Ya Gotta Wanna:
Shifting Motivational Priorities in the Self-Control Process

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“Ya Gotta Wanna: Shifting Motivational Priorities in the Self-Control Process”
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Title:
Ya Gotta Wanna: Shifting Motivational Priorities in the Self-Control Process

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Self-control has been linked to a range of important academic, social, and achievement-related outcomes (Tangney et al., 2004). However, there are a variety of differing perspectives on the process by which individuals exert self-control. Thus, the self-control process is still ambiguous and there is no single model that researchers have yet to agree upon. The purpose of this dissertation is to examine this self-control process in more detail, drawing from the shifting priorities self-control process model (Inzlicht, Schmeichel, & Macrae, 2014). More specifically, the study examined the distinct influence of regulatory-related constructs, specifically delay of gratification and future time perspective, on the motivational shifts that take place over time in the self-control process. In addition, motivational shifts during a self-control task were evaluated to determine relationships with important work-related outcomes. In particular, this study focused on the impact of self-control exertion on work ethic behavior (i.e., time spent exerting effort on a task) and associated task performance. These issues were investigated through a study involving a simulation program where participants were expected to work on an effortful task for an extended period of time, while being probed on their current goal priorities throughout task completion. The results provided empirical support for the shifting priorities proposition, suggesting that there are underlying within-person
motivational shifts that occur during the self-control exertion process. Specifically, the findings show that have-to motivation levels on-task significantly decreased over time, while want-to motivation levels off-task significantly increased over time. Although the regulatory traits were not significant individual predictors of motivation slopes, there was an interesting interaction effect, such that the combination of high future time perspective and high delay of gratification was associated with decreasing want-to off-task motivation levels during the self-control exertion period. Additionally, there was no support for the relationship between motivational slopes and time spent working on the task. However, results did show that spending more time on labor was related to better task performance. Overall, these results help to clarify ambiguous findings in this research area by identifying key motivational processes that can influence self-control failure following extended effort exertion. The present study may have several key implications for researchers looking for alternative non-resource dependent explanations for ego depletion effects.
# Table of Contents

Abstract .................................................................................................................................................. iii  
List of Figures ........................................................................................................................................ vi  
List of Tables ......................................................................................................................................... vii  
Acknowledgements................................................................................................................................ viii  
Introduction ........................................................................................................................................... 1  
Chapter 1 ............................................................................................................................................. 4  
Chapter 2 ............................................................................................................................................. 15  
Chapter 3 ............................................................................................................................................... 18  
Chapter 4 ............................................................................................................................................... 26  
Chapter 5 ............................................................................................................................................... 35  
Chapter 6 ............................................................................................................................................... 40  
Chapter 7 ............................................................................................................................................... 42  
Chapter 8 ............................................................................................................................................... 45  
Method ................................................................................................................................................... 53  
Results ..................................................................................................................................................... 61  
Discussion ............................................................................................................................................. 67  
Practical Implications ............................................................................................................................. 78  
Limitations and Future Research ........................................................................................................... 79  
Conclusion ............................................................................................................................................. 83  
References ............................................................................................................................................. 85  
Appendices ............................................................................................................................................ 117
List of Figures

Figure 1. Theoretical Model .................................................................44
Figure 2. Interaction Effect.................................................................132
List of Tables

Table 1: Demographic Frequencies.................................................................124
Table 2: Descriptive Statistics.................................................................126
Table 3: Correlations and Reliabilities.........................................................127
Table 4: Hierarchical Linear Model Results ...............................................128
Table 5: Linear Regression Results............................................................129
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“If I have seen further it is by standing on the shoulders of Giants” -- Isaac Newton, 1675

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Introduction

On a typical day, people attempt to exert self-control across numerous domains - with varying degrees of success. The exertion of self-control allows individuals to achieve their goals. Imagine an individual beginning her first music lesson with the intention of learning to play the piano. Throughout her musical journey, her skill and self-control help determine success in achieving her goal. She can be taught the necessary skills, but the skill is wasted if there is no discipline to develop it. Persisting towards her goal requires her to progress through tasks like participating in piano lessons, learning the music notes, and practicing the songs – all of which entail consistent exertion of self-control. As she pursues her goal, she finds sometimes she is driven to turn off the television and begin practicing the songs for her upcoming recital. However, at other times, she struggles to stay focused when reviewing the musical notes, so instead she chooses to watch a few episodes of her favorite show.

In the scenario described above, the psychological perspective is centered on self-regulation, which entails the processes used to decrease the gap between her initial piano-playing abilities and her desired level of musical fluency. Self-regulation reduces this gap through a series of motivational functions that guide goal-directed activities through modulation of attention, thought, affect, and behavior (Karoly, 1993). Within the context of self-regulation, a distinct construct referred to as self-control acts as a key antecedent necessary for goal striving and achievement (Conklin, 2013). Over the years, conceptual distinctions made by researchers between self-regulation and self-control have become muddled through interchangeable use of the different terms (Vohs & Baumeister, 2004; Nelson, de Haan, & Thomas, 2006). Conklin (2013) explained that self-regulation involves
both conscious and automatic processes; however, self-control involves either conscious or executive functions for managing behavior. Although self-regulation plays a very important role in goal pursuit and its processes have been studied extensively (Schunk, 2008), the literature lacks a unified explanation of how the construct of self-control operates in day-to-day activities. Researchers are still actively studying and debating the mechanism of self-control (Robinson, Schmeichel, & Inzlicht, 2010; de Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012), and recently the literature has demanded more empirical evaluation of its process (Inzlicht, Schmeichel, & Macrae, 2014; Kotabe & Hofmann, 2015). Some scholars have even stated that the self-control literature is currently undergoing a “conceptual crisis” and “replication crisis” (Arber, Ireland, Feger, Marrington, Tehan, & Tehan, 2017; Lurquin & Miyake, 2017).

