Does Higher Self-Control Predict Higher State-Orientation and Negative Self-Referential Emotions? A Mixed Methods Study.

by

Dean O. Hayes

A dissertation submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy in Counseling Psychology

Auburn, Alabama
December 14, 2019

Keywords: Self-control, self-regulation, ego-fixation, negative self-referential emotions

Approved by

Marilyn Cornish, Chair, Associate Professor of Counseling Psychology
Han Na Suh, Assistant Professor of Counseling Psychology
Jill Meyer, Associate Professor of Special Education, Rehabilitation, and Counseling
Malti Tuttle, Assistant Professor of Special Education, Rehabilitation, and Counseling

Abstract

Trait self-control has been evaluated overwhelmingly as desirable, but only limited research has investigated the negative trade-offs associated with exercising self-control. This paper uses mixed methods to explore potentially negative side effects of self-control. A sample of 308 college students was given the Self-Control Scale, the Guilt and Shame Proneness Scale, and the Action-Control Scale. Afterwards, a group of 12 participants were interviewed, with transcriptions coded using a grounded theory approach. Self-control was found to correlate positively with action-orientation and with the affective experience of negative self-referential emotions. Self-control was found to correlate positively with guilt behaviors, but negatively with shame behaviors. The linear regression model with self-control as the independent variable was found to account for additional variance after accounting for social desirability in all cases except that of shame-withdrawal, and the quadratic model was found to account for more variance than the linear model regarding one subscale of action-control. Participants provided descriptions of their experience of self-control in the qualitative interviews. Participants presented reminding themselves of their primary goals as a key technique for facilitating self-control and presented self-alienation as a potential negative side effect. Implications and applications to counseling psychology are discussed.

Table of Contents

List of Tables

I. Introduction

"Self-control is the exertion of control over the self by the self" (Muraven & Baumeister, 2000, p. 247). Defined more specifically, self-control is an executive function that allows a person to inhibit impulses in the presence of temptations (Diamond, 2013; Jones, Lynam, & Piquero, 2011). Self-control has been correlated positively with well-being and life satisfaction (Hofmann, Luhmann, Fisher, Vohs, & Baumeister, 2014), as well as with good adjustment, less pathology, better grades, and interpersonal success (Tangney, Baumeister, & Boone, 2004). Self-control has also been positively correlated with mindfulness (Bowlin & Baer, 2012), a construct that is itself further correlated with a number of positive outcomes. The construct is normally appraised as an entirely desirable trait or ability; although the concept of "overcontrolled" individuals has negative connotations and may bring to mind non-clinical levels of perfectionism or disorders such as OCD, it is notable that these conditions, which are associated with difficulties inhibiting impulses, are in fact according to this model more easily conceptualized as due to insufficient self-control (Hofmann et al., 2014).

On the other hand, lack of self-control, or impulsivity, defined as the tendency to pursue short-term goals without attention paid to the consequences of their fulfillment, is correlated with psychological distress and lower well-being (Bauer, Wilkie, Kim, & Bodenhausen, 2012; Rosenberg, 2004). Low self-control is also correlated with a number of antisocial behaviors, including drug use, violence, and truancy (Cauffman, Steinberg, & Piquero, 2005; Finkenauer et al., 2015; Watkins, DiLillo, Hoffman, & Templin, 2013). Low self-control has also been correlated with victimization and poverty (Bernheim, Ray, & Yeltekin, 2015; Pratt, Turanovic, Fox, & Wright, 2014; Turanovic & Pratt, 2012).

Thus, just as self-control is generally regarded as an almost entirely desirable trait, so its opposite, impulsivity, is regarded as entirely negative.

The dominant model of self-control in psychological research holds that exercising self-control depletes a limited resource, resulting in *ego depletion,* during which time the person exhibits worsened self-control (Hagger, Wood, Stiff, & Chatzisarantis, 2010; Muraven & Baumeister, 2000). This period of ego depletion can be avoided, delayed, or shortened using a number of techniques, such as by altering thoughts related to the temptation or by interventions aimed at altering physiology, such as by raising blood sugar (Friese, Messner, and Schaffner, 2012; Job, Walton, Bernecker, & Dweck, 2013; Tice, Baumeister, Shmueli, & Muraven, 2007). Many strategies used to improve self-control focus on attenuating the effects of ego depletion (Duckworth et al., 2015; Inzlicht, Legault, & Teper, 2014; Piquero, Jennings, Farrington, Diamond, & Gonzalez, 2016). Among these, the most effective ameliorate fatigue, such as through improving sleep habits (Diestel, Rivkin, & Schmidt, 2015).

While the vast majority of research on self-control has considered it as an overwhelmingly desirable trait, some researchers have hinted at negative side effects associated with high trait self-control. Research that investigates the negative correlates of self-control is comparatively less developed and more conjectural than is research focused on the benefits. First, those high in self-control may be more prone to what Koole et al. (2012) and Kuhl and Beckmann (1994) refer to as "emotional alienation" and a condition termed "ego-fixation," in which the person exercising self-control is unable to re-access inhibited stimuli even after a self-control task has ended. Those especially prone to this effect include state-oriented individuals, that is, people who have difficulty

alternating among tasks and moving on once a task is completed (Koole et al., 2012). A disturbing implication of these results is that, because much of the research on self-control and well-being is based on self-report measures, it is possible that those high in self-control, instead of experiencing a greater level of actual well-being, are actually better at ignoring negativity in their lives, thus better able to dwell in a state of perpetual inflation regarding their self-worth and the goodness of their lives. Although they may earn more money on average and have fewer drug and legal problems, there remains the possibility that their internal psychological states are as stormy or stormier than those of the general population, even though they be unable or unwilling to admit this fact to researchers or even to themselves, requiring research on the topic to control for defensive responses.

A second potential negative correlate with self-control—one perhaps contrary to the bulk of research—is proposed by Inzlicht and Legault (2014), who assert that some degree of distress is essential to effective self-control. They posit that, because self-control is the ability to choose a long-term goal at the expense of tempting albeit ultimately less desirable alternatives, the person must exist in a state of internal conflict for multiple desires. Concomitant with this conflict is psychological distress. They note that while such distress may not cause measurably greater anxiety, as it does not induce a measurable behavioral fear or worry response, it nonetheless increases or is concomitant with negative affect related to personal expectations and preoccupation with goal gratification. They theorize that such negative emotions would be self-referential and hence detectable using measures of sensitivity to shame or guilt. It is notable that Tangney et al. (2004) included a measure of self-conscious affect in their extensive

battery; however, the measure used (the Test of Self-Conscious Affect-3) confounds emotional and behavioral reactions to stimuli. Thus, though high self-control individuals may have responded to the stimulus prompts in a way that would reflect adaptive behaviors, it remains unclear whether high trait self-control individuals still experience intense internal conflict, including increased internal shame. To measure this tendency would require a measure that differentiates between behavioral and affective components of shame. Research has demonstrated that, in general, behavioral and affective components of emotion tend to correlate, while physiological responses correlate to a lesser extent (Mauss et al., 2005). Measures have been developed to measure both behavioral and affective components of guilt and shame specifically (Tangney, 1996).

In summation, while the construct of self-control has been lauded extensively as a mostly desirable trait even when considered to any possible extent (DeWall et al., 2014; Duckworth & Gross, 2014; Hagger et al., 2010; Hofmann et al., 2014; Tangney et al., 2004), fewer studies have investigated the negative attributes of trait self-control (Koole et al., 2012). What has received less attention still is whether there is a point beyond which self-control, defined as the ability to inhibit impulses, is plainly harmful, such as by causing the person psychological distress. The present work seeks to identify more holistic implications of high trait self-control using mixed methods. Using self-report measures and analyzing the responses using hierarchical linear regression, I will identify potential points at which extreme self-control is correlated with undesirable traits and tendencies, investigating specifically whether higher trait self-control is correlated with greater state-orientation. Further, I will determine whether trait self-control is correlated with sensitivity to shame and pride. Finally, I investigate self-control from the

perspective of the participants themselves, who likely have insights into how self-control can be wielded most effectively, as well as the detriments of excessive self-control.

Rationale

The full spectrum of characteristics associated with higher trait self-control has not been identified. Particularly, self-control has been regarded with a bias toward desirable traits or skills, and regimens and training programs have been developed to improve self-control (Duckworth et al., 2014; Inzlicht et al., 2014; Miles et al., 2016; Piquero et al., 2016), though it has not been determined as of yet that there exists a point beyond which such improvement strategies may actually become harmful. Furthermore, even in situations where self-control is useful, the dominant model of self-control, the *strength model,* holds that self-control is a limited resource and that its continued application will eventually result in a period of worse self-control, during which time people are at a higher risk of impulsivity. It is possible that by using qualitative research methods to study how people intuitively exercise self-control, one may simultaneously elucidate negative side-effects of self-control and identify efficient means of avoiding or shortening ego depletion, resulting in a fuller understanding of the construct and its application to improved well-being.

Significance to Counseling Psychology

Self-control has been positively correlated with measures of well-being, life satisfaction, and interpersonal success. Thus, practitioners of psychotherapy may be able to improve their patients' well-being by assisting them with self-control improvement techniques. However, it is still unclear if there is a useful limit to such techniques and if progress beyond that limit produces new forms distress. This dissertation serves as a

developmental step in a project through which psychotherapists will be better able to determine the logical extent beyond which more self-control training will no longer be helpful. Finally, therapists who are aware of the undesirable correlates of self-control will be better able to identify these effects among patients whom they identify as possessing high trait self-control, thus more effectively treating these side-effects in cases in which a client already possesses high trait self-control.

Operational Definitions

Self-control: "The exertion of control over the self by the self" (Muraven & Baumeister, 2000, p. 247). When contrasted with self-regulation, self-control is an executive function that allows a person to inhibit impulses in the presence of temptations, while self-regulation implies more global executive function. Self-control will be operationalized as the score obtained on the Self-Control Inventory (Tangney et al., 2004).

Emotional alienation: State in which an individual is unaware of his or her desires or emotional state (Koole et al., 2014).

State-orientation: Tendency for an individual to act hesitantly and afterward to tend to remain preoccupied with the task, reflecting on performance and outcomes. This is opposed to action-orientation. State-orientation implies affective rigidity and emotional alienation. State-orientation will be operationalized as the score obtained on the Action Control Scale (Kuhl & Fuhrmann, 1998).

Self-conscious Affect: Negative social emotions, especially guilt and shame. Each self-conscious affect will be operationalized as the score obtained on the Guilt and Shame Proneness Scale (Cohen, Wolf, Panter, & Insko, 2011). Each subscale will be evaluated

separately: Negative behavior evaluation (guilt), repair tendency (guilt), negative self-evaluation (shame) and withdrawal tendency (shame).

Self-Deception: Form of socially desirable responding in which a person, often unconsciously, exaggerates their abilities. Self-deception will be measured using the corresponding subscale of the Balanced Inventory of Desirable Responding (Paulhus, 1988; 1991).

Impression Management: Form of socially desirable responding in which a person consciously attempts to appear more desirable to a researcher. Impression management will be measured using the corresponding subscale of the Balanced Inventory of Desirable Responding (Paulhus, 1988; 1991).

Research Questions

Q1. Will trait self-control positively correlate with state-orientation, thus implying a correlation with ego-fixation?

Q2. Will self-control also correlate positively with internal shame and guilt?

Q3. How will the participants conceptualize their self-control abilities, and how will they conceptualize perceived failures in their self-control?

Hypotheses

H1. Trait self-control will be a unique predictor for state-orientation as measured by the Action Control Scale (with subscales Preoccupation Subsequent to Failure, Decision-Related Hesitation, and Volatility during Performance of Activities) above and beyond self-deception and impression management, thus implying a relationship with ego-fixation.

H2. Trait self-control will be a unique predictor for internal shame and guilt, as measured by multiple subscales of the Guilt and Shame Proneness Scale (with subscales Negative Behavioral Evaluation, Guilt-Repair, Negative Self-Evaluation, and Shame-Withdrawal), above and beyond self-deception and impression management.

H3. Participants will be able to provide a qualitative description of their experience of self-control and their experience of perceived failures in self-control. They will have an understanding of any detriments of excessive self-control.

II. Review of the Literature

Self-control

Self-control, along with executive function more generally, allows the individual to make future-oriented decisions at the expense of shortsighted impulses. MacLean et al. (2014) determined that executive function is more developed in non-human animal species that have greater absolute (as opposed to relative) brain volume and, within primates, greater dietary breadth. Interestingly and perhaps counter-intuitively, social group size did not predict better-developed executive function. This finding is in contrast to assertions that self-control serves primarily as a social buffer to ensure that individuals are capable of transcending antisocial temptations for the greater good—while it may serve such a function, MacLean et al.'s results suggest that it may have arisen later and secondarily to the individual's need to organize behaviors in a more general future-oriented fashion.

In contrast to research from the perspective of comparative evolution, Baumeister and Juola Exline (1999) examine self-control from the point of view of morality, considering self-control as the force behind virtue. It is notable that self-control is here considered in a more purely social light. According to their model, (avoidance of) guilt is the goal ensuring respect for social ties over selfish motivations. Although the hypothesis that self-control evolved particularly for social function runs contrary to MacLean et al.'s (2014) evidence, it is indeed clear that self-control has come to serve some social functions extensively, such as helping individuals to avoid exploiting others and thus ultimately facing rejection by the group. Concomitantly, the social and self-referential emotions of guilt, shame, and pride likely feature prominently in individual's appraisal of

successful applications of self-control or their failure. It is plausible that greater sensitivity to long-term social emotional rewards (pride) and punishments (guilt) corresponds to increased trait self-control.

A classic behavioral experiment on self-control is Mischel's "marshmallow experiments" (Mischel, Ebbesen, & Raskoff, 1972; Mischel, 2014). A group of four-year-old children were placed alone in a room with a marshmallow and told that they could eat the marshmallow at any time; however, if they did not eat the marshmallow for fifteen minutes, then they would receive a second marshmallow. Mischel followed up on his participants forty years later and found that the children who were able to delay gratification for fifteen minutes had lower relational conflict, less drug abuse, and less psychological distress. Mischel was also the first experimenter to demonstrate that the participant's attitudes toward the temptation had an effect on his or her self-control: Participants who were told to focus on "cool" features of the marshmallow, such as its shape or texture, showed increased self-control, while participants who were told to think about "hot" features of the marshmallow, such as its stickiness or sweetness, exhibited compromised self-control. It is notable that subsequent research has questioned the replicability of Mischel et al.'s original study—Watts, Duncan, and Quan (2018) state that much of the correlation between a child's delay of gratification and later achievement can be explained by family support, early cognitive ability, and other factors related to home environment. The greatest effect was found to relate to the ability to wait at least 20 seconds, with correlations between greater wait times and later achievement rarely significant.

Duckworth and Steinberg (2015) propose that self-control is composed of two separate processes: "volitional" processes, which include the executive functions of planning and attention, and "impulsigenic" processes, which include reward sensitivity and sensation seeking. They note that it is the former grouping which has been classically regarded as self-control proper, though it is possible that individuals with low volitional abilities but also low impulsigenic and reward sensitivity may behave similarly to high self-control individuals on experimental tasks and therefore receive apparently commensurate scores on measures. Harris, Hare, and Rangel (2013) similarly propose two temporally dissociable processes occurring with the exercise of self-control that parallel Duckworth and Steinberg's model, but using ERP neural imaging: "attentional filtering" and "value modulation." Attentional filtering, a top-down process by which a participant selects an object to which to pay attention, corresponds to Duckworth and Steinberg's volitional process, while the bottom-up value modulation stage, which corresponds to the impulsigenic process, occurs later and consists of the participant's emotional and sensory response to environmental cues. Harris et al. were capable of resolving these two processes temporally, with the first process occurring 150-200 ms poststimulus onset; and the second, 450-650 ms poststimulus onset.

