	
Have they come to your house?	2.		7.	
Have you gone to visit them at home?	3.		8.	
Have you met with them in another place, for example, in a park, a bar, or a party?	4.		9.	
Have you spoken with them on the telephone or communicated with them over the internet?	5.		10.	

The following are some questions about means of help that people offer each other. How often has any family member or friend helped you in each of the following ways?

0 = Not at all
1 = A little
2 = Some
3 = A lot

FAMILY/FRIENDS SUPPORT

During the last month, about how many times have they...		Relatives		Friends
Helped you get worries off your mind?	11.		21.	
Told you that you had done something well?	12.		22.	
Told you that they liked the way you are?	13.		23.	
Given you money?	14.		24.	
Shown you affection?	15.		25.	
Offered to take you somewhere?	16.		26.	
Listened to you when you talked about your feelings?	17.		27.	
Shown interest and concern for your well-being?	18.		28.	
Taken care of someone in your family when you were out?	19.		29.	
Offered you a place to stay for a while?	20.		30.	

The following statements concern how you feel in romantic relationships. We are interested in

how you generally experience relationships, not just in what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it. Write the number in the space provided, using the following rating scale:

-3	-2	-1	0	+1	+2	+3
Strongly Disagree	Disagree	Mildly Disagree	Neutral (Neither)	Mildly Agree	Agree	Strongly Agree

EXPERIENCES IN CLOSE RELATIONSHIPS

1.	I prefer not to show a partner how I feel deep down.
2.	I worry about being abandoned.
3.	I am very comfortable being close to romantic partners.
4.	I worry a lot about my relationships.
5.	Just when my partner starts to get close to me I find myself pulling away.
6.	I worry that romantic partners won't care about me as much as I care about them.
7.	I get uncomfortable when a romantic partner wants to be very close
8.	I worry a fair amount about losing my partner.
9.	I don't feel comfortable opening up to romantic partners.
10.	I often wish that my partner's feelings for me were as strong as my feelings for him/her.
11.	I want to get close to my partner, but I keep pulling back.
12.	I often want to merge completely with romantic partners, and this sometimes scares them away.
13.	I am nervous when partners get too close to me.
14.	I worry about being alone.
15.	I feel comfortable sharing my private thoughts and feelings with my partner.
16.	My desire to be very close sometimes scares people away
17.	I try to avoid getting too close to my partner.

	18	I need a lot of reassurance that I am loved by my partner.
	19	I find it relatively easy to get close to my partner
	20	Sometimes I feel that I force my partners to show more feeling, more commitment.
	21	I find it difficult to allow myself to depend on romantic partners.
	22	I do not often worry about being abandoned.
	23	I prefer not to be too close to romantic partners.
	24	If I can't get my partner to show interest in me, I get upset or angry.
	25	I tell my partner just about everything.
	26	I find that my partner(s) don't want to get as close as I would like.
	27	I usually discuss my problems and concerns with my partner.
	28	When I'm not involved in a relationship, I feel somewhat anxious and insecure.
	29	I feel comfortable depending on romantic partners.
	30	I get frustrated when my partner is not around as much as I would like.
	31	I don't mind asking romantic partners for comfort, advice, or help.
	32	I get frustrated if romantic partners are not available when I need them.
	33	It helps to turn to my romantic partner in times of need.
	34	When romantic partners disapprove of me, I feel really bad about myself.
	35	I turn to my partner for many things, including comfort and reassurance.
	36	I resent it when my partner spends time away from me

Please indicate how strongly you agree or disagree with the following statements. Use the scale below and write your answers in the spaces provided. For any item that does not apply to you, please enter "0".