Self-control, the construct and the way it functions, has immense implications at individual and societal levels. There have been several favorable outcomes linked to self-control, such as improved intellectual functioning (Schmeichel, Vohs & Baumeister, 2003), enhanced health behaviors (Crescioni et al., 2011; Wills, Isasi, Mendoza, & Ainette, 2007), more pleasant social relationships (Finkel & Campbell, 2001), and better decisions (McKeel, & Dixon, 2014). On the other hand, failures in self-control have been associated with many unfavorable outcomes, including criminal behaviors (Gottfredson & Hirschi, 1990), addiction (Madden, Petry, Badger, & Bickel, 1997; Baler, & Volkow, 2006), financial instability (Moffitt et al., 2011), aggressive actions (DeWall, Baumeister, Stillman, & Gailliot, 2007), and excessively overindulging (Vohs & Heatherton, 2000). In an annual Stress in America report (American Psychological Association [APA], 2011),
Shifting motivational priorities

one of the most frequent reasons given for being unable to make beneficial lifestyle changes was failing to practice self-control.

Although self-control research has highlighted a wide range of both constructive and destructive consequences, there are still some fundamental gaps in the current literature that hinder research from being applied to common dilemmas of self-control. For example, over the past two decades researchers have examined self-control as an internal resource with limited capacity (Baumeister & Heatherton, 1996; Muraven & Baumeister, 2000), yet a more recent exploration of self-control suggests individuals may demonstrate willpower through a shifting of motivational and attentional priorities (Inzlicht & Schmeichel, 2012). This more recent theory proposed that these changes in personal concerns are the primary drivers of performance decrements and self-control failure. This model introduces a theoretical perspective of self-control that is not dependent on resources; instead, it focuses on the individual’s underlying motivation to perform.

With an aim to bridge this gap between the contending theoretical perspectives, the present study empirically examines a motivational mechanism of self-control to provide clarity regarding how its components interactively function and influence important outcomes. To address the discrepancy in the literature, this study objectively evaluates the shifting priorities model introduced by Inzlicht and colleagues. Additionally, I examine the interrelations between key regulatory antecedents focusing on delay of gratification and time perspective. In particular, I assess how the interaction of these important self-regulatory variables influences shifting priorities. Another focus of this study is to extend and integrate one of the main mediational relationships (involving the role of motivation) in the shifting priorities model introduced by Robinson, Schmeichel, and Inzlicht (2010).
Shifting motivational priorities

The current study aims to incorporate the earlier findings on self-control from neuroscience researchers like Robinson, Schmeichel, and Inzlicht into the organizational behavior field in order to apply these findings to the motivational process and its impact in the workplace. Furthermore, the present study examines the implications of the shifting priorities model for work ethic and performance outcomes. Overall, this dissertation assesses direct and indirect relationships of the hypothesized self-control process on essential work-related behaviors.

This manuscript is organized as follows. First, I review relevant research on the conflicting perspectives on self-control. Second, I delve into a few constructs that are complementary to the concept of self-control, focusing on delay of gratification and time perspective. Third, I describe the influential function of motivation in the process of exerting self-control. Fourth, I explain the important work-related behavior and performance outcomes that can be influenced by the self-control process. Fifth, I describe a study that examines the motivational shifts involved in self-control exertion over time. Finally, I review the study’s results and further discuss the key findings.

Chapter 1: Self-Control

Self-control refers to a person’s capacity to modify or override impulses, immediate desires, and habitual reactions (Baumeister, 2002). Without the capacity for self-control, our habits and urges would control our lives and we would be unable to sustain goal-directed behaviors (Baumeister, Vohs, & Tice, 2007; Inzlicht, Legault, & Teper, 2014). Self-control relies on effortful executive control system processes that override automatic responses, impulsive tendencies, and emotions by detecting and deciding between competing response strategies (Ellis, Rothbart, & Posner, 2004). The literature has
explained that self-control allows individuals to inhibit immediate desires to attain a long-term goal, and it allows individuals to remain on-task during times when their thoughts may start to wander (Moffitt et al., 2011). Researchers in this area have developed multiple models of self-control with the aim of providing theoretical guidance. Currently, the most prominent model is the limited resource model of self-control (Muraven, Collins, Shiffman, & Paty, 2005). This theoretical perspective presents a resource-dependent concept that underlies self-control success and failure (Baumeister, Bratslavsky, Muraven & Tice, 1998). More recently, an alternative theory referred to as the shifting priorities model of self-control has been developed (Inzlicht et al., 2014). This revised model is not resource-dependent; instead, the idea is that motivational and attentional drivers explain self-control performance (Robinson et al., 2010).

**Limited Resource Model of Self-Control**

The limited resource model suggests that over time when self-control is exerted towards a task there will consequently be a reduction in later self-control exertion, also referred to as ego depletion (Baumeister, 2002). The resource model has hypothesized the concept of self-control resource depletion when engaging in effortful tasks, even in entirely unrelated domains (Hagger, Wood, Stiff, & Chatzisarantis, 2010). One of the original studies that examined the limited resource theory of self-control was conducted by Baumeister and colleagues, where they assessed the fluctuating resource-based qualities of self-control. Their study found that when individuals resisted the urge to eat fresh-baked cookies and sweets, there was a decrease in subsequent task persistence (Baumeister, Bratslavsky, Muraven, & Tice, 1998). To describe the limited resource model (also referred to in the literature as the strength model of self-control), a simplified metaphor was
introduced by Baumeister, Heatherton, and Tice (1994) suggesting self-control functions like a muscle, where exertion of control consumes resources much like a muscle expends energy through flexing, which leads to a depleted level of self-control (weaker muscle strength). Thus, the limited capacity of resources or strength that become consumed when used hinders further effort and diminishes one’s ability to exert control over time. This early demonstration of self-control failure has become a classic literature reference over the past two decades, being cited by thousands of articles (Muraven, Tice, & Baumeister, 1998).