Hofmann, Friese, and Strack (2009) suggest a third model that consists of three factors of self-control: impulsive precursors (most clearly parallel to value modulation), reflective precursors (most clearly parallel to attentional filtering and the construct studied by the bulk of research on self-control), and dispositional boundary conditions, which include environmental cues to temptation. In a two factor model, dispositional boundary conditions and impulsive precursors would likely load onto the same factor, as

they both work in tandem to determine the subject's experience of temptation, such as, for example, the temptation's presence together with the subject's sensitivity to that temptation. It is notable that all three factors are potentially plastic: The reflective element can be modified by altering attention and mnemonic strategies; the sensitivity element, by sensitization and desensitization strategies; and the proximal element, by anticipating and controlling exposure to the temptation. It is feasible that individuals utilize elements from all three factors to some extent, though it is unclear whether those naturally high in self-control use different factors to different extents and what the distribution will consist of.

Models of self-control include the strength model (Hagger et al, 2010; Muraven & Baumeister, 2000) and the process model (Duckworth, Gendler, & Gross, 2014; Inzlicht, Schmeichel, & Macrae, 2013). The strength model, which posits that self-control is fueled by a limited metabolic or neuronal resource, is dominant and supported by a number of studies. According to this model, a period of strenuous application of self-control is followed by a refractory period termed "ego depletion," during which time the person will be more susceptible to temptations or impulses. Research along this line of thought focuses on ways to postpone ego depletion and to shorten the duration of ego depletion. The process model, on the other hand, views ego depletion as illusory and likely explained by the research participant coming to recognize that the goal given to him or her by the experimenter is pointless and subsequently switching goals to conserve strenuous cognitive effort.

Physiological mechanisms. While early literature on self-control was dependent primarily on behavioral measures, more recent trends have elucidated physiological

mechanisms that underlie the phenomenon and techniques for measuring them. One common trend associates blood glucose levels with self-control abilities, arguing that glucose levels provide an indirect means for measuring an essential resource to cognitive functioning (Beedie & Lane, 2012; Molden et al., 2012). Beedie and Lane, however, note that while low blood glucose levels do predict lower self-control, high blood glucose levels do not necessarily predict improved self-control because it is participant motivations that determine the amount of glucose that will actually be expended on self-control tasks. Molden et al. experimentally determine that self-control tasks do not measurably alter blood glucose levels; however, exposing participants to the taste of glucose improves self-control, also without altering actual blood glucose levels.

Another line of research deals with temporal discounting, the tendency for people to prefer smaller, more immediate rewards over larger, more temporally distant rewards. This research often employs the Kirby Delay-Discounting Task (DDT), a self-report measure, often in conjunction with magnetic resonance imaging (MRI; Yu, 2012; Madden & Bickel, 2010). Yu finds that greater delay discounting correlates negatively with right prefrontal subgyral white matter volume and positively with white matter volume in the parahippocampus and hippocampus. Madden and Bickel review more specific experimental finding that relate delay discounting to neural pathways and assert that frontal cortex, hippocampus, and amygdala activity are all correlated with delay discounting tasks. Determining the precise neuronal circuitry involved in self-control is a new and active line of current academic research. The review that follows will highlight other illustrations of physiological mechanisms of self-control.

Temptation and impulsivity. In the context of research on self-control, temptation refers to the impulses being controlled by the subject that would reach only short-term goals (such as immediate gratification) at the expense of a perceived greater value, long-term goal, and impulsivity is regarded as the opposite of self-control. Subjects appear to rank temptations hierarchically, with more desired temptations requiring more self-control to resist (Gul & Pesendorfer, 1999). Along with the amount of desire for the object, the perceived length of time before the subject expects to receive gratification also has an effect on the ability of the subject to resist temptation, with longer-term goals requiring more self-control to maintain in the presence of mutually exclusive temptations. Thus, according to Gul and Pesendorfer's model, more highly desired temptations offered to the detriment of a more long-term goal should require the greatest amount of self-control to resist. Hayashi, Ko, Strafella, and Dagher (2013) found that the neural signal most proportional to subjective cravings for nicotine were located in the medial orbitofrontal cortex, with information that encoded nicotine availability located specifically in the dorsolateral prefrontal cortex. Given that the prefrontal cortex as a whole is associated most closely with executive function in general, these data indicate that temptation and control are two components of a single neurological process as opposed to the inhibition of one brain region by another.

Impulsivity is the tendency to pursue short-term goals without attention paid to the consequences of their acquisition and may be considered as the opposite of self-control. Impulsivity predicts relapse among smokers who are attempting to quit; in fact, the tendency to react impulsively when experiencing emotions is even more highly correlated (but inversely) with relapse than is self-control when considered purely as

attentional filtering (Webb Hooper & Carver, 2016). Impulsivity is inversely correlated with mindfulness (Wittmann et al., 2014), which has itself been correlated with a number of desirable traits, including well-being and improved concentration.

Kasser and Kanner (2004), writing on consumerism, a construct related to habitual impulsivity, found that acquisitive tendencies correspond to decreased well-being. For example, people presented with a series of consumer items began to experience negative affect. While consumerism is a broader construct than impulsivity and includes connotations of materialism, it nonetheless serves as a model for the consequences of one form of impulsivity.

The effect of temptation in some ways depends upon the attitudes of the participant toward those temptations (Ghoniem & Hofmann, 2016). Ent, Baumeister, and Tice (2015) found that participants high in trait self-control are more likely to avoid temptations altogether when compared to a low trait self-control group. That is, those high in self-control are less likely to place themselves in tempting situations, thus further maximizing the self-control that they have available. This technique corresponds to Hofmann et al.'s (2009) dispositional boundary conditions, suggesting that removing oneself from temptation or avoiding temptations altogether play a special role in self-control. This prevents the need for self-control before it even arises, thus preserving resources for other applications.

Ego depletion. The strength model of self-control posits that acts of self-control draw from a common global resource. Continued acts of self-control deplete that resource, leading to decrements in the performance of subsequent acts of self-control. This state of depleted self-control has been termed *ego depletion* (Hagger et al. 2010;

Muraven & Baumeister, 2000). Ego depletion is probably due to a neural rather than a metabolic phenomenon—Ego-depleted participants who received only a mouth rinse with glucose performed on par with participants who actually ingested glucose (Hagger & Chatzisarantis, 2013). Relatedly, Kool, McGuire, Wang, and Botvinick (2013) present neural evidence for the existence of ego depletion: they found that the dorsolateral prefrontal cortex, mentioned above in the review of Hayashi et al. (2013) as a region associated with the knowledge of a temptation's availability, also activates when a person exercises attentional filtering and when that person calculates the cognitive cost of making a decision. They take the fact that cognitive cost is calculated within the same region that exercises it as evidence that a limited resource—and its absence—exists and exercises a real effect on the nature of self-control.

Coping with stress, regulating negative affect, and resisting temptations require self-control. When the faculty of self-control is used for a prolonged period of time, subsequent efforts of self-control are less effective. Continual efforts, such as vigilance, also degrade over time (Muraven & Baumeister, 2000). Individual functions of self-control, such as making choices, inhibits the effectiveness of self-control in general in subsequent trials (Vohs et al., 2008). Wagner, Altman, Boswell, Kelley, and Heatherton (2013) demonstrate that, while top-down control is inhibited after self-regulatory exhaustion, neuronal rewards are actually strengthened, thus increasing the temptation of impulses. Thus, under the effect of ego depletion, self-control mechanisms become less effective and temptations increase in strength simultaneously, limiting even further the effectiveness of subsequent attempts at self-control during ego depletion.

Two common confounds encountered in the study of ego depletion are motivation and fatigue—it is difficult to control for the amount of motivation a participant experiences and hence the amount of self-control he or she begins with, and it is also difficult to control for how tired a participant is at the beginning of an experiment. A relatively small number of researchers posit that ego depletion is itself only apparent, merely an observation effect of one or both of these confounds. For example, according to the "process model," participants who appear to experience ego depletion are in fact attempting to make an optimal trade-off between task engagement and task disengagement; the act of self-control by a participant in an experiment is perceived by that participant to be useless, and the participant therefore begins to prioritize cognitive disengagement more highly (Carter, Kofler, Forster, & McCullough, 2015; Carter & McCullough, 2014; De Petrillo et al., 2015; Inzlicht et al., 2013). Ego depletion likely indeed involves a form of fatigue, especially in neuronal circuits involved in the ego depleting tasks (Hagger et al., 2010). However, fatigue in itself does not entirely explain ego depletion—Vohs, Glass, Maddox, and Markman (2011) found that sleep deprived participants were not statistically more likely to exhibit aggression, while ego-depleted participants were.

Researchers have noted that some cognitive techniques can be employed to attenuate the effects of ego depletion. For example, positive affect serves to improve self-regulation following ego depletion (Tice et al., 2007). The effect of glucose on ego depletion is affected by the beliefs of the participant regarding will-power (Job et al., 2013), indicating that even the effect of physiological interventions are modulated by participant attitudes. More will be said about these effects below.

Regarding the current study, it is likely that ego-depletion will factor into participants' experience of cyclical patterns in self-control. Further, if a participant suffers a perceived failure in self-control while in a state of ego-depletion, such as following a difficult academic task, then he or she may experience a concomitant increase in guilt and shame. That said, ego-depletion may not directly relate to any of the quantitative measures used in this study. It is presented here in order to better illustrate the current scholarly understanding of self-control and to provide a framework for understanding participant responses to the qualitative portion of the study.

Sleep. A common metaphor used to describe ego-depletion is that of a muscle, which becomes fatigued with overuse, requiring rest before it can be used again. Sleep deprivation among workers decreases self-control while increasing hostility, thus increasing deviance, including oppositional attitude and lowered efficacy (Christian & Ellis, 2011). Participants high in trait self-control showed decrements in the capacity for emotional work when under sleep deprivation, while participants low in trait self-control performed the same on the task regardless of their amount of sleep (Diestel et al., 2014). It has also been shown that self-control may serve as the mediator between sleep deprivation and delinquency (Meldrum, Barnes, & Hay, 2013). It is notable that while general fatigue helps explain some elements of ego depletion, ego depletion can still occur in the absence of general fatigue—Vohs et al. (2011) found that participants in both fatigued and non-fatigued groups exhibited average ego depletion at similar rates.

It remains a question whether a fourth factor could be added to Hofmann, Friese, and Strack's (2009) self-control model, perhaps most closely related to their construct of impulsive precursors but also influencing the other factors: participants who are in better

physical condition overall, such as through better restorative practices, are most likely to perform more optimally on self-control tasks due to greater efficiency of each component system. The phenomenon of self-control varies according to the participant's impulsive and reflective precursors and the dispositional boundary conditions of the task, but it depends on the amount of rest the person has received as well. That is, rest and sleep practices may serve as a convenient measure for the overall health of all components of the self-control apparatus.

Benefits of Self-Control

Well-being and life satisfaction. Self-control correlates with decreased motivational conflicts, thus occurring with decreased emotional distress and increasing positive affect (Hofmann et al., 2014). Self-control has also been correlated with good adjustment, less pathology, better grades, and interpersonal success (Tangney et al., 2004). Self-control has also been positively correlated with mindfulness (Bowlin & Baer, 2012). A longitudinal study also found that childhood self-control predicted improved later health, income, and public safety (Moffitt et al., 2011).

De Ridder, Lensvelt-Mulders, Finkenauer, Stok, and Baumeister (2012), using a meta-analysis of 102 studies, found that self-control correlated with the performance of desired behaviors most strongly when the behaviors were coded as "automatic" as opposed to "controlled." That is, self-control had more of an effect when applied to a behavior over time as opposed to a singular event, such as making one large, conscious decision. Galla and Duckworth (2015) similarly found that "good habits" mediate the relationship between self-control and positive life outcomes. They emphasize two important facts: First, self-control is most effective when directed assiduously toward

behaviors such that those behaviors become habit (i.e., automatic, as predicted by de Ridder et al. [2012]). Second, high trait self-control is best increased through the development of such positive habits. High trait self-control is necessary but not sufficient for acquiring the benefits often associated with it.

In addition to its direct relation to well-being, self-control has been shown to mediate much of the positive effects of mindfulness as well, which is itself further correlated with subjective well-being (Teper, Segal, & Inzlicht, 2013). Yusainy and Lawrence (2014), for example, found that increases in self-control explains much (though not all) of the effect of mindfulness on attenuating both aggression toward others and self-harm. Shin, Black, Shonkoff, Riggs, and Pentz (2016) similarly determined that dispositional mindfulness and executive function were positively correlated in an early adolescent population, along with positive behavioral correlates. Teper et al. (2013) propose a mechanism by which mindfulness might increase self-control: Mindfulness training expands the subject's awareness of environmental cues, including the presence of temptations and the subject's emotional state, which may help cue the subject to the need for increased self-regulation. The concomitant increase in self-control, per this model, would affect the bulk of the benefits of mindfulness. Note, however, that this is unlikely to be a one-way effect; one could hypothesize, for example, that self-control is requisite for one to practice mindfulness techniques assiduously enough to benefit from them, hinting that the relationship between self-control and mindfulness is likely considerably complex. Indeed, in some applications, it is conceivable that dispositional mindfulness and self-control are two dimensions of a single construct.

Religiosity, like mindfulness, has also been correlated with both higher self-control and better well-being; though religiosity and self-control have both been shown to be separate constructs, McCullough and Willoughby (2009) demonstrate that higher religiosity may provide higher self-control or higher motivation for self-control. Religiosity has long been known correlate with lower substance use; self-control has been shown to be a mediator of this relationship (DeWall et al., 2014). Interestingly, personal prayer has in one instance been shown to improve self-control and shorten the amount of time of ego depletion (Friese & Wänke, 2014). Although the mechanism of this effect was not elucidated by the study, one might hypothesize that the effect of personal prayer on self-control was mediated by increased positive affect, as demonstrated by Tice et al. (2007), as well as helping cue the individual into his or her guilt and shame.

Grit is the ability to direct effort toward a superordinate goal despite setbacks (Duckworth & Gross, 2014). I discuss grit here because it and self-control are highly correlated. While both of these constructs involve prioritizing goals and aligning actions with intention, self-control emphasizes the maintenance of a goal despite co-occurring, equally desirable goals, and grit involves working toward a single overarching goal through hardship and potentially over the course of years, a process that requires sacrificing short term goals that are in conflict with the long term goal (Duckworth & Gross, 2014). It is possible that grit, like dispositional mindfulness, is a process that overlaps with or is parallel to self-control in some contexts. However, as the skills required to build self-control are reminiscent of those required for grit, one might hypothesize that learning to improve self-control would also serve to improve grit (Wolters & Hussain, 2015). Like self-control, grit has likewise been correlated with a

number of other desirable constructs associated with well-being (Duckworth, Peterson, Matthews, & Kelly, 2007).