Disagree Strongly	Disagree Somewhat	Disagree Slightly	Don't Know / Not Applicable	Agree Slightly	Agree Somewhat	Agree Strongly
-3	-2	-1	0	+1	+2	+3

ALTRUISM TOWARDS OWN CHILDREN

	1. I have a positive overall relationship with my children these days.
	2. I have had a positive overall relationship with my children in the past.
	3. I expect to have a positive overall relationship with my children in the future.
	4. I put a great deal of thought and effort into my overall relationship with my children nowadays.
	5. I always drop my plans when my children seem troubled.
	6. I frequently call, write, or visit my adult children.
	7. I would take my divorced or unemployed adult child back into my home.
	8. I spend a great deal of time per month giving informal emotional support to my children.

ALTRUISM TOWARDS OWN KIN

	1. I always drop my plans when my blood relatives seem distressed.
	2. I frequently call, write, or visit my blood relatives.
	3. I would take my divorced or unemployed adult blood relatives back into my home.
	4. I spend a great deal of time per month giving informal emotional support to my blood relatives.
	5. I contribute a great deal to the welfare and well-being of my blood relatives in the present.
	6. I had a large contribution to the welfare and well-being of my blood relatives in the past.
	7. I expect to have a major contribution to the welfare and well-being of my blood relatives in the future.

Please indicate how strongly you agree or disagree with the following statements. Use the scale below and write your answers in the spaces provided. For any item that does not apply to you, please enter "0".

Disagree Strongly	Disagree Somewhat	Disagree Slightly	Don't Know / Not Applicable	Agree Slightly	Agree Somewhat	Agree Strongly
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-3	-2	-1	0	+1	+2	+3
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ALTRUISM TOWARDS FRIENDS

	1. I have important skills I can pass along to others.
	2. Many people come to me for advice.
	3. I frequently teach things to people.
	4. Other people often come to me when they are in need of assistance/support/etc..
	5. I have a good influence on the lives of many people.
	6. I would raise the child of a close friend if the friend died unexpectedly.
	7. I would take a friend into my home if they could not afford to live alone.
	8. I have frequently given money to a friend in need, even if this made it hard to meet my own needs.
	9. I would never cancel plans to visit friends when I am asked, but not required, to work overtime.
	10. I spend a great deal of time per month giving informal emotional support to casual acquaintances (such as neighbors or people at church).
	11. I contribute a great deal to the welfare and well-being of my friends these days.
	12. I made a large contribution to the welfare and well-being of my friends in the past.
	13. I expect to make a major contribution to the welfare and well-being of my friends in the future.
	14. I put a great deal of thought and effort into my contribution to the welfare and well-being of friends these days.

Please indicate how strongly you agree or disagree with the following statements. Use the scale below and write your answers in the spaces provided. For any item that does not apply to you, please enter "0".

Disagree Strongly	Disagree Somewhat	Disagree Slightly	Don't Know / Not Applicable	Agree Slightly	Agree Somewhat	Agree Strongly
-3	-2	-1	0	+1	+2	+3

ALTRUISM TOWARDS COMMUNITY

	1. I have made unique contributions to society.
	2. I would serve on a jury if called for duty, or have served before.
	3. I keep fully informed about national news and public issues.
	4. I would testify in court about an accident I witnessed.
	5. I usually vote in local and national elections.
	6. I do more than most people would do in my kind of job.
	7. I would work hard even if I didn't like or respect my employer or supervisor.
	8. I would pay more for my health care so that everyone had access to health care.
	9. I frequently volunteer time or money to social causes that I support.
	10. I would collect contributions for heart or cancer research if asked to do so.
	11. I would vote for a law that would help others worse off than me but would increase my taxes.
	12. I spend a great deal of time per month doing formal volunteer work at hospital, nursing home, or other health-care-oriented institution.
	13. I spend a great deal of time per month doing formal volunteer work at school or other youth-related institution.
	14. I spend a great deal of time on a monthly basis doing formal volunteer work for political organizations or causes.
	15. I spend a great deal of time per month doing formal volunteer work for any other organizations, causes or charities.
	16. I attend many meetings of unions or other professional groups.
	17. I attend many meetings of sports or social groups.
	18. I attend most meetings of any other groups (not including any required by my job).
	19. I often contribute to individuals (not organized groups), including people on the street, asking for money.
	20. I often contribute to political organizations or causes.
	21. I often contribute to any other organizations, causes, or charities (including donations made through monthly payroll deductions).