The traditional experimentation used to examine the depletion of self-control resources was the sequential task paradigm, also referred to as the dual-task paradigm. The dual-task paradigm has two separate groups (experimental and control) completing two sequential tasks. For the experimental group, both tasks require exertion of self-control, whereas for the control group only the second task involves self-control exertion. Commonly, Task 1 is referred to as the ‘depletion task’ and Task 2 is referred to as the ‘outcome task.’ The experiment proposes that those in the experimental group will have lower performance on the second task in comparison to the control group. It is suggested that due to the limited resources being depleted after completing the first task, the experimental participants have fewer resources to draw from for the outcome task (Baumeister et al., 1998; Baumeister et al., 2007; Muraven, et al., 1998). Over the years, researchers have applied this paradigm to many self-control experiments.

Once these researchers had found that exerting self-control appears to deplete a limited resource that results in ego depletion and lower performance on subsequent tasks, they became interested in investigating the suspected resource. Initially, the literature
Shifting motivational priorities indicated that self-control relies on an individual’s glucose levels, where glucose acts as the limited energetic resource that gets depleted when used (Gailliot & Baumeister, 2007). Experimental tests of self-control even found that drinking a glucose beverage negated the performance impairments on subsequent self-control tasks by replenishing glucose levels (Gailliot et al., 2007). Interestingly, assessing blood glucose was the only direct examination aimed at determining the proposed energetic resource. Based on this research, the resource model suggested that self-control depended on a limited resource—likely glucose—that was depleted with use.

However, further research on the limited resource model has highlighted inconsistent support for the model. First, other researchers were unable to replicate the previous glucose results; for example, simply gargling a glucose solution and spitting it out (no ingestion of glucose) was found to improve self-control (Molden et al., 2012). Second, in further exploration of what influences self-control, studies found that the outcomes were not as clear as the muscle metaphor originally suggested. Scientists soon found a variety of results that indicated self-control depletion was dependent on a person’s positive affect (Tice et al., 2007), use of self-affirmation as a mental strategy (Schmeichel & Vohs, 2009), and belief in whether willpower is limited or unlimited (Job, Dweck, & Walton, 2010). Also, when Converse and DeShon (2009) assessed the sequential task paradigm used in the experimental design for ego depletion studies, the researchers found contradictory outcomes that suggested high self-control exertion could lead to either weaker or stronger self-control subsequently. Third, a meta-analysis by Hagger and colleagues (2010) had originally revealed a medium effect size ($d = 0.62$) for the effect of self-control depletion using the sequential task paradigm. Recent literature has suggested that because of
publication bias these meta-analytic results have likely been inflated. A new meta-analysis including both published and unpublished studies reanalyzed the previous findings and has presented evidence that suggests that the medium effect size reported in the original meta-analysis by Hagger et al. (2010) had included significant ‘small study’ bias (Carter, Kofler, Forster, & McCullough, 2015). Some studies have indicated a notably smaller depletion effect in comparison to the initial meta-analytic report (Tuk et al., 2015), while other researchers have altogether failed to replicate any depletion effect (Xu et al., 2014). Fourth, an effort from multiple research laboratories to replicate the depletion effect presented in the limited resource model seemingly failed, revealing a very small effect size ($d = 0.04$; Hagger et al., 2016). By interpreting the recent series of meta-analytic results, an unbiased evaluation indicates that the effect of self-control depletion is not discernable from zero (Carter et al., 2015). Finally, this model may also be limited in terms of precision and falsifiability. For instance, recently scholars have called into question the validity of the prominently used sequential task experiments (Lurquin & Miyake, 2017; Arber et al., 2017). Moreover, reviews of these self-control studies have indicated a ‘conceptual crisis’ and ‘replication crisis’ that has plagued much of the self-control research (Lurquin & Miyake, 2017). Specifically, the lack of validity in selected experiment tasks, improper evaluation of task performance, and various confounding variables have resulted in numerous mixed findings (Dang, Björklund, & Bäckström, 2017; Hagger & Chatzisarantis, 2016; Xu et al., 2014). For example, one study used a multiplication task as a depletion task (Stillman, et al., 2009), while another study used that exact activity as a non-depletion task for the control group (Burkley, 2008). Researchers have applied circular reasoning for selecting the depleting and outcome tasks, which leads to ambiguous outcome justifications
Shifting motivational priorities when comparing results across self-control studies (Lurquin & Miyake, 2017). Although easy to comprehend, the concept of resources has become increasingly ambiguous and may be difficult to falsify (Navon, 1984). Thus, the lack of replicability and mixed results raise questions regarding whether the depletion effect exists as described in the resource-based model. Therefore, the process by which self-control functions still lacks both clarity and reproducible findings.

Nonetheless, numerous experiments that have applied the sequential task paradigm have found that expending self-control at Time 1 impacts exertion of self-control at Time 2 (Hagger et al., 2010). The limited resource theory has directed attention to this phenomenon and applied the model to develop a better understanding of this essential aspect of self-control. Like any useful theory (Bacharach, 1989), the limited resource model has highlighted a neglected research area, operated as a generalizable heuristic, and specified key research boundaries. Also, the sequential task paradigm introduced in this line of research has been an adaptable design that has allowed experimenters to demonstrate the multitude of domains impacted by self-control exertion. However, more recently researchers have taken a step back to critique the current sequential task experiment approach. Although researchers continue to examine which tasks validly assess self-control exertion, it is also important to understand the inherent phenomena taking place during the depletion task itself. Scholars have stated that “What happens in the depletion task is crucial, as changes in performance, or lack of them, can falsify theories, constrain them or provide confirming evidence for one and disconfirming evidence for another” (Arber et al., 2017, p. 3). Thus, with conflicting results from studies that assessed the limited resource and other factors that influence self-control outcomes, there is an
Shifting motivational priorities

opportunity for research to apply a newer, more refined theory to better understand the
effect of the depletion task and its underlying functions over time.