Interestingly, trait self-control varies according to gender in adolescence, with females scoring higher than males on measures of self-control. For example, Duckworth et al., (2015) found that higher self-control—and not motivation—explains the female advantage in report card grades. It is unclear based on this research what element of self-control is related to this inequity, such as, for example, whether boys have higher sensitivity to temptation or develop the capacity for attentional filtering at a slower pace compared to girls. Studying adolescent populations specifically may better inform biological models of self-control (Wolters & Hussain, 2015).

Detriments of Low Self-Control

Psychological distress. Just as high self-control is most often correlated with benefits, so low self-control is most often correlated with detriments. For example, impulsive consumer behaviors have been correlated with psychological distress (Rosenberg, 2004). Even viewing consumer items cued participants with low self-control to decrease social involvement and to experience increased negative affect **(**Bauer et al., 2012)—exposure to consumer items can be likened to exposure to a temptation in the context of self-control. Miller, Yu, Chen, and Brody (2015) found that even the benefits of self-control depend on some demographic factors; while low SES youth with high self-control also received all of the benefits of that self-control, it was at the expense of faster epigenetic aging, suggesting that more extensive exposure to a high-risk environment produces more physiological strain when self-control is high.

Tangney et al. (2004) found that high trait self-control is surprisingly inversely correlated with a number of mental disorders that are often regarded as disorders of excessive self-control, including obsessive-compulsive disorder (OCD), obsessive-compulsive personality disorder (OCPD), and disordered eating. It is important to note that Tangney at al. define self-control as the ability to inhibit unwanted impulses—OCD and OCPD, for example, each include compulsive tendencies that the actor has trouble controlling. Tangney et al.'s model of self-control also includes an emotional component, where those high in self-control are able to inhibit undesired affective states. Eating disorders, though they necessitate a high level of self-control in suppressing hunger in order to meet an internalized ideal, are nonetheless driven by unpleasant affective states that the person has trouble regulating (Lopez, Milyavskaya, Hofmann, & Heatherton, 2016). It is this difficulty with inhibiting unwanted internal states that was associated with low trait self-control in Tangney et al.'s study.

Antisocial behaviors. Low self-control is correlated with a higher incidence of domestic violence and more extreme domestic violence (Finkenauer et al., 2015; Watkins et al., 2013). Low self-control also predicts more serious antisocial behaviors in adolescence, including drug use, aggressive tendencies, theft, and truancy (Cauffman, et al., 2005). Regarding drug use specifically, high self-control has been shown to be implicated in increased success in reducing drug addiction, with those low in self-control less likely to initiate treatment and more susceptible to relapse once treatment is initiated (Tang, Posner, Rothbart, & Volkow, 2015). Kim, Namkoong, Ku, and Kim (2008) found that low self-control is associated with video game addiction as well—they found that the same low-self-control subjects were also more prone to violence, which they supplied as

support for the hypothesis that violent video games may increase aggression among those who play them, though it is also plausible, in reference to the research reviewed above, that those low in self-control are simply prone to all forms of addiction and to aggression. Whether the consumption of violence video games acts as a moderator between self-control and aggression is a subject for future inquiry.

Victimization and poverty. Low self-control has been implicated in people cyclically finding themselves in dangerous circumstances, such as survivors of domestic abuse experiencing repeated victimization (Turanovic & Pratt, 2012). Pratt et al. (2014) found that low self-control was a "modest yet consistent" predictor of victimization. Poverty has been shown to relate to low self-control, and Bernheim et al. (2015) propose a mechanism for this effect: the participant recognizes that there is no course of action that will avoid depleting available resources and therefore follows the easiest course of action. Complementary to this study, two cohort studies of self-control found that high childhood self-control mitigated unemployment later in life (Daly, Delaney, Egan, & Baumeister, 2015). Hence, a second mechanism is here proposed that the relationship between self-control and poverty is cyclical, with low self-control predicting unemployment and thus lower income, and poverty predicting lower motivation for self-control. Finally, related to the concept of learned helplessness, a person in poverty might also simply cease attempting to exercise self-control after experiencing multiple failures and frustrations.

Adolescence again serves as an interesting context in the study of self-control: Casey and Caudle (2013) and Casey (2015) discuss the increase in adolescent mortality from the perspective of a decrease in self-control using a biological model. Neuronal

changes in adolescence result in slower development of the prefrontal cortex and less ability of the prefrontal cortex to control emotional responses, including impulsivity and aggression. Adolescents can therefore be likened on some level to a general population low in self-control: Risk behaviors increase, and deaths related to events such as automobile accidents and use of weapons increase concomitantly.

Improving Self-Control

Techniques for increasing momentary self-control include changing physical circumstances, changing the mental representation of the situation, and resorting to direct suppression of impulses. Strategies employed early in the process of impulse generation and regulation are generally more effective than those employed later (Duckworth et al., 2014; Piquero et al., 2016). Self-control reciprocally influences other executive functions, leading to an impressive array of individual skills that must be honed in order to improve self-control. Inzlicht et al. (2014) identify among these the selection of an appropriate goal from which to exclude other impulses, the detection of conflicts, emotional acceptance in goal monitoring, the effects of fatigue, shifting priorities, and intention on the implementation of behavioral changes. Altering any of these components of self-control can affect the entire process, and different individuals seem to favor different processes to different extents. It is notable that Inzlicht et al. observe a sample without having differentiated high and low self-control individuals, leaving the question open whether high trait self-control individuals are more likely to favor specific techniques to a degree beyond that of the general population.

Just as personal prayer improves self-control (Friese & Wänke, 2014), third-person self-talk similarly increases self-control (Moser et al., 2017). The authors theorize

that self-talk assists participants in becoming aware of a broader range of features of the environment and their internal state, thereby increasing the overall access to information and helping them to avoid "losing sight" of the long-term goal. Similarly to techniques involving self-talk, Milyavskaya, Inzlicht, Hope, and Koestner, (2015) assert that "want-to" motivation serves to improve self-control by reducing the power of temptation rather than by increasing self-control itself. "Want-to" motivation consists of the participant reminding him or herself of the desired long-term goal in the presence of short-term temptations. As self-control is the process by which one desire is selected above mutually exclusive competing desires, increasing the power of the desired goal decreases the strength of antagonistic temptations proportionally; "want-to" motivation strengthens the prioritized desire, which concomitantly increases that desire's strength over competing temptations. It is likely that those high in trait self-control will use some technique to improve the power of the long-term goal over mutually exclusive, short-term temptations.

Friese et al. (2012) found that the application of mindfulness reduces the duration of ego depletion. To explain this effect, they describe mindfulness as serving to reduce cognitive resources devoted to "useless" applications, such as worry about unchangeable circumstances. Cognitive energy that is no longer applied to pointless tasks is then available for solving the self-control problems at hand. Mindfulness training has also been shown to improve self-control more generally, which then serves as a moderator to improve other measures of wellbeing (Bowlin & Baer, 2012). Finally, Leary, Adams, and Tate (2006) propose a form of mindfulness training to prolong the effects of self-control without ego-depletion by which participants learn to de-emphasize "egoic" (conscious and self-willed) motivations for self-control in favor of "non-egoic" states, such as flow

and attention to present sensory stimuli. They assert that this is another mechanism by which people can eliminate extraneous "mental noise" and therefore apply greater resources to more important cognitive tasks. In support of this theory, Uziel and Baumeister (2017) found those who desire greater self-control paradoxically perform worse on tasks that require self-control. They attribute this to the desire for self-control taking cognitive resources from the function of self-control itself. This serves as a reminder that self-control, parallel to executive function in general, requires a relatively large amount of cognitive resources, meaning that self-control will be sensitive to factors that decrease those resources, such as fatigue, or increase them, such as the practice of mindfulness through limiting mental "white noise."

Patrick, Chun, and MacInnis (2009) found that the motivation of pride for overcoming the temptation is a more effective motivator for successful self-control than is the threat of shame for failing at the task. They note, however, that participants sensitive to pride are also likely sensitive to negative self-referential emotions, and it is unclear based on this study how these emotions interact to affect self-control outside of the laboratory. Findings from positive psychology similarly link positive affect to improved self-control—Tice et al. (2007) found that positive affect decreases the duration and effect of ego-depletion. Furthermore, Cognitive Behavioral Therapy applies positive cognitions, such as reframes, to the treatment of a broad range of psychological concerns, some implicitly through the mechanism of improved self-control (Beck, 2011). Giner-Sorolla (2001) also found that participants are more likely to succeed on self-control tasks when primed to have a positive attitude toward the task. Conversely, participants primed for a negative attitude toward the task ("It's pretty hard, but just do the best you

can") were more likely to fail. This study provides more evidence for the necessity of positive affect toward the self-control task; it seems that participants who feel that the task is difficult or hopeless are more likely to abandon the task and conserve the considerable cognitive resources required. One might thus expect those high in self-control to be effective in applying emotional coping skills in the face of stressful stimuli.

It is notable that some researchers have found that self-control cannot be improved at all even through repeated practice—Participants who attended a 6-week training program for improving self-control were no better than controls on avoiding ego-depletion, overcoming unwanted habits, or using more self-control in everyday life (Miles et al., 2016). Piquero et al. (2016), in a meta-analysis study, asserted that while there are positive results to be made with implementing self-control training techniques, some of the effects cited in the literature are likely due to publication bias. Thus, while it appears that moderate gains can be made in self-control using the improvement techniques referenced above, it is unclear if and how self-control can be improved dramatically. A study aimed at investigating how people intuitively exercise self-control may shed light on the techniques most useful for more powerful self-control, leaving only the question of whether such techniques can be learned or are innate.

Negative Aspects of Self-Control

While the research into the benefits of self-control is well developed, research into the negative effects of high self-control is relatively less developed and more theoretical in nature. Two promising leads are presented here. First, Koole et al., (2014) posit that those high in self-control may be more prone to a state called "ego-fixation," in which they are unable to re-access inhibited responses to stimuli even after a self-control

task has ended. This process applied to multiple circumstances over the course of time leads to emotional alienation, where individuals are no longer aware of their true desires. Koole et al. assert that this state can be measured through the related construct of action control theory, which models individual motivational and affective regulation styles. This theory dichotomizes state-oriented and action-oriented styles. Action-oriented individuals tend to prefer decisive action toward a given task and are afterwards capable of disengaging. State-oriented individuals, on the other hand, tend to act hesitantly and afterward tend to remain preoccupied with the task, reflecting on performance and outcomes. Koole et al. equate state-orientation with ego-fixation, as state-orientation predisposes a person to chronic episodes of ego-fixation. As ego-fixation is defined task-specifically, there is no other measure of trait ego fixation directly. However, by measuring a person's action control, one may obtain a measure of susceptibility to ego fixation. While this line of research predicts that self-control will in general correlate with state-orientation, the writer is unaware of research in which this theory has been tested.

The concept of overcontrolled individuals has received attention in the research, though the construct as commonly defined does not relate per se to self-control as defined in this study. In personality theory, overcontrolled personalities are characterized by stormy temperaments and introversion, constructs associated with lower affective control (Donnellan & Robins, 2010). Emotional inhibition and social avoidance in particular are associated with personality symptomatology, especially avoidant, dependent, and paranoid types, as well as with dysthymia. This effect was mediated by interpersonal problems and perfectionism, indicating that some forms of control are correlated with pathology. Overcontrol is further associated with reduced spontaneity, social withdrawal,

and lack of assertiveness (Dimaggio et al., 2018). If these behaviors are regarded as responses to fears, it is possible to conceptualize such tendencies as resulting from difficulty regulating aversive affective states. Indeed, treatments for these personality disorders are modeled on treatments for anxiety in addition to interpersonal difficulties (Dimaggio & Overholser, 2019). The current study regards the classic construct of overcontrol as resulting from difficulties regulating anxiety (Tangney et al., 2008); excessive self-control is here considered related more to trouble accessing inhibited responses, including social involvement, than avoidance due to fear (Koole et al., 2012; Kuhl & Beckmann, 1994).

Inzlicht and Legault (2014) assert that self-control hinges on dissonance between a desired long-term goal and mutually exclusive, short-term temptations. They hypothesize that this form of psychological distress is most closely related to two negative self-conscious emotions, shame and guilt. That is, just as a person exercising self-control anticipates an experience of pride for overcoming temptations and achieving a prioritized goal, so he or she experiences shame as well when considering indulging in a proscribed temptation. While Inzlicht and Legault's study considers this effect at a theoretical level, the writer is not aware of any research that has adequately investigated how guilt and shame interact with self-control at the trait level. Tangney et al. (2004) included a measure of shame and guilt in their battery of measures, but the measure used (TOSCA) fails to discern between the subjective experiences of guilt and shame and behavioral responses to them, thus leaving the question of whether the internal experience of shame or guilt is indeed stronger for those high in self-control. That is, it

remains to be seen whether those high in trait self-control are similarly high in sensitivity to negative self-referential emotions.

This literature review reflects some of the most critical elements of self-control that have been studied thus far. In general, there is a consensus that periods of increased self-control are followed by a latency period during which the application of self-control is inhibited, though the mechanisms leading to such ego-depletion are poorly elucidated and contentious. Further, it appears that high trait self-control is in general a positive asset that predicts several factors related to improved general wellbeing and that self-control can be improved through various means. However, research into undesirable correlates of self-control is less developed, and little has been written regarding the extent to which self-control should be cultivated. This dissertation will correlate action and state orientation and shame and guilt sensitivity with self-control in a college sample to determine if there is in fact any such correlational relationship, indicating that there are undesirable effects of exercising self-control in some contexts. I hypothesize that self-control will be a unique predictor of (1) state-orientation, thus predisposing the subject to ego-fixation, and (2) sensitivity to self-referential negative emotions, both above and beyond self-deception and impression management. Further, (3) qualitative participant responses will be analyzed to determine their intuitive understanding of negative effects of self-control—I posit that interviewees will have an intuitive understanding of the uses and pitfalls of self-control that will inform future lines of research.

III. Method

Design

This study utilized a mixed methods design, more specifically an *equal status design*, where both qualitative and quantitative components received equal weight in the analysis (Johnson, Onwuegbuzie, & Turner, 2007). Survey data from phase 1 of the study were analyzed using Pearson product-moment correlation coefficients, hierarchical linear regression, and, curvilinear regression. The interview data were analyzed using grounded theory.

Participants

Participants were college undergraduates and graduate students at Auburn University. The mean age was 20.6 (SD = 2.37), with a range of 18-40. Most participants (n = 262; 85.3%) identified as White, 19 (6.2%) as Asian, 15 (4.9%) as Black, 6 (1.9%) as Hispanic, 4 (1.3%) as Native American, and 3 (0.9%) as of mixed race. Two hundred twenty participants (71.7%) identified as female, and 87 (28.3%) as male. Twelve participants were interviewed, with a mean age of 20.8. The interview participants all self-selected to participate in phase II. Nine of the interviewed participants were White, two were Black, and one was Pacific Islander. Ten were female, and two were male.

Measures

Demographics. At the beginning of the survey, participants were asked to report gender, age, and race/ethnicity. These data were collected, first, to help determine to what extent the conclusions of the study would be generalizable and, second, to help link survey data with interviews for those who participated in the second phase of the study.