Please indicate how strongly you agree or disagree with the following statements. Use the scale below and write your answers in the spaces provided. For any item that does not apply to you, please enter "0".

Disagree Strongly	Disagree Somewhat	Disagree Slightly	Don't Know / Not Applicable	Agree Slightly	Agree Somewhat	Agree Strongly
-3	-2	-1	0	+1	+2	+3

RELIGIOSITY

1.	I'm a very religious person.
2.	I'm a very spiritual person.
3.	Religion is important in my life.
4.	Spirituality is important in my life.
5.	It is or will be important for me to send my children to religious or spiritual services or instruction.
6.	I closely identify with being a member of my religious group.
7.	I prefer to be with other people who belong to the same religion as me.
8.	It was or will be very important for me to marry someone who belongs to my religion.
9.	I frequently attend religious or spiritual services.
10.	I frequently seek comfort through religious or spiritual means, such as praying, meditating, attending a religious or spiritual service, or talking to a religious or spiritual advisor.
11.	When I have decisions to make in my daily life, I often ask myself what my religious or spiritual beliefs suggest I should do.
12.	I frequently attend religious services.
13.	I frequently attend meetings of religious groups.
14.	I often receive unpaid assistance from religious groups.
15.	I devote much of my income towards contributions to religious groups.
16.	I receive much of my income from religious groups.
17.	Religion was a major influence in my home when I was growing up.

Behavioral Rating Inventory of Executive Function

On the following pages is a list of statements. We would like to know if you have had problems with the behaviors over the past month. Please answer all the items the best that you can. Please DO NOT SKIP OVER ANY ITEMS. Use the scale below and write your answers in the spaces provided.

Never	Occasionally	Sometimes	Often	Very Often	Frequently	Almost Always
0	1	2	3	4	5	6

01. _____ I have angry outbursts
02. _____ I tap my fingers or bounce my legs
03. _____ I need to be reminded to begin a task even when I am willing
04. _____ I have trouble changing from one activity or task to another
05. _____ I overreact emotionally
06. _____ I don't notice when I cause others to feel bad or get mad until it is too late
07. _____ I have trouble sitting still
08. _____ I have emotional outbursts for little reason
09. _____ I have trouble accepting different ways to solve problems with work, friends, or tasks
10. _____ I talk at the wrong time
11. _____ I react more emotionally to situations than my friends
12. _____ I have problems waiting for my turn
13. _____ I have trouble thinking of a different way to solve a problem when stuck
14. _____ I overreact to small problems
15. _____ I make inappropriate sexual comments
16. _____ When people seem upset with me, I don't understand why
17. _____ I get emotionally upset easily
18. _____ I make decisions that get me into trouble (legally, financially, socially)
19. _____ I am bothered by having to deal with changes
20. _____ I say things without thinking
21. _____ My anger is intense but ends quickly
22. _____ People say that I am easily distracted
23. _____ People say that I am too emotional
24. _____ I rush through things
25. _____ People say that I don't think before acting
26. _____ After having a problem, I don't get over it easily
27. _____ My mood changes frequently
28. _____ I don't think about consequences before doing something
29. _____ I get upset quickly or easily over little things
30. _____ I am impulsive

Experimental Manipulation Writing Task (Taxation)

On the following pages, please describe what you did yesterday. You will have 5 minutes for this task. Make sure you write for the entire time.

which is 5 minutes. Therefore, we will not need to save your results. To clear the document for the next participant, close the program when you are finished and when the computer asks you if you want to save select, "No".