**Shifting Priorities Model of Self-Control**

An alternative to the limited resource model was introduced by Inzlicht and Schmeichel (2012) to help clarify the issues highlighted during the past couple of decades of self-control research. These researchers presented the shifting priorities process model which is not dependent on a limited resource; rather, this theory focuses on the transformations in self-control exertion over time. In the shifting priorities model, there is a refractory period, whereby individuals begin to decrease their self-control exertion and become increasingly motivated by and attentive to their off-task wants (Milyavskaya & Inzlicht, 2016). Instead of self-control failure being predicted by depletion of finite energetic resources, the newer model suggests that a reduction of motivation and attention is the key driver of impaired self-control exertion across time. For instance, a study found that motivationally enticing the participants during a sequential task experiment eliminated the effect of ego depletion, which may imply that ego depletion occurs via a motivational deficiency as opposed to a resource deficiency (Muraven & Slessareva, 2003). In this largely revised model of self-control, Inzlicht, Schmeichel, and Macrae (2014) propose that:

The refractory period of self-control is the product of evolutionary pressures motivating organisms to balance their desires for exploitation versus exploration (Cohen, McClure, & Yu et al., 2007); this adaptive function translates further to a natural tendency to seek a balance between desires for externally rewarded labor versus inherently rewarding leisure (Kool & Botvinick, 2014). From this
Shifting motivational priorities

standpoint, self-control failure is less about resource depletion and more about the motivated switching of task priorities from ‘have-to’ to ‘want-to’ goals. (p. 127).

Thus, this model proposes a shift in motivational factors oriented towards gratifying a person’s desires and away from suppressing them. Accordingly, over time self-control exertion leads individuals to become less motivated to apply continued effortful control and more motivated to participate in something that is aligned with their personal interests (Inzlicht & Schmeichel, 2012). From a cognitive perspective, the shifting priorities model explains that in order to attain goals, individuals can apply self-control through (any or all of these) three parallel processes: task motivation, time-on-task monitoring, and operating functions (Robinson, Schmeichel, & Inzlicht, 2010). Individuals apply self-control to proceed towards valued goals while monitoring their progression. Also, there must be a sincere desire to meet the established standards to expend self-control – that is, without motivation, one would not be able to successfully exert self-control.

The shifting priorities model proposes that exertion of self-control at Time 1 initiates a series of interdependent and iterative shifts in motivational orientation and attentional focus that result in poorer self-control at Time 2 (Inzlicht & Schmeichel, 2012). The model suggests that after self-control is exerted to perform a task there is a shift in a person’s motivation. It is believed that the individual’s motivation is directed away from inhibiting their desires and redirected towards doing what they find intrinsically enjoyable. Thus, expending self-control leads individuals to become less motivated to exert effortful control; instead, they become more motivated to gratify their personal interests. Simultaneous with the change in motivation, there is a shift in attention, where the person’s focus is drawn away from cues that indicate a need for exercising control and toward cues
Shifting motivational priorities

that emphasize gratification (Inzlicht et al., 2014). Based on the concept that self-control is exerted when there is a monitored discrepancy between current and desired states (Carver & Scheier, 1982), the shifting priorities model explains a shift in the monitoring process such that after self-control exertion people may become less cognizant of cues that highlight the incongruity between the current and desired states. Rather, they become more attentive to signals related to desirable gratification and rewards.

This model combines work from a variety of research areas, including fatigue psychology (Hockey, 2013), neuroscience (Botvinick & Braver, 2015), the intrinsic cost of self-control (Inzlicht, Gervais, & Berkman, 2015; Kool & Botvinick, 2014), evolutionary psychology (Tooby & Cosmides, 1992), and the opportunity cost model of subjective effort (Kurzban, Duckworth, Kable, & Myers, 2013). The shifting priorities model proposes that the reason self-control diminishes over time is due to evolutionarily beneficial selection of goal pursuit that has advanced throughout animal and human life (Tooby & Cosmides, 1992). This theory suggests that the decline of self-control is due to motivational shifts away from effortful tasks and towards more desirable activities. Previous self-control exertion impacts the valuation process by changing the value of further effort exertion and the value of satisficing. Initially, exerting effortful control on a task might shift the attributed value associated with continuing to exert self-control, which may lead an individual to engage in the hedonic proximal choice as opposed to the distal future-oriented behavior. Basically, following mental effort exertion (necessary in most cases of self-control) there is a reduction in perceived utility of further exerting mental effort and an increase in the value of indulging in the tempting impulse (Kool & Botvinick, 2014).
Shifting motivational priorities

Throughout time, people have had a constant struggle with the problem of balancing task engagement and disengagement by assessing their needs for exploitation versus exploration. *Exploitation* behaviors seek out opportunities that will offer identifiable immediate rewards, whereas *exploration* behaviors seek out future rewards by engaging in activities aimed towards long-term successes (Cohen, McClure, & Yu, 2007). Thus, the usefulness of exploiting known sources of reward compete against the value of exploring for alternative reward opportunities (Tooby & Cosmides, 2005). Many factors influence how individuals decide between exploitation or exploration including missing out on other opportunities once committing to an action (Kurzban et al., 2013), perception of how much effort is required for completing the action (Kool, McGuire, Rosen, & Botvinick, 2010) and the changes in value of the action over time (Kool & Botvinick, 2014). Adaptation in humans suggests that engaging in a task for too long can be evolutionarily aversive (Kurzban, et al., 2013); therefore, time spent on have-to behaviors makes want-to behaviors more intrinsically motivating (Inzlicht et al., 2014).