Self-control. The Brief Self-Control Scale (SCS) (Tangney et al., 2004) was used to measure the participant's trait self-control. The SCS consists of thirty-six items on a Likert scale from 1 to 5, where 1 indicates "not at all" and 5 indicates "very much." Thirteen items from the full scale can be used alone to constitute the brief measure of the same construct. Maloney, Grawitch, and Barber (2012) note that comparatively little research has been applied to the development of measures of self-control and that the Self-Control Scale is the most reliable instrument currently in use. However, though the original authors contend that the scale is unidimensional, Maloney et al. found using exploratory factor analysis that the brief scale actually breaks into two factors, one that measures tendency toward impulsiveness and another that measures restraint. The authors present this as evidence for the measure's discriminant validity. In addition, the Brief Self-Control Scale still correlates significantly with other commonly used measures of self-control (Tangney et al., 2004). Cronbach's alpha for the Self-Control Scale was found by Tangney et al. to be .89 for the full scale and between .83 and .85 for the brief scale for their utilized sample, all indicating high reliability. Test-retest reliability was found to be .89 for the full scale and .87 for the brief scale.

Action control. The Action Control Scale (ACS-90) (Kuhl & Fuhrmann, 1998) is a 36 item scale consisting of mutually exclusive dyads. For each item, participants have the option of selecting either A or B, one of which is indicative of action orientation and the other of which is indicative of state orientation. The ACS-90 consists of three subscales: The Action Orientation Subsequent to Failure vs. Preoccupation (AOF), the Prospective and Decision-Related Action Orientation vs. Hesitation (AOD), and the Action Orientation During (Successful) Performance of Activities (Intrinsic Orientation)

vs. Volatility (AOP). Each subscale is meant to be used individually, and the authors do not provide a means of calculating a total score. Each scale consists of 12 items that describe a particular situation. The resulting scores of the subscales are summed to obtain the Global State and Action Orientation scores. Finally, the difference between these scores is calculated to obtain the strength of the orientation toward either action or state orientation. In this study, items were scored with reference to state orientation. Using this method, scores range from 0-12, with higher scores indicative of a greater predisposition for state-orientation. Diefendorff, Hall, Lord, and Strean (2000) found that the ACS-90 indeed adheres to the three factors as predicted by its subscales using exploratory factor analysis, implying discriminant validity. They further conclude that the ACS-90 does not significantly overlap with a wide variety of measures related to self-regulation, including personality and cognitive ability and present this as evidence for the measure's concurrent validity. Kuhl and Beckmann (1994) report good internal consistency (Cronbach's alpha = .81) and acceptable test-retest reliability (.78) for their utilized sample. Responses from the ACS-90 were correlated with responses from the SCS and used to answer Research Question 1.

Guilt and shame proneness. The Guilt and Shame Proneness Scale (Cohen et al., 2011) consists of 16 items on a 7-point Likert scale, where 1 is "Very Unlikely" and 7 is "Very Likely." This measure was selected due to its open distribution, its ability to measure the two constructs at the trait level, and its ability to differentiate between behavioral demonstrations of both shame and guilt and a person's internal experience of each. The scale includes four subscales, all of which are supported by exploratory factor analysis. The authors note that the scale is not meant to produce a total score, and

researchers are urged to use each subscale individually (Cohen et al., 2011). The authors note that measures utilizing vignettes often have lower internal consistencies compared to other self-report measures and therefore use a Cronbach's α of 0.6 as their cutoff. Internal consistency for the subscales ranged from 0.62 (Guilt-Repair) to 0.71 (Guilt-Negative Behavioral Evaluation) in their sample. The authors note that these are similar to or better than the internal consistency ratings for the Test of Self-Conscious Affect. All of the subscales with the exception of Shame-Withdrawal were significantly correlated with other measures of self-conscious affect and a variety of traits frequently correlated with self-conscious affect (religiosity, conventional morality, etc.), indicating that the scale can likely be used as a valid measure of the targeted constructs. Responses from the GASP were correlated with responses from the SCS and used to answer Research Question 2.

Desirable responding. Participants completed the Balanced Inventory of Desirable Responding (BIDR; Paulhus, 1988; 1991) as a validity check and as a statistical control. This scale consists of two 20-item subscales, one of which measures the participants tendency to make exaggerated claims of competence, and the other of which measures the participant's tendency to answer questions in a socially desirable fashion. The scale has participants respond on a 7-point Likert scale. Cronbach's α for the sample was .83, a high degree of internal consistency. The test-retest correlations over a 5-week period were .69 and .65 for the Self-Deception subscale and the Impression Management subscale, respectively (Paulhus, 1988; 1991). The sum of all BIDR items demonstrated an acceptable concurrent validity with other common measures used to

detect socially desirable responding in a college sample: .71 with the Marlowe-Crowne scale and .80 with the Multidimensional Social Desirability Inventory.

It is notable that Tangney et al. (2004) found that desirable responding was correlated with self-control (.60 with the BIDR); they managed this by repeating the results and partialing out social desirability. Paulhus, however, proposes as an alternate strategy of removing all scores from participants who score two standard deviations above the mean for the population in question on either subscale; he provides means for each gender in a college population for a study in which the threat of public disclosure has been adequately controlled. For Self-Deception, the cutoff is 13.9 for males and 13.0 for females. For impression management, the cutoffs are 10.5 for males and 13.0 for females (Paulhus, 1991). These gender-based cutoff scores were used to determine valid responses in the current study.

Procedure

Phase 1. The first sample was undergraduate and graduate students recruited through the SONA extra-credit program, a departmental program where students are awarded extra-credit for participating in research. An a priori power analysis was conducted using the correlations between the Self-Control Scale and the TOSCA in the previous work of Tangney et al. (2004), who obtained an effect size of .6. It was found that 70 participants would be needed to yield sufficient statistical power for a correlational study with a minimum power of .8 and the alpha set to .05. In the first stage of the study, participants completed the four self-report measures and supplied demographic information, including age, race, and gender. After examining bivariate correlations, hierarchical regression was used to examine whether self-control predicted

each outcome in a linear and curvilinear fashion, controlling for self-deception and impression management.

The BIDR was used to screen for bias toward desirable responses; data from those who scored above 13.9 on the Self-Deception subscale or 11.3 on the Impression Management subscale were discarded from further analysis. Scores from the two subtests of the BIDR were further used as a control in the hierarchical regression analyses. By participating in the first phase of the study, all participants received one SONA credit. Recruited participants were directed to an online survey. They completed the consent form and then filled out their demographic information. Following this, they took the self-report measures in random order in order to control for order effects. Participants were recruited until the data collection phase ended, from Summer 2018 to Spring 2019. Once participants completed the survey, they were provided with a randomly generated code number to link survey results with qualitative interviews without taking identifiable information. This procedure provided research participants with anonymity. As previous research has suggested that high self-control is associated overwhelmingly with desirable personality characteristics, this measure helped to ensure that data associated with socially undesirable responses was not individually identified. Data analysis of the quantitative data consisted of linear and then curvilinear regression, as applicable. All procedures were approved by the Auburn University Internal Review Board.

Phase 2. At the end of the survey, participants were oriented to the second phase of the study and invited to contact the Principal Investigator to schedule an interview. All participants were invited to participate in Phase II of the study, and all participants were interviewed who volunteered to do so during the timeframe for data collection. After the

interviews were scheduled, participants were asked to call a number provided by the Principal Investigator to initiate the interview. This was done to avoid taking any identifiable information from the research participants. Participants in the second phase received an additional SONA credit. All interviews followed the general questions as listed in Appendix E. Participants were notified that all identifiable information would be removed from the data before analysis was begun. The interviews were transcribed by the writer, and the transcripts were analyzed using grounded theory. Grounded theory is a form of qualitative analysis which focuses on developing models inductively. That is, researchers do not approach qualitative data with preconceived hypotheses, but rather allow hypotheses to develop throughout analysis. This provides research participants with more agency, as their individual perspectives have a greater influence over the trajectory of the study. Furthermore, grounded theory allows researchers to approach data from a broader perspective. As material is analyzed, patterns are marked with codes, which are subsequently arranged into concepts, and then, finally, into wider categories (Larkin, Watts, & Clifton, 2006; Reid, Flowers, & Larkin, 2005). First, interviews were transcribed. The researcher and a graduate student in Special Education, Rehabilitation, and Counseling then analyzed the transcripts separately and noted common trends, marking them with codes. Upon further analysis, these general patterns are arranged into broader and broader patterns. These were compiled with examples in the analysis and discussion of the data. The readers then used a compiled list of themes to code the transcripts, again separately. Throughout the analysis, the readers worked to suspend preconceptions regarding the participants and their experience. Furthermore, they

maintained an idiographic perspective on individual responses even when looking for overarching themes (Smith, 1996; Brocki & Wearden, 2006).

Data Analysis

Data analysis consisted of two phases. First, the five self-report measures were compared using hierarchical regression, with linear and curvilinear steps. Second, the interviews were coded using grounded theory, with two analysts first coding the interviews separately. The analysts were the Principal Investigator and a master's-level student recruited through a department research lab. Once both analysts had coded all transcripts, they discussed the prominent themes noticed by each, developing a comprehensive list of themes. Following this, using this comprehensive system, they coded the full set of transcripts a second time with both sets of themes in mind (Brocki & Wearden, 2006; Smith, 1996). Qualitative analysis ended when both readers agreed that the developed model encompassed the information provided in the interviews.

IV. Results

Demographic Variables

309 participants completed the survey portion of the study, and two of these responses (one male who scored 10 on the Self-Deception (SD) subscale and one female who scored 11 on Impression Management (IM) subscale) were excluded from analysis after their Balanced Inventory of Desirable Responding (BIDR) scores exceeded the cutoff, resulting in a sample of 307. Paulhus (1988) obtained average SD scores of 7.5 for males and 6.8 for females and average IM scores of 4.3 for males and 4.9 for females, while the current sample averaged 3.1 and 4.3 on SD and 1.8 and 1.5 on IM for males and females, respectively, resulting in lower cutoffs.

Descriptive Data

Table 1

*Mean Subscale Scores and Standard Deviations for Study Sample (*N = *307)*

Measure	*M*	*SD*
Self-control	40.6	8.1
Action orientation subsequent to failure	5.25	2.8
Preoccupation subsequent to failure	6.8	2.7
Decision-related action orientation	5.78	2.9
Decision-related hesitation	6.22	2.9
Action orientation during	8.38	2.4

performance of activities		
Volatility during Performance of Activities	3.6	2.4
Negative behavioral evaluation	5.39	1.25
Guilt-repair	5.43	1.10
Negative self-evaluation	5.57	1.13
Shame-withdrawal	3.11	1.03
Self-Deception	3.70	2.07
Impression Management	1.79	1.98

Tangney et al. (2004) obtained mean brief self-control scores of 39.22 and 39.85 for two undergraduate samples, with SDs of 8.58 and 8.61, respectively. In the current study, it is state-orientation that is being related to self-control. However, because Kuhl and Beckmann (1994) provided norms for action-orientation, those statistics are provided along with those for state-orientation in the table above. In a college sample, Kuhl and Beckmann obtained mean action orientation subsequent to failure scores of 5.11; prospective and decision-related action orientation, 5.92; and action orientation during performance of activities, 7.81. In two undergraduate samples, Cohen et al. (2011) obtained mean negative behavioral evaluation scores of 5.10 and 5.55 (SD 1.23 and 1.18); guilt-repair scores of 5.50 and 5.66 (SD 0.96 and 0.95); negative self-evaluation

scores of 5.47 and 5.62 (SD 1.03 and 1.06); and shame-withdrawal scores of 2.28 and 3.03 (SD 1.05 and 1.18). None of the means obtained in this study differed greatly from those of the before mentioned studies. Cronbach's α for the Self-Control Scale was found to be .83; for the Action Control Scale, .81; Negative-Behavioral Evaluation, .79; Guilt-Response, .78; Negative Self-Evaluation, .79; Shame-Withdrawal, .61; Self-Deception, .74; and Impression Management, .81.

Main Analyses

Quantitative analyses. Hierarchical linear and curvilinear regression was conducted for each state orientation subscale and each guilt and shame proneness subscale individually as the dependent variable, each with self-control as the independent variable and impression management and self-deception as controls. The curvilinear regression model was found to account for significantly more variance compared to the linear model in fitting the relationship between self-control and volatility during performance of activities.

Table 2

Pearson Correlation Coefficients among Scales

	1	2	3	4	5	6	7	8	9	10
1. Self-control	--									
2. Preoccupation subsequent to failure[a]	-0.16*	--								
3. Decision-related hesitation[a]	-0.50**	0.31**	--							
4. Volatility during performance of activities[a]	-0.30**	-0.11	0.26**	--						
5. Negative behavioral evaluation[b]	0.30**	0.04	-0.17*	-0.31**	--					
6. Guilt-repair[b]	0.25**	0.03	-0.17*	-0.36**	0.58**	--				
7. Negative self-evaluation[b]	0.15*	0.22**	-0.01	-0.29**	0.64**	0.58**	--			
8. Shame-withdrawal[b]	-0.20**	0.19**	0.16*	0.19*	0.02	-0.14*	0.05	--		
9. Self-deception[c]	0.18*	-0.12*	-0.17*	-0.08	0.03	0.14*	-0.02	-0.23**	--	
10. Impression management[c]	0.44**	-0.07	-0.26**	-0.24**	0.38**	0.25**	0.21**	-0.14*	0.47**	--

* $p < .05$. ** $p < .001$.

[a]Subcale of the Action Control Scale. [b]Subscale of the Guilt and Shame Proneness Scale

There were numerous significant bivariate correlations between measures, with self-control correlating significantly with all other measures. Notably, the two social desirability measures, self-deception and impression management, correlated highly with self-control. Because of this, it was necessary to control for social desirability in the regression analysis.

Table 3

*Hierarchical Regression Analysis Statistics for Each Subscale with SCS as Independent Variable and Controlled for Impression Management and Self-Deception (*N = *307)*

	Decision-Related Hesitation	Preoccupation Subsequent to Failure	Volatility during Performance of Activities	Guilt-Negative Behavioral Evaluation	Guilt-Repair	Negative Self-Evaluation	Shame-Withdrawal
Step 1							
Self-Deception	-0.06	-0.11	0.04	-0.18*	0.03	-0.15*	-0.25**
Impression Management	-0.24**	-0.02	-0.26**	0.44**	0.24**	0.27**	-0.07
R^2	.07	.01	.06	0.17	.06	.07	.08
F	11.75**	2.15	9.16**	30.07**	10.00**	10.49**	12.82**
Step 2							
Self-Deception	-0.08	-0.12	0.03	-0.18*	0.03	-0.15*	-0.24**
Impression Management	-0.01	0.06	-0.14*	0.36**	0.16*	0.24**	0.00
Self-Control	-0.48**	-0.16*	-0.25**	0.17*	0.17*	0.06	-0.17*
R^2	.26	.04	.11	.19	.08	.07	.10
ΔR^2	.19	.02	.05	.02	.02	.00	.02

ΔF	76.80**	6.72*	16.22**	8.78*	7.40*	1.07	7.37*
Step 3							
Self-Deception	-0.08	-0.12*	0.05	-0.18*	0.02	-0.16*	-0.24**
Impression Management	-0.01	0.06	-0.12	0.36**	0.16*	0.23*	0.01
Self-Control	-0.48**	-0.16*	-0.26**	0.17*	0.17*	0.07	-0.17*
Self-Control, squared	-0.09	-0.00	-0.13*	0.02	0.4	0.05	-0.03
R^2	.26	.04	.12	.19	.09	.07	.10
ΔR^2	.00	.00	.02	.00	.00	.00	.00
ΔF	0.01	0.00	5.20*	0.13	0.61	0.59	0.26

Note: Self-Deception, Impression Management, and Self-Control were centered at their means. Self-control was centered before being squared for the quadratic equation.