Example:

What you see

1.69	1.82	2.91
4.67	3.81	3.05
5.82	5.06	4.28
6.36	6.19	4.57

Found it

What you do

1.69	1.82	2.91
4.67	3.81	3.05
5.82	5.06	4.28
6.36	6.19	4.57

Found it

When time is up:

1. Stop the timer
2. Count the number of matrixes correctly solved and write it on collection slip and answer the last two questions on that same paper
3. Close the program making sure to click "No" when asked if you want to save
4. Exit the room and then the experimenter will pay you

7.17	4.89	7.76
5.66	1.86	5.11
9.83	5.95	4.25
7.01	6.28	3.82

Found it

1.69	2.32	7.93
1.93	9.1	4.63
2.79	4.86	1.19
9.52	5.37	5.57

Found it

5.97	9.62	9.41
3.6	7.4	7.01
5.49	0.59	2.62
7.51	5.71	0.49

Found it

6.1	7.01	3.97
0.97	4.46	9.82
3.07	2.92	8.56
1.12	6.93	9.12

Found it

1.63	2.11	5.36
0.53	2.17	9.3
7.31	2.29	9.46
3.1	6.52	2.69

Found it

2.92	4.98	4.34
0.39	0.72	5.53
9.61	3.57	3.36
6.8	0.53	8.58

Found it

4.74	4.78	0.83
1.61	5.97	4.09
5.96	3.29	9.09
0.89	9.17	2.71

Found it

9.43	7.04	2.21
5.49	3.8	5.82
4.18	9.41	7.5
7.13	4.26	8.8

Found it

6.21	2.47	9.57
1.68	9.52	4.52
8.7	7.69	1.47
6.4	4.44	8.32

Found it

0.07	7.75	8.78
7.22	6.01	3.93
2.25	0.77	3.53
7.89	0.55	0.18

Found it

0.93	1.6	2.23
0.22	5.11	9.28
3.91	1.35	2.41
1.35	8.65	3.97

Found it

3.08	9.42	5.87
3.94	5.41	3.42
4.02	5.06	4.12
4.13	4.65	2.86

Found it

1.57	5.94	3.17
1.11	3.97	2.33
6.99	0.13	8.89
0.85	3.7	0.08

Found it

0.74	4.55	3.19
8.51	7.91	8.68
5.62	0.81	2.15
3.75	3.72	2.09

Found it

9.38	8.17	6.68
6.61	3.06	9.7
4.88	8.21	3.39
6.71	4.87	6.42

Found it

8.17	7.29	7.27
0.55	4.14	5.42
8.48	9.55	8.71
6.56	5.86	0.23

Found it

2.22	4.5	7.13
9.33	9.77	5.96
7.04	4.04	5.22
2.28	1.72	8.16

Found it

2.16	4.51	1.66
8.29	8.05	9.03
4.73	7.84	9.86
5.21	3.94	7.18

Found it

9.4	6.51	8.33
0.58	8.55	8.63
5.42	3.54	4.7
6.46	7.43	4.56

Found it

4.73	2.12	8.99
0.63	8.89	9.33
1.02	2.34	4.98
1.11	0.65	2.02

Found it

Positive And Negative Affect Schedule

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way now.

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
_____ cheerful	_____ sad	_____ active	_____ angry at self	
_____ disgusted	_____ calm	_____ guilty	_____ enthusiastic	
_____ attentive	_____ afraid	_____ joyful	_____ downhearted	
_____ bashful	_____ tired	_____ nervous	_____ sheepish	
_____ sluggish	_____ amazed	_____ lonely	_____ distressed	
_____ daring	_____ shaky	_____ sleepy	_____ blameworthy	
_____ surprised	_____ happy	_____ excited	_____ determined	
_____ strong	_____ timid	_____ hostile	_____ frightened	
_____ scornful	_____ alone	_____ proud	_____ astonished	
_____ relaxed	_____ alert	_____ jittery	_____ interested	
_____ irritable	_____ upset	_____ lively	_____ loathing	
_____ delighted	_____ angry	_____ ashamed	_____ confident	
_____ inspired	_____ bold	_____ at ease	_____ energetic	
_____ fearless	_____ blue	_____ scared	_____ concentrating	
_____ disgusted with self	_____ shy	_____ drowsy	_____ dissatisfied with self	

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