Research has shown that individuals commonly construe behaviors as actions they have to do or as actions they want to do. These two personal drivers are referred to “shoulds” and “wants” (Milkman, Rogers, & Bazerman, 2008) or “have-to” and “want-to” motivations (Inzlicht et al., 2014). Both have-to and want-to motivations are dynamic and subjective, and they are influenced by a combination of the reward temporality and whether the behavior is perceived as labor or leisure (Inzlicht, Berkman, & Elkins-Brown, 2016). The drive behind have-to goals is formed from a sense of obligation and duty to oneself or others. On the other hand, want-to goals are intrinsically important and gratifying. People will ultimately choose to put effort (in varying proportions) towards both have-to and want-
Shifting motivational priorities

to goals. When individuals perceive that they have put forth effort to fulfill have-to goals they are likely to be biased towards want-to goals (Tobin, Greenaway, McCulloch, & Crittall, 2015). This concept is supported by the self-licensing effect in DeWitt Huberts, Evers, and DeRidder (2014) whereby people who successfully refrained from eating snacks frequently gave themselves permission to indulge afterwards. So, when a person does not favor continuing self-control exertion, motivation tends to shift from have-to towards want-to priorities. Drawing from the example described in the beginning of this paper, if the aspiring musician wants to relax and watch television, but has to practice her solo for the piano recital, then the value of relaxing and watching her favorite shows will increase when she is exerting self-control for a while, making her more likely to indulge in a couple episodes. Nevertheless, if she truly wants to rehearse on her piano, then this choice will be much easier to make, and even if she feels that she has already exerted self-control for some time, she will practice her piano because that is a source of joy for her.

Studies have begun to support this mechanism of priority shifting by showing that various reward-based manipulations intended to either gratify a momentary desire or change the perceived value of effort exertion can eliminate the ego depletion effect (Boksem, Meijman, & Lorist, 2005; Inzlicht et al., 2014; Inzlicht & Berkman, 2015). A few examples of rewards used to effectively replenish self-control capacity after initial exertion are: watching one’s favorite television show (Derrick, 2013), cigarette smoking ( Heckman, Ditre, & Brandon, 2012), highlighting personal core values (Schmeichel & Vohs, 2009), and improving positive emotions (Tice, Baumeister, Shmueli, & Muraven, 2007). One study on the neuroscience of self-control measured certain neural mechanisms associated with effortful control by examining brain signals for error-related negativity
Shifting motivational priorities (Boksem et al., 2005). Boksem and colleagues (2005) found that increasing the value of the rewards for persisting on a task led to a full recovery (at the level before depletion) of otherwise weakened signal potentials. Specifically, these results support the theory underlying the shifting of priorities because they suggest different ways self-control can become replenished following initial exertion. These findings are incompatible when applying the limited resource model to explain fluctuations in self-control capacity (Gailliot & Baumeister, 2007; Muraven & Baumeister, 2000), especially because self-control was often restored without any manipulations to physical resources. Even though several researchers have found evidence that immediate gratification is influential in self-control shifts, there has been no research to date that has focused on directly assessing the role of motivation in mediating the self-control refractory period (Inzlicht et al., 2016; Milyavskaya & Inzlicht, 2017). Importantly, a main purpose of the present study is to provide a direct empirical examination of the motivational mechanism in the shifting priorities self-control model.

Chapter 2: Delay of Gratification

A recurring challenge in life is that people must make decisions between an immediate reward and a better future reward that requires investing more time and effort. A few examples are choosing to not act on a cigarette craving to minimize health issues later in life, choosing to not indulge in impulse shopping to save money for a home purchase, and choosing to not eat invitingly sweet treats to improve weight loss. These instances refer to delay of gratification, which is defined as the tendency to override immediate satisfaction for a more valuable reward in the future (Mischel, 1974). This construct of voluntarily postponing a salient reward for later has been documented to share
characteristics with self-control (Duckworth, 2011; Duckworth & Kern, 2011; Krueger, Caspi, Moffitt, White, & Stouthamer-Loeber, 1996; Romer, Duckworth, Sznitman, & Park, 2010). Regarding both voluntary delay of gratification and self-control, the choice to delay is self-imposed (Mischel, 1974). Therefore, if an individual wants the delayed reward, they have to forego the readily available outcome for the greater reward alternative by allocating more time and effort (McGuire & Kable, 2013; Mischel, Ebbesen, & Zeiss, 1972).

Interest in the topic of delaying gratification started over six decades ago, and this behavior was primarily examined with children ranging from toddlers to pre-teens (Mischel, Shoda, & Rodriguez, 1989). The original paradigm that investigated individual differences in delay of gratification is popularly known as the “marshmallow study.” In the 1970s, this classic experiment by Mischel and colleagues assessed the relationship between attention and self-control via the delay of gratification paradigm (Mischel et al., 1972; Mischel & Baker, 1975). In their studies, a preschool aged child is asked to make a choice between a greater, more preferred reward and a less preferred reward. These rewards were treats like marshmallows and cookies specifically chosen to be salient for this young age group (Mischel & Baker, 1975). The child is seated at a table where there is a single marshmallow set on a napkin placed directly in sight. The child is instructed to choose whether he/she wants to: A) wait (for an unspecified amount of time ranging around 15 to 20 minutes) until the confederate returns with an additional marshmallow (getting to have two marshmallows following the wait), B) not wait at all and have the one immediately available marshmallow, or C) ring the bell that is provided at any time during the waiting period to indicate that he/she does not want to wait any longer, thus only receiving the single, immediately available marshmallow. If the child chooses to wait, he or she must
Shifting motivational priorities

continue to resist the tempting marshmallow; consequently, the length of time the participant can wait and override those temptations in order to receive the greater reward is the operationalization of his/her ability to delay gratification (Mischel, 1974). Differences in how long individuals can delay receiving their reward reflects their personal tendencies toward self-control and impulsivity (Casey et al., 2011; Eisenberg, Smith, Sadovsky, & Spinrad, 2004).