* $p < .05$. ** $p < .001$.

Regarding the action control scales, self-control negatively predicted decision-related hesitation and preoccupation subsequent to failure. While the linear analyses with these dependent variables accounted for significantly more variance compared to the controls alone, the quadratic regressions accounted for no more variance. On the other hand, the quadratic regression analysis with volatility during performance of activities as the dependent variable accounted for significantly more variance than the model with controls and linear self-control. This relationship can be described as a U-shaped curve, with volatility during performance of activities increasing as a function of self-control until the top of the curve and then decreasing as a function of self-control. The vertex of

this curve occurred at a self-control score of 41.68, 1.08 greater than the mean. Given these results, the research hypothesis for question 1, whether higher self-control would positively predict state-orientation, was rejected. While self-control correlates positively with volatility during performance of activities below self-control scores of 41.68, above this score self-control correlates negatively with the same construct. In addition, for the other two constructs related to action control, self-control was a negative linear predictor of state-orientation.

None of the quadratic regression models for the self-referential emotions accounted for significantly more variance compared to their corresponding linear models, but negative behavioral evaluation and guilt-related repair tendencies were both positively predicted by self-control, with the linear models accounting for significantly more variance compared to the models including the controls alone. The linear model for negative self-evaluation accounted for no more variance than the models with controls alone. Finally, withdrawal behaviors related to shame were negatively predicted by self-control, and the linear model accounted for more variance than the controls alone. Hence, part of the research hypothesis for question 2, whether self-control would correlate positively with the tendency to experience shame and guilt, was only partially rejected given these results. While constructs related to the experience of guilt were in fact predicted by self-control, constructs related to shame were either not significantly predicted by self-control once socially desirable reporting was factored out (as with negative self-evaluation) or were in fact predicted not to occur as a function of self-control (as with withdrawal behaviors related to shame).

Qualitative analysis. Twelve participants were interviewed who self-selected for participation in the qualitative portion of the study, with a mean age of 20.8 and a mean self-control score of 43.6; preoccupation subsequent to failure, 5; hesitation, 4; volatility during performance of activities 11; negative behavioral evaluation, 6.5; guilt-repair, 6.75; negative self-evaluation, 7; and shame-withdrawal, 4. Self-control was somewhat higher than that of the total sample, but not significantly so. Preoccupation subsequent to failure and decision-related hesitation were somewhat lower, but not significantly so. Volatility during performance of activities was significantly higher compared to the whole sample. Negative behavioral evaluation and shame-withdrawal were somewhat but not significantly higher than the total sample, while guilt-repair and negative self-evaluation were both significantly higher. Ten of the twelve interviewed participants identified as female, and two identified as male. Ten participants identified as White, one identified as Black, and one identified as Asian. All of the interviewed participants were able to provide an intuitive description of their experience of self-control. Interviews were transcribed, and two readers independently listed predominant themes using grounded theory. After the readers analyzed the transcripts and agreed on overarching themes, a combined set of themes was developed, and each reader coded the transcripts for these themes separately. Codes fell into these classes: identification of goal for exercising self-control, identification of means of maintaining self-control, negative effects of self-control, identification of temptation to self-control, experience of self-control failure, situations in which self-control was less important, and cyclical patterns in the exercise of self-control. Sub-codes were developed to identify the most common

specific themes within these larger classes, such as academic achievement as the long-term goal.

Table 4

Identified Categories and Codes for Interview Transcripts

Category	Code
Purpose of self-control	To organize tasks
	To suppress emotions
Application of self-control	For academics
	For maintaining body weight
Negative effects of self-control	Social isolation
	Self-alienation
Techniques for maintaining self-control	Reminding self of goal
	Reminding self of negative consequences of failure
Description of temptations	Socializing
	Substance use
Times when self-control is less important	While on vacation
	When with friends or family
Cyclical patterns in self-control	Dependent on point in semester
	Dependent on amount of work

Purpose and application of self-control. The code termed "purpose of self-control" was used to mark general observations on why humans possessed the capacity

for self-control, while "application of self-control" was used to indicate a participant's reported specific, concrete goal. However, participants tended to address both ideas in the same answer, providing a blanket statement about their view on self-control and then using a personal goal to exemplify it. Almost all participants described self-control as a means of completing important long-term tasks and provided academic achievement as personal goals. Many participants described admittance to graduate school as an important subcomponent of this goal, as expressed by one participant so:

> For me the biggest thing to stay on track, to do what you're supposed to do, is [to think of] grad school. I apply this summer. That's definitely what is keeping me motivated on wanting good grades and doing all the stuff like shadowing and all that.

Other common themes were self-control as a means of inhibiting socially undesirable reactions to others' behavior, with moderating anger often used as a personal example, and using self-control to "stay healthy" and to manage one's weight. Of these, managing one's weight was mentioned only by female participants, while controlling one's emotions was mentioned somewhat more frequently and by more participants. One participant described his negative emotional reaction to a break-up and how he used self-control to manage it:

> I had a four-year-long relationship that ended, and obviously like whenever it ended—She broke up with me—I wanted to lash out in anger and sadness and all this stuff, but obviously that would affect who I was around, it would affect what I was currently doing in school and work, so it took a lot out of me to not lash out in those feelings… Obviously I did get mad, and I was sad, but I didn't get it to a point where I was going out and yelling at people or screaming at people and it getting worse.

Negative effects of self-control. Five of the participants explicitly described negative effects of self-control, while three others described social isolation due to self-control without explicitly describing it as a negative effect. Of the first five, two

described social isolation or missing out on social engagements as the negative effects, while the other three described feeling "stressed" or "out of touch" with him or herself as the negative effect. All of these participants nonetheless described self-control as essential in at least some circumstances. One participant described her ambivalent relationship with self-control so: "I guess it causes problems of me like shutting other people out or just going and being alone, like separating myself from everybody else because that's the only way I know to control it." Another stated, "…[I]t's just harder to have friends, socialize."

While social isolation was often discussed explicitly, self-alienation was expressed in more diffuse terms, with participants having apparent difficulty finding adequate language. One participant described the experience as feeling "shut down" after an especially difficult application of self-control. Participants tended to describe self-alienation as occurring after strenuous academic tasks, such as final exams. One participant stated, "After I work really a lot, I'm not even sure what I want to do with myself anymore." Given that the experience of self-alienation was described as occurring after a difficult task, it may be tied to the phenomenon of ego-depletion. Self-alienation was described by one participant as occurring during the application of self-control; the participant stated (regarding writing a final paper), "I get so caught up in it that I can't, like, remember what I like to do. Like, fun things, or things that should be fun, just aren't there anymore."

Techniques for maintaining self-control. Nine of the twelve described focus on their ultimate goal as their primary means of maintaining self-control, and seven of the twelve also described removing themselves from temptation as a secondary means. Four

participants reported using a detailed schedule to help maintain self-control. Regarding possibly related reinforcement mechanisms, ten of the twelve described feelings of guilt or shame when they were unable to maintain self-control, and two cast blame on others or their context for their inability to maintain self-control in a given circumstance. One participant described dealing with temptation by both "switching off" and distracting himself from cravings and reminding himself that his need to work was only for a finite amount of time:

> …[W]hen the urges come, I just switch off. I just switch off, try to turn my energy, use my focus on other things, and, well, partly because I know it's just a temporary thing. It's been a couple of months, but, you know, it's not something that is permanent. That helps when, I guess, I just shift my focus to other important things, to work, music, whatever could serve as a distraction at the moment, if that helps.

It is notable that the participant's description of "switching off" may also relate to the phenomenon of self-alienation.

Ten interview participants described the process of self-control as a conversation with the self, with many providing examples of internal dialogue aimed at convincing the self to remain focused on the long-term goal. For example, one participant stated: "I have to tell myself what's most important sometimes. I really need to talk sense into myself." Of these, eight described lapses in self-control as "forgetting" their primary goals. Two participants, instead of using the model of "forgetting," described failures of self-control as disobedience to the self. Both of these participants were describing the phenomenon of being unable to control their facial expressions such that they did not offend an onlooker whom they were judging.

Description of temptations. As the primary application for self-control, presented spontaneously by ten of the interviewees, was dedication to school work at the

expense of participation in social activities, social activities were often described as the primary temptation ("… I just get FOMO [fear of missing out], I guess. I feel like I'm getting left out when my friends are hanging out, and I can't because I have like a test or quiz the next day"). Alcohol use was presented by two participants as enhancing this temptation ("I can't drink with friends or go to a game or whatever until I feel like I'm really ready [for a test]"). Six participants also described a desire to lose weight as a goal that required self-control, and of these, "sweets" were identified as their primary temptation. Perhaps because it was regarded as a taboo subject, sexual temptation was described by only one participant as a primary temptation to maintaining self-control.

Times when self-control is less important. As almost all participants noted that academic achievement was a primary goal, times when self-control was less important tended to correspond to breaks in their academic schedules. Eight participants stated that they were less likely to consciously employ self-control when on an academic holiday or during the weekend, as described by one participant so: "I guess like, I guess like Friday nights, game days, weekends, I have no self-control. I pretty much do what I want…"

That said, participants were aware that their college years were finite, and many maintained multiple competing priorities. One participant described how her academic priorities had become eclipsed by her desire to spend time with friends during her senior year:

> I feel like since it's like my senior year ... I feel like sometimes it's better to go hang out with friends, since I'm not going to see them probably after school. Or my best friend, he's going to leave in like the next few weeks, so I've been trying to hang out with him more. I think that's better than just sitting and studying all the time or like sometimes it's better, like if I'm exercising or something one day, sometimes it's better to not do as much as I usually do because I'm really tired and I need to sleep because I didn't sleep the night before.

Notably, many participants described self-control as contingent upon social contexts in addition to temporal periods of work and rest. Seven participants described self-control as less important when around close friends and family. One participant expressed this phenomenon thus:

> If you're surrounded by people who are like family and stuff, I don't really think that I'm thinking about what I'm going to say next, what I'm going to do next. That's kind of like a safe area where whatever I do, whatever I say won't be judged wrong or taken wrong or all that, so, yeah, I think I'm not really self-conscious of holding back anything whenever I'm around my family.

Cyclical patterns of self-control. Cyclical patterns in self-control were often, though not exclusively, discussed while describing times when self-control was less important. In accord with the theory of ego-depletion, participants tended to describe their ability to maintain self-control as a function of how long it had been exercised. Eight participants described having greater self-control at the beginning of an academic semester and having a decreased capacity for self-control as the semester progressed. However, three participants stated that they felt that they had greater self-control when presented with a large volume of work at once. These same three participants reported that they noticed a precipitous drop in their self-control once this large volume of work was concluded:

> It kind of just depends on the week. If I have a really busy week, then I think self-control can be harder just because I know how much I have to do, and I guess that kind of deters me, and I have periods where I don't have a lot of homework or there's not a lot going on, I think it's easier to get my work done because I know that, once I've finished that assignment, I don't have another one that I have to finish after it, so I know I can relax after. But in periods where I have a ton of tests or something, it can be really hard to keep going. I think it's just harder because… if I go from one assignment to the next, one thing to the next, it just makes it harder because you're always thinking, and you're always working and doing stuff, and I think that that can be really taxing on a person after a long period of time. I just fall apart, and self-control goes out the window after a period of time like that.

V. Discussion

These data indicate that there is a significant relationship between self-control and both state orientation and negative self-referential emotions as measured by, respectively, the ACS and the GASP. Furthermore, these results complement participants' intuitive awareness of the negative effects of self-control as presented in qualitative interviews. That said, the relationship between self-control as described in interviews and each of the scales used is complex and, considering the relationship between self-control and negative self-referential emotions, depends on the particular subscale. Furthermore, qualitative responses provided an overview of how participants view their own perceptions of and experiences with self-control, often reinforcing dominant themes from the scientific narrative and at points introducing new perspectives for future research.

Action-Control Style

These results indicate that a person's capacity for self-control does not predict an action-control style characterized by rigidity between goal-directed activities. This tendency was significant for each subscale, with the largest effect for the tendency to hesitate in initiating difficult tasks, suggesting that participants with higher self-control are less likely to experience hesitation in initiating activities related to indecision. However, the tendency to exhibit volatility in maintaining successful tasks during performance actually increases as a function of self-control below an SCS score of around 41.68; this finding indicates that self-control actually does predict this form of state orientation below this threshold. However, above this threshold, state orientation decreases as a function of self-control. Given that this threshold is near the sample mean

self-control score (40.6), it appears that the effect reflected by the curve is most evident in those with somewhat lower self-control.

This study does not support the hypothesis that higher self-control in general predicts a tendency toward ego-fixation. In fact, self-control was a significant negative predictor of the state-orientation construct on each subscale, indeed identifying self-control as a potential protective factor against state-orientation. Hence, neither of Koole et al.'s (2014) hypotheses (that self-control would predict preoccupation with failures to the detriment of further action and that those higher in self-control would find it more difficult to initiate tasks) are supported by these results. The Action Control Scale (ACS) is a measure of whether a person tends toward action or state orientations; ego-fixation is a postulated sequela of having a tendency toward state-orientation. The results obtained here do not exclude the possibility, however, that there is a positive correlation between self-control and ego-fixation. For example, one can entertain the possibility that devoting a large amount of attention to one pursuit could cause one to remain fixated on the pursuit even after the activity has ended. However, if this relationship does exist, then this research shows that it is not likely detectable using the ACS alone—Researchers interested in this topic will likely need to develop a separate scale to measure ego-fixation or devise a method of measurement that relies upon observed behaviors. Furthermore, it is unclear why participants with self-control scores below 40.6 actually exhibit greater passivity as their SCS scores increase. This effect may be attributable, for example, to fewer available total cognitive resources among these participants decreasing their ability to initiate complicated tasks, but future research will need to investigate the phenomenon to gain a fuller understanding of the mechanisms at work.

Self-Control and Negative Self-Referential Emotions

Both dimensions of guilt as measured by the Guilt and Shame Proneness Scale were predicted by self-control. That is, the higher a person's self-control as measured using the Self-Control Scale, the more likely he or she is to evaluate his or her behaviors negatively and to experience a desire to correct their mistakes. On the other hand, he or she would be likely to have lower scores on the Shame-Withdraw subscale, indicating that the person is less likely to exhibit withdrawal behaviors related to shame. Cohen et al. (2011) present specifically social withdrawal and self-destructive behaviors, including especially substance use, as examples of shame-related behaviors detected by the GASP. This complements findings that those high in self-control are less likely to engage in such self-destructive behaviors, with substance use frequently correlated negatively with self-control. The model that predicted the measure of internal experience of shame, or negative self-evaluation, with self-control did not account for significantly more variance than the controls alone, suggesting that shame is neither positively nor negatively related to self-control after accounting for social desirability. This is in opposition to findings by Tangney et al. (2004), where self-control was found to correlate negatively with a propensity to experience shame.

As a person's self-control increases, they may exhibit an increased propensity for guilt, or the tendency to evaluate their behaviors negatively. Concurrently, they are more likely to attempt to repair their perceived mistakes. That said, they are not necessarily more likely to exhibit a greater propensity for shame, or to evaluate themselves more negatively. Further, they are less likely to exhibit self-destructive or socially isolating behaviors as a response to shame. Thus, though they experience guilt, they are less likely

to punish the self for mistakes, but rather more likely to repair perceived errors directly. It is notable that guilt is likely more psychologically adaptive than shame in regards to a perceived personal error, as guilt tends to lead to repair behaviors, while shame may increase negative self-referential cognitions and self-destructive behaviors without repair behaviors (Tangney et al., 2008). Thus, self-control may correlate with guilt and not shame because self-control facilitates more adaptive (and socially desirable) responses to perceived personal errors.

Either the inherited neurological architecture or learned behaviors that facilitate self-control may predispose one to sensitivity to guilt without increasing the likelihood of sensitivity to shame. One potential explanation for why this pattern prevails is that participants high in self-control may be more likely to idealize pro-social causes, a line of thought strengthened by the argument that self-control evolved to the complexity demonstrated in humans out of a need for individuals to sacrifice selfish impulses in order to coexist with minimal conflict (Baumeister & Juola Exline, 1999; MacLean et al., 2014). Hence, people with higher self-control may be more likely to seek to repair social mistakes, as reflected by the measure of Guilt-Repair, but less likely to exhibit shame behaviors because they perceive them as selfish. This is a hypothesis to be investigated by further study. Another possibility is that participants high in self-control are simply better able to avoid engaging in behaviors that they find destructive to the self, despite experiencing the impulse to do so.

It is notable that participants higher in self-control reported experiencing higher guilt responses, and yet correlated negatively to failure fixation as measured by the ACS. This apparent contradiction is resolved by the reminder that the ACS measures behavioral

reactions as opposed to internal affective experience—That is, it is still possible that those higher in self-control experience greater emotional pain when presented with failure, but are less likely to allow that pain to debilitate them to initiating further action. Indeed, Shame-withdrawal behaviors, such as social withdrawal and substance use, appear to be more impulsive in nature, and it is possible that people who have difficulty initiating behaviors to repair their missteps therefore rely on more expedient means of self-soothing.

Self-Control as Perceived by Research Participants

Regarding clinical applications of these findings, it is notable that the majority of the participants interviewed found that visualizing their goals, as well as the negative results that would likely ensue if they failed to maintain their self-control, was the most useful means of increasing self-control. Other techniques commonly employed in self-control training programs, such as producing priority lists (Duckworth et al., 2014; Inzlicht et al., 2014; Piquero et al., 2016), were mentioned with much less frequency. The most common scenario presented was choosing between studying and engaging in social activities, with graduation or admittance to graduate programs presented as the ultimate goal. In these cases, another prominent technique that participants employed was to remove themselves from the temptation, such as by avoiding social activities during exam periods.

Regarding how participants tended to remind themselves of their goals, it appeared that one technique employed consisted of the participant speaking to him or herself either internally or out loud. Self-talk has been investigated as a means of increasing self-control, with results indicating that it can be employed with success

(Moser et al., 2017). That said, a minority of participants described using self-talk as a means of facilitating self-control. In many cases, although participants were able to describe reminding themselves of their ultimate goals as their most used technique toward maintaining self-control, little was gleaned about what this process might look like for each individual using only their verbal descriptions; they very often themselves had a difficult time conceptualizing and verbalizing the process during interviews, perhaps due to the unconscious nature of these states. What temporal patterns and triggers are involved in reminding oneself of one's higher goal? How is the higher goal represented cognitively? These are questions to be pursued in future research; how these processes take place cognitively (or even neurologically) would help toward the development of training programs to facilitate self-control, a construct, though shown to be not without its negative correlates by the present study, nevertheless appears to be overall beneficial to those who exercise it at a high level.

Interviewed participants were able to provide a potential negative side effect of self-control that has not previously been addressed in scientific literature. In particular, participants felt that exercising self-control predisposed them to social isolation— Participants often presented it as a choice between completing their prioritized goals and, as one participant put it, "having friends." One participant who presented fidelity to his long-distance romantic partner as his primary goal described avoiding women as his primary means of maintaining control. These results hint that some degree of social isolation, a construct associated with numerous negative psychological correlates, is a side-effect of chronic application of self-control. Because this was not a construct included in the quantitative portion of this study, it is difficult to deduce if this is a

significant effect or if it speaks more to participants' perceptions. Either way, this could be a significant point of interest for future studies designed to explore this effect in greater depth. Furthermore, participants seemed to describe the experience of emotional alienation during interviews, indicating that ego-fixation is indeed a potential side effect of self-control. Further research will need to be done in order to determine whether it was not detected here through the quantitative measures because the measure used was inadequate for detecting it or because ego-fixation, though it does occur, does not occur at statistically significant levels as a side effect of self-control.

While most cited negative effect of self-control was missing out on social pursuits, another commonly cited complaint was experience of guilt when unable to meet goals. Participants who expressed blame most often described it as self-oriented; only two participants made reference to another entity for their own perceived faults in their ability to maintain self-control. These data reinforce this study's quantitative findings on the relationship between self-control and the internal affective experience of guilt. In addition, that participants were much more likely to blame themselves than others for their faults lends some credence to the theory that self-control is an evolutional development that correlates with prosocial viewpoints and behaviors (MacLean et al., 2014). This is yet another point worthy of consideration in future research.

The majority of participants expressed a belief in self-control as a limited resource, with most stating that self-control was easier to maintain at the beginning of an academic semester and harder to maintain when presented with a large amount of work at once. A minority considered self-control easiest to maintain when presented with a large volume of work, though this subset of participants also noted universally that they tended

to become more disinhibited once this work was completed. This suggests that the limited resource model of self-control is either true to the point that those who employ self-control are aware of its finite nature (important knowledge, considering the extent to which humans rely upon it) or that the theoretical construct has been promulgated to the extent that it has seeped into our zeitgeist's folk psychology. Still, of importance to clinical programs aimed at increasing clients' facility at maintaining self-control is the fact that, even if ego-depletion is attributable to placebo, clients nonetheless likely hold these beliefs. On the other hand, if ego-depletion is better attributable to a physical or physiological process, then it seems plausible that training programs will need to address the limited quantity of self-control by assisting, for example, as suggested by some participants during interviews, in pacing themselves as they apply self-control skills. The best way to address ego-depletion is yet another topic worthy of further scientific consideration, with potentially profound clinical applications. These considerations would be of interest to any training program aimed at improving participants' self-control skills.

Limitations

The generalizability of the current study was limited by the exclusive inclusion of college students from one institution; thus, this sample utilized consisted predominantly of middle class, White females between the ages of eighteen and twenty-two. Shame and guilt may have radically different manifestations depending on the culture of the person in question (Bierbrauer, 1992; Furukawa, Tangney, & Higashibara, 2012). Hence, it is possible that participant responses on the GASP may change when a wider breadth of

cultural groups is included in the study. The current study reflects most accurately only how a White, middle class, female sample experiences guilt, shame, and self-control.

The sample also demonstrated a tendency toward emphasizing scholastic achievement, and their perceived failures of self-control concomitantly most often reflected the selection of social endeavors over studying. Further, the sample, having obtained admission to a university, as such likely demonstrated higher overall self-control compared to the general population. It is also notable that only a small subset of the total sample participated in qualitative interviews, further limiting the generalizability of the qualitative data. That said, though the general perception of self-control and the techniques used to foster it were adequately demonstrated for the purposes of the present study, it would be of interest to future research to investigate more diverse applications of self-control and more diverse populations.

Further, it is notable that this study utilized self-report data exclusively. Although measures were taken to minimize the effect of a participant's desire to portray him or herself favorably on the study results, some artifact due to participant self-defense likely remains. In order to better understand the phenomena considered here, future investigations will benefit from the diversification of research methods to include, for example, behavioral observation in addition to self-report measures. Further, considering that the results of the present study are entirely correlational or otherwise dependent upon self-report, future studies may advance the understanding of the construct by establishing harder causative relationships among the treated constructs through, for example, experimental studies and longitudinal studies. Finally, because this is a cross-sectional study, one is unable to determine whether self-control truly predicts an action-orientation

and sensitivity to guilt or vice versa. Future studies on the theme will benefit from using a wider array of research approaches to better determine the causal structure of the involved constructs.

In conclusion, self-control, though regarded by participants as a valuable skill, was not without negative side effects. These side effects help to portray high self-control as a tendency that can be applied to excess, such that the person becomes potentially socially less connected and more susceptible to guilt. Furthermore, participants were aware of or believed that they could only maintain self-control for a finite period of time or for a finite number of applications and afterwards experienced greater behavioral disinhibition. Self-control is thus a necessary, inherently human quality that can nonetheless be exercised to excess, with some distress and potentially negative social and psychological outcomes resulting to the exerciser.

References

Bauer, M. A., Wilkie, J. E., Kim, J. K., & Bodenhausen, G. V. (2012). Cuing consumerism: Situational materialism undermines personal and social well-being. *Psychological Science*, *23*(5), 517-523.

Baumeister, R. F., & Juola Exline, J. (1999). Virtue, personality, and social relations: Self‐control as the moral muscle. *Journal of Personality*, *67*(6), 1165-1194.

Beck, J. S. (2011). Cognitive-behavioral therapy. *Clinical textbook of addictive disorders*, *491*, 474-501.

Beedie, C. J., & Lane, A. M. (2012). The role of glucose in self-control: Another look at the evidence and an alternative conceptualization. *Personality and Social Psychology Review*, *16*(2), 143-153.

Bernheim, B. D., Ray, D., & Yeltekin, Ş. (2015). Poverty and Self‐Control. *Econometrica*, *83*(5), 1877-1911.

Bierbrauer, G. (1992). Reactions to violation of normative standards: A cross-cultural analysis of shame and guilt. *International Journal of Psychology*, *27*(2), 181-193.

Bowlin, S. L., & Baer, R. A. (2012). Relationships between mindfulness, self-control, and psychological functioning. *Personality and Individual Differences*, *52*(3), 411-415.

Brocki J.J.M, Wearden A.J. (2006). "A critical evaluation of the use of interpretative phenomenological analysis (IPA) in health psychology". *Psychology and Health, 21*(1), 87-108.

Carter, E. C., Kofler, L. M., Forster, D. E., & McCullough, M. E. (2015). A series of meta-analytic tests of the depletion effect: self-control does not seem to rely on a

limited resource. *Journal of Experimental Psychology: General, 144*(4), 796.

Carter, E. C., & McCullough, M. E. (2014). Publication bias and the limited strength model of self-control: has the evidence for ego depletion been overestimated?. *Frontiers in Psychology*, *5*.

Casey, B. J. (2015). Beyond simple models of self-control to circuit-based accounts of adolescent behavior. *Annual Review of Psychology*, *66*, 295-319.

Casey, B. J., & Caudle, K. (2013). The teenage brain: Self control. *Current Directions in Psychological Science*, *22*(2), 82-87.

Cauffman, E., Steinberg, L., & Piquero, A. R. (2005). Psychological, neuropsychological and physiological correlates of serious antisocial behavior in adolescence: The role of self-control. *Criminology*, *43*(1), 133-176.

Christian, M. S., & Ellis, A. P. (2011). Examining the effects of sleep deprivation on workplace deviance: A self-regulatory perspective. *Academy of Management Journal*, *54*(5), 913-934.

Cohen, T. R., Wolf, S. T., Panter, A. T., & Insko, C. A. (2011). Introducing the GASP scale: a new measure of guilt and shame proneness. *Journal of Personality and Social Psychology*, *100*(5), 947.

Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology*, *24*(4), 349.

Daly, M., Delaney, L., Egan, M., & Baumeister, R. F. (2015). Childhood self-control and unemployment throughout the life span: Evidence from two British cohort studies. *Psychological Science*, *26*(6), 709-723.

De Petrillo, F., Micucci, A., Gori, E., Truppa, V., Ariely, D., & Addessi, E. (2015). Self-

control depletion in tufted capuchin monkeys (Sapajus spp.): does delay of gratification rely on a limited resource?. *Frontiers in Psychology*, *6*.

De Ridder, Lensvelt-Mulders, Finkenauer, Stok, and Baumeister (2012)

DeWall, C. N., Pond Jr, R. S., Carter, E. C., McCullough, M. E., Lambert, N. M., Fincham, F. D., & Nezlek, J. B. (2014). Explaining the relationship between religiousness and substance use: self-control matters. *Journal of Personality and Social Psychology*, *107*(2), 339.

Diamond, A. (2013). Executive functions. *Annual Review of Psychology*, *64*, 135-168.

Diefendorff, J. M., Hall, R. J., Lord, R. G., & Strean, M. L. (2000). Action–state orientation: Construct validity of a revised measure and its relationship to work-related variables. *Journal of Applied Psychology*, *85*(2), 250.

Diestel, S., Rivkin, W., & Schmidt, K. H. (2015). Sleep quality and self-control capacity as protective resources in the daily emotional labor process: Results from two diary studies. *Journal of Applied Psychology*, *100*(3), 809.

Dimaggio, G., MacBeth, A., Popolo, R., Salvatore, G., Perrini, F., Raouna, A., Su Osam, C., Buonocore, L., Bandiera, A., & Montano, A. (2018). The problem of overcontrol: Perfectionism, emotional inhibition, and personality disorders. *Comprehensive psychiatry*, *83*, 71-78.

Dimaggio, G., & Overholser, J. C. (2019). Treatment of Clients with Anxious and Over-controlled Personality Disorders: An International Accord. *Journal of Contemporary Psychotherapy*, *49*(1), 1-6.

Donnellan, M. B., & Robins, R. W. (2010). Resilient, overcontrolled, and undercontrolled personality types: Issues and controversies. *Social and*

Personality Psychology Compass, *4*(11), 1070-108

Duckworth, A. L., Gendler, T. S., & Gross, J. J. (2014). Self-control in school-age children. *Educational Psychologist*, *49*(3), 199-217.

Duckworth, A., & Gross, J. J. (2014). Self-control and grit: Related but separable determinants of success. *Current Directions in Psychological Science*, *23*(5), 319-325.

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: perseverance and passion for long-term goals. *Journal of personality and social psychology*, *92*(6), 1087.

Duckworth, A. L., Shulman, E. P., Mastronarde, A. J., Patrick, S. D., Zhang, J., & Druckman, J. (2015). Will not want: Self-control rather than motivation explains the female advantage in report card grades. *Learning and Individual Differences*, *39*, 13-23.

Duckworth, A. L., & Steinberg, L. (2015). Unpacking self‐control. *Child Development Perspectives*, *9*(1), 32-37.

Ent, M. R., Baumeister, R. F., & Tice, D. M. (2015). Trait self-control and the avoidance of temptation. *Personality and Individual Differences*, *74*, 12-15.

Finkenauer, C., Buyukcan-Tetik, A., Baumeister, R. F., Schoemaker, K., Bartels, M., & Vohs, K. D. (2015). Out of control: identifying the role of self-control strength in family violence. *Current Directions in Psychological Science*, *24*(4), 261-266.

Friese, M., Messner, C., & Schaffner, Y. (2012). Mindfulness meditation counteracts self-control depletion. *Consciousness and cognition*, *21*(2), 1016-1022.