Several studies have highlighted the significant implications that the ability to delay gratification may have on development throughout one’s lifetime (Ayduk et al., 2000; Mischel et al., 2010; Bembenutty, 1999). Previous self-regulation research suggests that delay of gratification is better than intelligence in predicting academic achievements (Mischel et al., 2010). Thus, being able to delay gratification may reflect a desire to strive towards beneficial future outcomes. Also, some studies found that those with higher delay of gratification ratings scored higher on intelligence tests (Duckworth & Seligman, 2005; Mischel, 1974). In the original marshmallow studies, the children with high delay of gratification were also found to have higher attention regulation abilities (Mischel, 1974). Research results have shown that those who have been rated high in delaying gratification are more likely to have better self-efficacy, goal orientation, motivation, life satisfaction, and self-worth (Mischel, 1966; Mischel & Metzner, 1962; Rosenbaum & Smira, 1986; DeWall, Baumeister, Stillman, & Galliot, 2007). On the other hand, people with low delay of gratification tend to be more likely to show aggression, engage in risky activities, abuse drugs, and perform delinquent behaviors (Gottdiener, Murawski, & Kucharski, 2008; Krueger et al., 1996; Rosenbaum & Smira, 1986). Interestingly, one study found a shielding effect from delay of gratification, such that delay had a negative relationship with
Shifting motivational priorities

sensitivity to rejection which in turn protected against reduced personal well-being over time (Ayduk et al., 2000).

The classic literature has even suggested that, “the individual’s ability to resist temptations may be facilitated by how well he attends to a task” (Mischel et al., 1972, p. 204). The impulses to move towards pleasure and away from displeasure are critical for an organism’s survival; unfortunately, these temptations to obtain rewards that are available here-and-now are frequently at odds with counteracting, goal-driven processes (Inzlicht et al., 2014). Therefore, effective delay of gratification requires people to inhibit the drive towards immediate pleasure, indefinitely postpone receipt of greater reward, and deal with displeasure for a little (Duckworth, Tsukayama, & Kirby, 2013). In 2009, the National Institutes of Health guidelines (NIH, p. 2) recognized that delaying gratification has a significant influence on public health in the United States, citing more than sixty years of data that linked lower delay of gratification to substantial problems in society (Hoerger, Quirk, & Weed, 2011; Lee, Lou, Wang, & Chiu, 2008). Despite the prominence of this construct in research, there has been a notable lack of studies using adults (Forstmeier, Drobetz, & Maercker, 2011). The present study aims to examine delay of gratification in an adult sample, but more importantly examines the implications of this construct for have-to and want-to priority shifts over time. More specifically, this study examines delay of gratification as an antecedent that influences the self-control exertion process.

Chapter 3: Time Perspective

Time is a complex issue that encompasses many aspects of an individual’s life, and can be accounted for objectively and subjectively. Objectively, chronological and serial time, which are rather invariant, absolute, automatic, and linear quantifications, provide
the specification of time progression during an event or an action (Lloyd & Goldmann, 2009). Clark (1985; 1990) states that this objective viewpoint represents an approach that is independent of man. This perspective was used in the early time and motion studies by Frederick Taylor and continues to be a topic for researchers to ponder in regards to getting tasks completed more efficiently. Subjective time has been described as an internal temporal processing “pacemaker” or “moment counter” that has been proposed to involve neural structures which allow humans to perceive time from a personal viewpoint (Grondin, 2009). This subjectivity has been described as “time not of measurement but of human activity, of opportunity,” (Kinneavy, 1986, p. 14). This concept of time appears to be much more subjective, natural, and socially formed (Jacques, 1982). In Katz’s (1980) manuscript “Time and Work,” he argued for the need to include differences in subjective time perspective in order to attain a better comprehension of behaviors at work.

In this paper, the objective view of time as an unalterable measure of reality is not a primary focus; instead, we concentrate on the idea that time is socially constructed (Bergmann, 1992) and further delve into how it relates to delaying gratification and self-control. In the workplace, management would greatly benefit from understanding how closely time perspective is related to organizational productivity and to leverage perceptions of time as a resource to be managed in the interest of organizational goals. The effects of time perspectives have been discussed in previous literature as being influential in areas such as decision making, goal setting, group behaviors, and motivation (McGrath, 1990; Savickas, Silling & Schwartz, 1984; Lens & Gailly, 1980; Lasane & Jones, 1999; Lennings, 1991; Rachlin, 1995). In most facets of the organization, there is potential for time orientations to play a role in decision making (Schriber & Gutek, 1987; Kluckhohn &
Shifting motivational priorities

Strodtbeck, 1961; Hofstede, 1980). An individual does not leave behind his/her cultural and personal views of time when entering an organization; therefore, it appears to be important to examine how an individual’s view on time may impact their actions during self-regulatory activities.

Vital to an individual’s experience of time is the information they can recall from the past and how they utilize this information to visualize the future. Individuals perceive time in the present only by connecting themselves to a past and to a future (Jackson, 2006). Individuals may invest effort differently based on how they value near versus far time perspectives (Feldman & Hornik, 1981; Jackson, 2006). Researchers have explained that all individuals possess multiple time perspectives (past, present, and future); however, the levels of the dimensions vary between people. The psychological separation of time into the past, present, and future time perspective frameworks has been theorized by Zimbardo and Boyd (1999) to have a strong effect on human behavior. In addition, neuroscience research has found that brain activity has significantly different modulations when individuals think about themselves in past versus present versus future contexts (D'Argembeau, Stawarczyk, Majerus, Collette, Van der Linden, & Salmon, 2010). The findings indicated that individuals tend to have distinct patterns of neural activity in the medial prefrontal cortex when considering themselves in the present moment, whereas the right inferior parietal cortex was identified as an active neural area when considering themselves in the future (D'Argembeau, et al., 2010). These time perspective patterns are used in encoding, storing, and recalling events that are experienced, in addition to developing expectations, contingencies, goals, and innovative situations (Zimbardo & Boyd, 1999).
Present Time Perspective

Present time perspective refers to an individual’s representation of the current psychological moment (Sobol-Kwapinska, 2009). People who are primarily present oriented concentrate on what happens in the here and now without much consideration of the past or future. These individuals view the past as “what’s done is done” and the future as out of their control (Boyd & Zimbardo, 2005). Studies have identified two features of present time perspective: present-hedonistic and present-fatalistic (Zimbardo & Boyd, 1999). A present-hedonistic person lives in the moment, values self-indulgent gratifications, relishes high-intensity activities, pursues thrills and novel sensations, and is open to sexual adventures and casual relationships (Zimbardo & Boyd, 1999). Freud (1955) would refer to these individuals as seeking the “pleasure principle.” People who perceive the present in this context tend to be more likely to take risks in life (Keough, Zimbardo, & Boyd, 1999). This orientation toward present indulgence yields little concern for future consequences by avoiding planning for emergencies and cost-benefit analyses. People with high levels of present-hedonistic time orientation are more likely to succumb to temptations that often result in addictions, job site injuries, and unsuccessful academic and career performance (Zimbardo & Boyd, 1999).