Friese, M., & Wänke, M. (2014). Personal prayer buffers self-control depletion. *Journal*

of Experimental Social Psychology, *51*, 56-59.

Furukawa, E., Tangney, J., & Higashibara, F. (2012). Cross-cultural continuities and discontinuities in shame, guilt, and pride: A study of children residing in Japan, Korea and the USA. *Self and Identity*, *11*(1), 90-113.

Galla, B. M., & Duckworth, A. L. (2015). More than resisting temptation: Beneficial habits mediate the relationship between self-control and positive life outcomes. *Journal of Personality and Social Psychology*, *109*(3), 508.

Ghoniem, A., & Hofmann, W. (2016). A neglected spot in self-control-the influence of attitudes towards impulses on self-control. *European Health Psychologist*, *18*(S), 877.

Giner-Sorolla, R. (2001). Guilty pleasures and grim necessities: affective attitudes in dilemmas of self-control. *Journal of Personality and Social Psychology*, *80*(2), 206.

Gul, F., & Pesendorfer, W. (1999). Temptation and self‐control. *Econometrica*, *69*(6), 1403-1435.

Hagger, M. S., & Chatzisarantis, N. L. (2013). The sweet taste of success: The presence of glucose in the oral cavity moderates the depletion of self-control resources. *Personality and Social Psychology Bulletin*, *39*(1), 28-42.

Hagger, M. S., Wood, C., Stiff, C., & Chatzisarantis, N. L. (2010). Ego depletion and the strength model of self-control: a meta-analysis. *Psychological Bulletin*, *136*(4), 495.

Harris, A., Hare, T., & Rangel, A. (2013). Temporally dissociable mechanisms of self-control: early attentional filtering versus late value modulation. *Journal of*

Neuroscience, *33*(48), 18917-18931.

Hayashi, T., Ko, J. H., Strafella, A. P., & Dagher, A. (2013). Dorsolateral prefrontal and orbitofrontal cortex interactions during self-control of cigarette craving. *Proceedings of the National Academy of Sciences*, *110*(11), 4422-4427.

Hofmann, W., Friese, M., & Strack, F. (2009). Impulse and self-control from a dual-systems perspective. *Perspectives on Psychological Science*, *4*(2), 162-176.

Hofmann, W., Luhmann, M., Fisher, R. R., Vohs, K. D., & Baumeister, R. F. (2014). Yes, but are they happy? Effects of trait self‐control on affective well‐being and life satisfaction. *Journal of Personality*, *82*(4), 265-277.

Inzlicht, M., & Legault, L. (2014). No pain, no gain: How distress underlies effective self-control (and unites diverse social psychological phenomena). *The Control Within: Motivation and Its Regulation*, 115-132.

Inzlicht, M., Legault, L., & Teper, R. (2014). Exploring the mechanisms of self-control improvement. *Current Directions in Psychological Science*, *23*(4), 302-307.

Inzlicht, M., Schmeichel, B. J., & Macrae, C. N. (2013). Why self-control seems (but may not be) limited. *Trends in Cognitive Sciences*, *18*(3), 127-133.

Job, V., Walton, G. M., Bernecker, K., & Dweck, C. S. (2013). Beliefs about willpower determine the impact of glucose on self-control. *Proceedings of the National Academy of Sciences*, *110*(37), 14837-14842.

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, *1*(2), 112-133.

Jones, S., Lynam, D. R., & Piquero, A. R. (2011). Substance use, personality, and inhibitors: Testing Hirschi's predictions about the reconceptualization of self-

control. *Crime & Delinquency*, *61*(4), 538-558.

Kasser, T. E., & Kanner, A. D. (2004). *Psychology and consumer culture: The struggle for a good life in a materialistic world*. American Psychological Association.

Kim, E. J., Namkoong, K., Ku, T., & Kim, S. J. (2008). The relationship between online game addiction and aggression, self-control and narcissistic personality traits. *European Psychiatry*, *23*(3), 212-218.

Kool, W., McGuire, J. T., Wang, G. J., & Botvinick, M. M. (2013). Neural and behavioral evidence for an intrinsic cost of self-control. *PloS One*, *8*(8), e72626.

Koole, S. L., Tops, M., Strübin, S., Bouw, J., Schneider, I. K., & Jostmann, N. B. (2014). The ego fixation hypothesis: Involuntary persistence of self-control. *The control within: Motivation and its regulation*, 95-112.

Kuhl, J., & Beckmann, J. (1994). Volition and personality: Action versus state orientation. Seattle: Hogrefe & Huber.

Kuhl, J., & Fuhrmann, A. (1998). Decomposing self-regulation and self-control: The Volitional Components Inventory. In J. Heckhausen & C. S. Dweck (Eds.), *Motivation and self-regulation across the life span* (pp. 15-49). New York, NY, US: Cambridge University Press.

Larkin, M., Watts, S., Clifton, E. (2006). Giving voice and making sense in Interpretative Phenomenological Analysis. *Qualitative Research in Psychology*, *3:2*, 102-120.

Leary, M. R., Adams, C. E., & Tate, E. B. (2006). Hypo-egoic self-regulation: Exercising self-control by diminishing the influence of the self. *Journal of personality*, *74*(6), 1803-1832.

Lopez, R. B., Milyavskaya, M., Hofmann, W., & Heatherton, T. F. (2016). Motivational

and neural correlates of self-control of eating: a combined neuroimaging and experience sampling study in dieting female college students. *Appetite*, *103*, 192-199.

MacLean, E. L., Hare, B., Nunn, C. L., Addessi, E., Amici, F., Anderson, R. C., ... & Boogert, N. J. (2014). The evolution of self-control. *Proceedings of the National Academy of Sciences*, *111*(20), E2140-E2148.

Madden, G. J., & Bickel, W. K. (2010). *Impulsivity: The behavioral and neurological science of discounting*. American Psychological Association.

Maloney, P. W., Grawitch, M. J., & Barber, L. K. (2012). The multi-factor structure of the Brief Self-Control Scale: Discriminant validity of restraint and impulsivity. *Journal of Research in Personality*, *46*(1), 111-115.

Mauss, I. B., Levenson, R. W., McCarter, L., Wilhelm, F. H., & Gross, J. J. (2005). The tie that binds? Coherence among emotion experience, behavior, and physiology. *Emotion*, *5*(2), 175.

McCullough, M. E., & Willoughby, B. L. (2009). Religion, self-regulation, and self-control: Associations, explanations, and implications. *Psychological Bulletin*, *135*(1), 69.

Meldrum, R. C., Barnes, J. C., & Hay, C. (2013). Sleep deprivation, low self-control, and delinquency: A test of the strength model of self-control. *Journal of Youth and Adolescence*, *44*(2), 465-477.

Miles, E., Sheeran, P., Baird, H., Macdonald, I., Webb, T. L., & Harris, P. R. (2016). Does self-control improve with practice? Evidence from a six-week training program. *Journal of Experimental Psychology: General*, *145*(8), 1075.

Miller, G. E., Yu, T., Chen, E., & Brody, G. H. (2015). Self-control forecasts better psychosocial outcomes but faster epigenetic aging in low-SES youth. *Proceedings of the National Academy of Sciences*, *112*(33), 10325-10330.

Milyavskaya, M., Inzlicht, M., Hope, N., & Koestner, R. (2015). Saying "no" to temptation: Want-to motivation improves self-regulation by reducing temptation rather than by increasing self-control. *Journal of Personality and Social Psychology*, *109*(4), 677-693.

Mischel, W., Ebbesen, E. B., & Raskoff Zeiss, A. (1972). Cognitive and attentional mechanisms in delay of gratification. *Journal of personality and social psychology*, *21*(2), 204.

Mischel, W. (2014). *The marshmallow test: understanding self-control and how to master it*. Random House.

Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., ... & Sears, M. R. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences*, *108*(7), 2693-2698.

Molden, D. C., Hui, C. M., Scholer, A. A., Meier, B. P., Noreen, E. E., D'Agostino, P. R., & Martin, V. (2012). Motivational versus metabolic effects of carbohydrates on self-control. *Psychological science*, *23*(10), 1137-1144.

Moser, J. S., Dougherty, A., Mattson, W. I., Katz, B., Moran, T. P., Guevarra, D., ... & Kross, E. (2017). Third-person self-talk facilitates emotion regulation without engaging cognitive control: Converging evidence from ERP and fMRI. *Scientific Reports*, *7*.

Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle?. *Psychological Bulletin*, *126*(2), 247.

Patrick, V. M., Chun, H. E., & MacInnis, D. J. (2009). Affective forecasting and self-control: When anticipating pride wins over anticipating shame in a self-regulation context. *Journal of Consumer Psychology*, *19*(3), 537-545.

Paulhus, D. L. (1988). Balanced inventory of desirable responding (BIDR). *Acceptance and Commitment Therapy. Measures Package*, *41*.

Paulhus, D. L. (1991). Measurement and control of response bias. In J. P. Robinson, P. R. Shaver & L. S. Wrightsman (Eds.), *Measures of Personality and Social Psychological Attitudes* (pp. 17-59). San Diego, CA: Academic Press.

Piquero, A. R., Jennings, W. G., Farrington, D. P., Diamond, B., & Gonzalez, J. M. R. (2016). A meta-analysis update on the effectiveness of early self-control improvement programs to improve self-control and reduce delinquency. *Journal of Experimental Criminology*, *12*(2), 249-264.

Pratt, T. C., Turanovic, J. J., Fox, K. A., & Wright, K. A. (2014). Self‐control and victimization: A meta‐analysis. *Criminology*, *52*(1), 87-116.

Reid, K., Flowers, P. & Larkin, M. (2005) Exploring lived experience: An introduction to Interpretative Phenomenological Analysis. The Psychologist, 18:1, 20-23.

de Ridder, D. T., Lensvelt-Mulders, G., Finkenauer, C., Stok, F. M., & Baumeister, R. F. (2012). Taking stock of self-control: A meta-analysis of how trait self-control relates to a wide range of behaviors. *Personality and Social Psychology Review*, *16*(1), 76-99.

Rosenberg, E. L. (2004). Mindfulness and consumerism. *Psychology and Consumer Culture: The Struggle for a Good Life in a Materialistic World*, 107-125.

Shin, H. S., Black, D. S., Shonkoff, E. T., Riggs, N. R., & Pentz, M. A. (2016). Associations among dispositional mindfulness, self-compassion, and executive function proficiency in early adolescents. *Mindfulness*, *7*(6), 1377-1384.

Smith, J.A. (1996)"Beyond the divide between cognition and discourse: Using interpretative phenomenological analysis in health psychology". *Psychology & Health, 11*(2), 261-271.

Tang, Y. Y., Posner, M. I., Rothbart, M. K., & Volkow, N. D. (2015). Circuitry of self-control and its role in reducing addiction. *Trends in Cognitive Sciences*, *19*(8), 439-444.

Tangney, J. P. (1996). Conceptual and methodological issues in the assessment of shame and guilt. *Behaviour research and therapy*, *34*(9), 741-754.

Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self‐control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, *72*(2), 271-324.

Teper, R., Segal, Z. V., & Inzlicht, M. (2013). Inside the mindful mind: How mindfulness enhances emotion regulation through improvements in executive control. *Current Directions in Psychological Science*, *22*(6), 449-454.

Tice, D. M., Baumeister, R. F., Shmueli, D., & Muraven, M. (2007). Restoring the self: Positive affect helps improve self-regulation following ego depletion. *Journal of Experimental Social Psychology*, *43*(3), 379-384.

Turanovic, J. J., & Pratt, T. C. (2012). “Can’t stop, won’t stop”: Self-control, risky

lifestyles, and repeat victimization. *Journal of Quantitative Criminology*, *30*(1), 29-56.

Uziel, L., & Baumeister, R. F. (2017). The Self-Control Irony: Desire for Self-Control Limits Exertion of Self-Control in Demanding Settings. *Personality and Social Psychology Bulletin*, *43*(5), 693-705.

Vohs, K. D., Baumeister, R. F., Schmeichel, B. J., Twenge, J. M., Nelson, N. M., & Tice, D. M. (2008). Making choices impairs subsequent self-control: a limited-resource account of decision making, self-regulation, and active initiative. *Motivation Science*, *1*(S), 19-42.

Vohs, K. D., Glass, B. D., Maddox, W. T., & Markman, A. B. (2011). Ego depletion is not just fatigue: evidence from a total sleep deprivation experiment. *Social Psychological and Personality Science*, *2*(2), 166-173.

Wagner, D. D., Altman, M., Boswell, R. G., Kelley, W. M., & Heatherton, T. F. (2013). Self-regulatory depletion enhances neural responses to rewards and impairs top-down control. *Psychological Science*, *24*(11), 2262-2271.

Watkins, L. E., DiLillo, D., Hoffman, L., & Templin, J. (2013). Do self-control depletion and negative emotion contribute to intimate partner aggression? A lab-based study. *Psychology of Violence*, *5*(1), 35.

Watts, T. W., Duncan, G. J., & Quan, H. (2018). Revisiting the marshmallow test: A conceptual replication investigating links between early delay of gratification and later outcomes. *Psychological science*, *29*(7), 1159-1177.

Webb Hooper, M., & Carver, C. S. (2016). Reflexive reaction to feelings predicts failed smoking cessation better than does lack of general self-control. *Journal of*

Consulting and Clinical Psychology, *84*(7), 612.

Wittmann, M., Peter, J., Gutina, O., Otten, S., Kohls, N., & Meissner, K. (2014). Individual differences in self-attributed mindfulness levels are related to the experience of time and cognitive self-control. *Personality and Individual Differences*, *64*, 41-45.

Wolters, C. A., & Hussain, M. (2015). Investigating grit and its relations with college students' self-regulated learning and academic achievement. *Metacognition and Learning*, *10*(3), 293-311.

Yu, R. (2012). Regional white matter volumes correlate with delay discounting. *PloS one*, *7*(2), e32595.

Yusainy, C., & Lawrence, C. (2014). Relating mindfulness and self-control to harm to the self and to others. *Personality and Individual Differences*, *64*, 78-83.

Appendix A: Self-Control Scale (Tangney et al., 2004)

Using the scale provided, please indicate how much each of the following statements reflects how you typically are.

1. I am good at resisting temptation. * Not at all Very much
2. I have a hard time breaking bad habits. *(R) 1—2—3—4—5
3. I am lazy. *(R)
4. I say inappropriate things. *(R)
5. I never allow myself to lose control.
6. I do certain things that are bad for me, if they are fun. *(R)
7. People can count on me to keep on schedule.
8. Getting up in the morning is hard for me. (R)
9. I have trouble saying no. (R)
10. I change my mind fairly often. (R)
11. I blurt out whatever is on my mind. (R)
12. People would describe me as impulsive. (R)
13. I refuse things that are bad for me. *
14. I spend too much money. (R)
15. I keep everything neat.
16. I am self-indulgent at times. (R)
17. I wish I had more self-discipline. *(R)
18. I am reliable.
19. I get carried away by my feelings. (R)
20. I do many things on the spur of the moment. (R)
21. I don't keep secrets very well. (R)
22. People would say that I have iron self-discipline. *
23. I have worked or studied all night at the last minute. (R)
24. I'm not easily discouraged.
25. I'd be better off if I stopped to think before acting. (R)
26. I engage in healthy practices.
27. I eat healthy foods.
28. Pleasure and fun sometimes keep me from getting work done. *(R)
29. I have trouble concentrating. * (R)
30. I am able to work effectively toward long-term goals. *
31. Sometimes I can't stop myself from doing something, even if I know it is wrong. * (R)
32. I often act without thinking through all the alternatives. *(R)
33. I lose my temper too easily. (R)
34. I often interrupt people. (R)
35. I sometimes drink or use drugs to excess. (R)
36. I am always on time.

* Items included in the Brief Self Control measure
(R) Reversed Items

Appendix B: Action Control Scale (ACS-90) (Kuhl & Fuhrmann, 1998)

Choose the one of the possible answers (A or B) that is most like you and give an answer for every question on the supplied answer sheet. Please don't make any marks on this questionnaire.

1. When I have lost something valuable and can´t find it anywhere:
   ( ) A) I have a hard time concentrating on anything else.
   ( ) B) I don't dwell on it.

2. When I know I must finish something soon:
   ( ) A) I have to push myself to get started.
   ( ) B) I find it easy to get it done and over with.

3. When I have learned a new and interesting game:
   ( ) A) I quickly get tired of it and do something else.
   ( ) B) I can really get into it for a long time.

4. When I´ve worked for weeks on one project and then everything goes completely wrong:
   ( ) A) It takes me a long time to get over it.
   ( ) B) It bothers me for a while, but then I don´t think about it anymore.

5. When I don´t have anything in particular to do and I am getting bored:
   ( ) A) I have trouble getting up enough energy to do anything at all.
   ( ) B) I quickly find something to do.

6. When I'm working on something that's important to me:
   ( ) A) I still like to do other things in between working on it.
   ( ) B) I get into it so much th I can work on it for a long time.

7. When I´m in a competition and lose every time:
   ( ) A) I can soon put losing out of my mind.
   ( ) B) The thought that I lost keeps running through my mind.

8. When I am getting ready to tackle a difficult problem:
   ( ) A) It feels like I am facing a big mountain that I don´t think I can climb.
   ( ) B) I look for a way that the problem can be approached in a suitable manner.

9. When I'm watching a really good movie:
   ( ) A) I get so involved in the film that I don't even think of doing anything else.
   ( ) B) I often want to get something else to do while I'm watching the movie.

10. If I had just bought a new piece of equipment (for example, a laptop) and it accidentally fell on the floor and was damaged beyond repair:

   ( ) A) I would get over it quickly.
   ( ) B) It would take me a while to get over it.

11. When I have to solve a difficult problem:
   ( ) A) I usually get on it right away.
   ( ) B) I have trouble sorting out things in my head so that I can get down to working on the problem.

12. When I have been busy for a long time doing something interesting (for example, reading a book or working on a project):

   ( ) A) I sometimes think about whether what I'm doing is really worthwhile.
   ( ) B) I usually get so involved in what I'm doing that I never think to ask about whether it's worthwhile.

13. When I have to talk to someone about something important and, repeatedly, can´t find her/him at home:

   ( ) A) I can´t stop thinking about it, even while I´m doing something else.
   ( ) B) I easily forget about it until I can see the person again.

14. When I have to make up my mind about what I am going to do when I get some unexpected free time:

   ( ) A) It takes me a while to decide what I should do.
   ( ) B) I can usually decide on something to do without having to think it over very much.

15. When I read an article in the newspaper that interests me:
   ( ) A) I usually remain so interested in the article that I read the entire article.
   ( ) B) I still often skip to another article before I've finished the first one.

16. When I´ve bought a lot of stuff at a store and realize when I get home that I paid too much - but I can´t get my money back:

   ( ) A) I can´t concentrate on anything else.
   ( ) B) I easily forget about it.

17. When I have work to do at home:
   ( ) A) It is often hard for me to get started.
   ( ) B) I usually get started right away.

18. When I'm on vacation and I'm having a good time:
    ( ) A) After a while, I really feel like doing something completely different.
    ( ) B) I don't even think about doing anything else until the end of my vacation.

19. When I am told that my work has been completely unsatisfactory:
    ( ) A) I don´t let it bother me for too long.
    ( ) B) I feel paralyzed.

20. When I have a lot of important things to do:
    ( ) A) I often don´t know where to begin.
    ( ) B) I find it easy to make a plan and stick with it.

21. When one of my co-workers brings up an interesting topic for discussion:
    ( ) A) It can easily develop into a long conversation.
    ( ) B) I soon lose interest and want to go do something else.

22. When I´m stuck in traffic and miss an important appointment:
    ( ) A) At first, it´s difficult for me to start doing anything else at all.
    ( ) B) I quickly forget about it and focus on something else.

23. When there are two things that I really want to do, but I can´t do both of them:
    ( ) A) I quickly begin one thing and forget about the other.
    ( ) B) It´s not easy for me to put the thing that I couldn´t do out of my mind.

24. When I am busy working on an interesting project:
    ( ) A) I need to take frequent breaks and work on other projects.
    ( ) B) I can keep working on the same project for a long time.

25. When something is very important to me, but I can´t seem to get it right:
    ( ) A) I gradually lose heart.
    ( ) B) I just forget about it and go do something else.

26. When I have to carry out an important but unpleasant task:
    ( ) A) I do it and get it over with.
    ( ) B) It can take a while before I can bring myself to do it.

27. When I am having an interesting conversation with someone at a party:
    ( ) A) I can talk to him or her the entire evening.
    ( ) B) I prefer to go do something else after a while.

28. When something really gets me down:
    ( ) A) I have trouble doing anything at all.
    ( ) B) I find it easy to distract myself by doing other things.

29. When I am facing a big project that has to be done:
    ( ) A) I often spend too long thinking about where I should begin.

( ) B) I don´t have any problems getting started.

30. When it turns out that I am much better at a game than the other players:
( ) A) I usually feel like doing something else.
( ) B) I really like to keep playing.

31. When several things go wrong on the same day:
( ) A) I don't know how to deal with it.
( ) B) I just keep on going as though nothing had happened.

32. When I have a boring assignment:
( ) A) I usually don´t have any problem getting through it.
( ) B) I sometimes just can´t get moving on it.

33. When I read something I find interesting:
( ) A) I sometimes still want to put the article down and do something else.
( ) B) I will sit and read the article for a long time.

34. When I have put all my effort into doing a really good job on something and the whole thing doesn´t work out:

( ) A) I don´t have too much difficulty starting something else.
( ) B) I have trouble doing anything else at all.

35. When I have an obligation to do something that is boring and uninteresting:
( ) A) I do it and get it over with.
( ) B) It usually takes a while before I get around to doing it.

36. When I am trying to learn something new that I want to learn:
( ) A) I'll keep at it for a long time.
( ) B) I often feel like I need to take a break and go do something else for a while.

Appendix C: The Guilt and Shame Proneness Scale (GASP) (Cohen, Wolf, Panter, & Insko, 2011)

Participants respond on a 7-point Likert scale from 1 (very unlikely) to 7 (very likely).

Instructions: In this questionnaire you will read about situations that people are likely to encounter in day-to-day life, followed by common reactions to those situations. As you read each scenario, try to imagine yourself in that situation. Then indicate the likelihood that you would react in the way described.

_____ 1. After realizing you have received too much change at a store, you decide to keep it because the salesclerk doesn't notice. What is the likelihood that you would feel uncomfortable about keeping the money?

_____ 2. You are privately informed that you are the only one in your group that did not make the honor society because you skipped too many days of school. What is the likelihood that this would lead you to become more responsible about attending school?

_____ 3. You rip an article out of a journal in the library and take it with you. Your teacher discovers what you did and tells the librarian and your entire class. What is the likelihood that this would make you would feel like a bad person?

_____ 4. After making a big mistake on an important project at work in which people were depending on you, your boss criticizes you in front of your coworkers. What is the likelihood that you would feign sickness and leave work?

_____ 5. You reveal a friend's secret, though your friend never finds out. What is the likelihood that your failure to keep the secret would lead you to exert extra effort to keep secrets in the future?

_____ 6. You give a bad presentation at work. Afterwards your boss tells your coworkers it was your fault that your company lost the contract. What is the likelihood that you would feel incompetent?

_____ 7. A friend tells you that you boast a great deal. What is the likelihood that you would stop spending time with that friend?

_____ 8. Your home is very messy and unexpected guests knock on your door and invite themselves in. What is the likelihood that you would avoid the guests until they leave?

_____ 9. You secretly commit a felony. What is the likelihood that you would feel remorse about breaking the law?

_____ 10. You successfully exaggerate your damages in a lawsuit. Months later, your lies are discovered and you are charged with perjury. What is the likelihood that you would think you are a despicable human being?

_____ 11. You strongly defend a point of view in a discussion, and though nobody was aware of it, you realize that you were wrong. What is the likelihood that this would make you think more carefully before you speak?

_____ 12. You take office supplies home for personal use and are caught by your boss. What is the likelihood that this would lead you to quit your job?

_____ 13. You make a mistake at work and find out a coworker is blamed for the error. Later, your coworker confronts you about your mistake. What is the likelihood that you would feel like a coward?

_____ 14. At a coworker's housewarming party, you spill red wine on their new cream- colored carpet. You cover the stain with a chair so that nobody notices your mess. What is the likelihood that you would feel that the way you acted was pathetic?

_____ 15. While discussing a heated subject with friends, you suddenly realize you are shouting though nobody seems to notice. What is the likelihood that you would try to act more considerately toward your friends?

_____ 16. You lie to people but they never find out about it. What is the likelihood that you would feel terrible about the lies you told?

GASP SCORING: The GASP is scored by averaging the four items in each subscale.

Guilt-Negative-Behavior-Evaluation (NBE): 1, 9, 14, 16

Guilt-Repair: 2, 5, 11, 15

Shame-Negative-Self-Evaluation (NSE): 3, 6, 10, 13

Shame-Withdraw: 4, 7, 8, 12

Appendix D: The Balanced Inventory of Desirable Responding (Paulhus, 1988)

Participants respond to a 7-point Likert scale from 1 (not true) to 7 (very true). Items marked with an asterisk are reverse coded.

1. My first impressions of people usually turn out to be right.
*2. It would be hard for me to break any of my bad habits.
3. I don't care to know what other people really think of me.
*4. I have not always been honest with myself.
5. I always know why I like things.
*6. When my emotions are aroused, it biases my thinking.
7. Once I've made up my mind, other people can seldom change my opinion.
*8. I am not a safe driver when I exceed the speed limit.
9. I am fully in control of my own fate.
*10. It's hard for me to shut off a disturbing thought.
11. I never regret my decisions.
*12. I sometimes lose out on things because I can't make up my mind soon enough.
13. The reason I vote is because my vote can make a difference.
*14. My parents were not always fair when they punished me.
15. I am a completely rational person.
*16. I rarely appreciate criticism.
17. I am very confident of my judgments.
*18. I have sometimes doubted my ability as a lover.
19. It's all right with me if some people happen to dislike me.
*20. I don't always know the reasons why I do the things I do.
*21. I sometimes tell lies if I have to.
22. I never cover up my mistakes.
*23. There have been occasions when I have taken advantage of someone.
24. I never swear.
*25. I sometimes try to get even rather than forgive and forget.
26. I always obey laws, even if I'm unlikely to get caught.
*27. I have said something bad about a friend behind his or her back.
28. When I hear people talking privately, I avoid listening.
*29. I have received too much change from a salesperson without telling him or her.
30. I always declare everything at customs.
*31. When I was young I sometimes stole things.
32. I have never dropped litter on the street.
*33. I sometimes drive faster than the speed limit.
34. I never read sexy books or magazines.
*35. I have done things that I don't tell other people about.
36. I never take things that don't belong to me.
*37. I have taken sick-leave from work or school even though I wasn't really sick.
38. I have never damaged a library book or store merchandise without reporting it.
*39. I have some pretty awful habits.
40. I don't gossip about other people's business.

Appendix E: Qualitative Interview Questions

1. (A) In what ways is self-control important for you? (B) How is self-control evident in your life?
2. (A) Tell me about something you've done recently that required a lot of self-control. Walk me through this experience. (B) What was your goal, and what did you have to do to meet it? (C) Is there anything you had to resist?
3. In that situation, what are some things you did or thought about to help you maintain self-control?
4. (A) Tell me about a long-term goal of yours that requires a lot of self-control. This can be an ongoing project or a recurring goal. (B) What do you have to do to meet this goal? (C) Is there anything you have to resist?
5. As you work toward this long-term goal, what are some things you do or think about to help you maintain self-control.
6. (A) Walk me through a time when you weren't able to exercise self-control like you wanted. (B) What are some things you did, thought about, or felt when you were not able to maintain self-control? (C) What kind of problems did it cause for you?
7. (A) Tell me about a recurring or ongoing situation in which it is especially difficult for you to maintain self-control. (B) What makes self-control difficult in this situation?
8. What are some times in your life when self-control is not important for you? Are there times when you exercise less restraint?

9. (A) What are patterns that you notice in your ability to maintain self-control? (B) Do you notice periods of time when you are less successful exercising self-control? (C) Why do you think this is?
10. As we wrap up, is there anything else you'd like to say or that you wish I'd asked about?

Appendix F: Codes Used in Analysis of Qualitative Interviews

Participant provides a purpose for self-control
- The point of self-control is to organize tasks (including scheduling)
- Self-control used to suppress emotions
- Other purpose of self-control

Participant expresses a specific goal of self-control
- Participant uses self-control for academics
- Participant uses self-control for maintaining body weight

Participant describes a negative effect of self-control
- Participant describes social isolation as a negative effect
- Participant describes another negative effect of self-control

Participant talk about how he or she maintains self-control
- Participant maintains self-control by reminding self of goal
- Participant maintains self-control by reminding self of negative consequences of failure
- Other technique used to maintain self-control

Participant describes a temptation
- Socializing as a foil to self-control
- Other foil to self-control

Participant describes instance when uses less self-control
- Less control used while on vacation
- Less control used while with friends and family
- Other answer to “less restraint” question

Participant describes cyclical pattern to self-control
- Self-control depends on point in semester
- Other response to patterns of self-control question

Appendix G: Informed Consent Form

Informed Consent Form

Auburn University supports the practice of protection of human participants in research. The following will provide you with information about the experiment that will help you in deciding whether or not you wish to participate. If you agree to participate, please be aware that you are free to withdraw at any point throughout the duration of the experiment without any penalty.

This study investigates how self-control relates to other desirable and undesirable personality traits. In this study we will ask you to answer questions about yourself. All information you provide will remain confidential. During this study, you may be asked to answer questions of a personal nature. Although you may not directly benefit from this study, you will be helping to expand our understanding of self-control. If for any reason during this study you do not feel comfortable, you may discontinue and receive credit for the time you participated and your information will be discarded. Your participation in this study will require approximately 30-45 minutes. When this study is complete you will be provided with the results of the study if you request them, and you will be free to ask any questions. If you have any further questions concerning this study please feel free to contact us through phone or email: Dean Hayes at doh0002@auburn.edu (931-581-6548) or Joseph Buckhalt at buckhja@auburn.edu (334-844-2860). Please indicate with your signature on the space below that you understand your rights and agree to participate in the experiment.

Your participation is solicited, yet strictly voluntary. All information will be kept confidential and your name will not be associated with any research findings.

_____ _____

Signature of Participant Dean O. Hayes, Investigator

_____

Print Name