The literature demonstrates that people who view the present as highly pleasurable are more likely to place more weight on the positive appeal of immediate deliberations and short-term goals, especially when the goals are tangible (Keough, Zimbardo, & Boyd, 1999; Vohs & Schmeichel, 2003). Another study found that present-hedonists self-reported high intentions to achieve workplace goals, but the results showed their behaviors were inconsistent with their intent; only 16% of the present-hedonistic individuals who set
challenging and specific goals to accomplish in a two-week period performed tasks and behaved in ways that led them to achieve the goal in the allotted time (Horstmanshof, & Zimitat, 2004). It is possible that these individuals were more likely to not strive towards these goals, and instead become distracted by other events that became more enjoyable at the time than working towards the set goal. One study found that these individuals tended to have lower education, shorter work period histories, and more counterproductive work behaviors like coming to work on drugs/alcohol and stealing from the company (Luyckx, Lens, Smits, & Goossens, 2010).

In contrast, people who view time as present fatalistic have helpless and unchangeable beliefs towards the future. This concept of time is usually accompanied with the attitude that the future is predetermined and impermeable to individual actions (Vohs & Schmeichel, 2003). Present fatalists are incapable of seeing themselves as active means to effectively develop facets of their lives, whether it is at home or at work (D’Alessio, Guarino, De Pascalis, & Zimbardo, 2003). These individuals feel they are controlled by the decisions of their supervisors, bosses, and company executives at work, and take little blame for mishaps on the job (Keough, Zimbardo, & Boyd, 1999). Studies have noted that present-fatalistic time perspective is highly correlated with low self-esteem, depression, anxiety, and suicide (Boyd & Zimbardo, 2005; Drake et al., 2008). In one study, these individuals were found to do worse in situations that allowed them to set their own goal than when they were assigned the goal by a supervisor (Burke, 1986). Overall, research has found a significant link between present time orientation and societal problems, such as stealing, unsafe sex, obesity, and speeding (Jochemczyk, Pietrzak, Buczkowski, Stolarski, & Markiewicz, 2017; Birkás, & Csathó, 2015).
Future Time Perspective

Future time perspective is defined as a person’s cognitive conceptualization of the future (Park & Jung, 2015; Walker & Tracy, 2012). Individuals who exhibit high future time perspective are focused on striving towards future rewards and goals (Zimbardo & Boyd, 1999). Future-oriented people strategize a plan for achieving their goals and accomplishing requirements for the long-term (Lens & Tsuzuki, 2007). Future time perspective guides all choices through manipulation of cognitive representations for potential outcomes regarding one’s accountability, obligations, costs, and benefits (Strathman, Gleicher, Boninger, & Edwards, 1994). Compared to present-oriented individuals, these individuals are found to be better at formulating and envisioning goals and the steps needed for those goals to be reached (Lens, 1986). Studies have found that higher future time orientation leads to fewer risky behaviors at work, such as consistent work attendance and abstaining from alcohol use before/on the job (Boyd & Zimbardo, 2005; Lens & Tsuzuki, 2007). Also, recent research has found that employees with high future time perspective have higher job satisfaction, engagement, organizational citizenship behaviors, and performance (Kooij, Tims, & Akkermans, 2017; Weikamp & Goritz, 2016).

Due to their ability to effectively weigh future consequences, people high in future time orientation have been associated with many positive life outcomes, such as greater achievements in academics and career, better socioeconomic status, and fewer mental and physical health issues (Keough, Zimbardo, & Boyd, 1999; Simons, Vansteenkiste, Lens, & Lacante, 2004; Lens & Tsuzuki, 2007). Zimbardo and Boyd (1999) found very strong relationships between future time-perspective, conscientiousness, and need for
Shifting motivational priorities

achievement. Even though people generally tend to exaggerate their intent towards goals (Trope & Liberman, 2003), one study found a correlation between high future time perspective and stronger determination towards goal alignment (Aspinwall, 2005). Research has highlighted that considering future consequences helps with behavior regulation, performance management, and assessing if intended behavior will lead to goal attainment (Husman & Shell, 2008; Park & Jung, 2015). Social psychologists have found that people who considered a longer time frame were more likely to prioritize knowledge acquisition goals, in comparison to those with shorter time frames who emphasized emotionally salient goals (Carsten, Isaacowits, & Charles, 1999).

Studies that have focused on individual differences in time perspective and its relationships with proactive behaviors have found a significantly predictive role of future time perspective with engagement in helping behaviors, environmental sustainability, and purchasing healthy and biodegradable products (Joireman, Van Lange, & Van Vugt, 2004; Milfont & Gouveia, 2006). A meta-analysis indicated a strong, meaningful link between future orientation and performing proactive behaviors (Milfont, Wilson, & Diniz, 2012). Also, the literature has highlighted the beneficial part that future time perspective plays in improving well-being (Sailer et al., 2014), strengthening stress-related coping skills (Chua, Milfont, & Jose, 2015; Papastamatelou, Unger, Giotakos, & Athanasiadou, 2015), decreasing procrastination tendencies (Sirois, 2014, 2016), and planning for retirement (Earl et al., 2015). An earlier study by De Volder and Lens (1982), integrated future time perspective into cognitive-motivational theories, and found that high orientation towards distant goals was significantly related to higher grade point averages and longer study
Shifting motivational priorities

persistence. Interestingly, these students reported higher valence and instrumentality towards reaching their goals, which helped them work harder towards their objectives.

These time perspectives influence our behavior; therefore, they are essential in comprehending our actions, expectations, goals, and motivations for the future (Kauffman & Husman, 2004). Research has indicated a relationship between an individual’s time orientation and academic achievement (Lasane & Jones, 1999; Peetsma, 2000), behavioral consistency of intentions (Eyal, Sagristano, Trope, Liberman, & Chaiken, 2009), decision-making (Savickas, Silling, & Schwartz, 1984; Suddendorf & Busby, 2005), setting goals (Lasane & Jones, 1999; Lens & Gailly, 1980), and motivation in the workplace (Husman & Lens, 1999; Phalet, Andriessen, & Lens, 2004). Organizational psychologists have identified present and future time perspectives as essential to better understand employee behaviors, noting that past time perspective is linked more to clinical studies. Even though individual studies have suggested important relationships, motivation theorists have not thoroughly integrated time perspective as an influential variable that impacts a person’s drive (Rousseau & Fried, 2001). It has been asserted that by combining time orientation as a fundamental component of motivation, these theories could increase their generalizability, validity, and utility (McGrath & Tschan, 2004; George & Jones, 2000). The present research attempts to move in this direction by examining time orientation as another antecedent influencing the self-control exertion process. More specifically, the view one has towards future goals impacts their within-person motivational shifts over time, which underlies the refractory period of self-control. Additionally, the interaction effect of time perspective and delay of gratification are directly examined, aiming to empirically clarify the role of these factors.
Chapter 4: Motivation

There are numerous perspectives on being motivated to persist towards a desired goal. The term “motivation” can imply several phenomena depending on the research context, so it is beneficial to provide a clear definition. This paper refers to motivation as the “orienting and invigorating impact, on both behavior and cognition, of prospective reward and punishment” (Botvinick & Braver, 2015, p. 85). This definition allows for a more precise scope for the present study where the motivational context influences both the intensity and direction of self-control exertion. Cognitive motivation theorists aim to comprehend the underpinnings of people’s behaviors, the desires associated with their goal pursuit, and why they choose to pursue those actions. In motivational research, a few of the most prominent cognitive models in the literature include: cognitive evaluation theory (Deci & Ryan, 1980), self-perception theory (Bem, 1972), personal causation theory (DeCharms, 1968), social cognitive theory (Bandura, 1986), self-determination theory (Deci & Ryan, 1985), and choice theory (Rachlin, Logue, Gibbon, & Frankel, 1986).

The notion of a person’s intentions is central to several cognitive models in the area of motivation. Research indicates that cognitive evaluation theory, self-perception theory, and personal causation theory share a common concern with the factors that influence an individual’s comprehension of his/her behavior. The motivational model in cognitive evaluation theory proposes that intrinsic motivation is influenced by a variety of underlying factors that impact perceptions of autonomy and competence (Deci & Ryan, 1980). Depending on how the reward is perceived (motivational, controlling, or informational), the reward can strengthen or weaken one’s sense of competence and autonomy. Self-perception theory is explained as an inferential process that is self-directed (Bem, 1972).
Shifting motivational priorities

For instance, when a person sees another individual engaging in a task for no apparent reward, that person makes an inference that the other individual is intrinsically driven to perform the task (to the extent that external reward contingencies are not perceived). This theory proposes that when there are salient external rewards associated with performing certain behaviors, the behavior will be attributed to the reward contingencies. On the other hand, if there are no salient external rewards associated with the behaviors, then those behaviors will be attributed to the performer’s desires, dispositions, and personal interests (Bem, 1972). Next, the personal causation theory describes personal causation as starting a behavior with the intention of producing some change within the environment (DeCharms, 1968). In the personal causation model, these behaviors are defined as motives, which include learning attributes such as achievement and individual knowledge (DeCharms, 1968).

Later, social cognitive theory introduced by Bandura (1986) suggested that human behavior is dependent on shared interactions between a person’s beliefs, thoughts, behaviors, and environment. In particular, this theory highlights the influence of one’s self-efficacy on his/her choice of task, persistence, effort, and achievement (Bandura, 1989). Numerous studies have applied the construct of self-efficacy to examine motivational factors of self-perception (Bandura & Schunk, 1981; Zimmerman & Bandura, 1994). In contrast to the previously described motivation theories, the theory of self-determination differentiates between internal regulation that is self-determined versus controlled (Deci & Ryan, 1985). Actions motivated through self-determination are solely volitional in nature (i.e., they are based on how strongly the individual intrinsically wants to engage in the action; Deci, Vellarand, Pelletier, & Ryan, 1991). Actions motivated through controlled
Shifting motivational priorities

processes are driven by an interpersonal force (i.e., they are based on how strongly the individual feels that he/she extrinsically has to engage in the action; Deci, et al., 1991). Intrinsic motivation has been found to predict successful performance in various life domains including work, sports, academics, and health (Conroy & Elliot, 2004; Hagger & Chatzisarantis, 2009; Walker, Greene, & Mansell, 2006). This theory states that a behavior that is self-determined identifies choice as the key regulatory process, and a behavior that is controlled identifies compliance as the main regulatory process (Ryan & Deci, 2000).

Next, choice theory proposed by Rachlin and colleagues (1986) describes motivation through one’s preferences towards engaging in behaviors and/or choosing the behavior’s consequences. This theory indicates that one’s choice for the type of rewards or choice for when to receive rewards can shield the potentially negative impact of extrinsic reinforcement on intrinsic motivation levels (Ryan & Deci, 2000). Therefore, choice has been identified as a critical component in multiple motivation theories. Although there is strong evidence indicating that these motivational factors signify important driving forces in human behavior, there are very few theoretical and empirical accounts that systematically evaluate these dynamic higher order human motivations using individual choices encompassed in a single model (Elliot, 2006).

**Choices in Motivational and Volitional Action Phases**

According to motivation theorists, whether individuals make progress in goal striving depends on both the motivation behind their original choice to engage in an action and the choice to continue persisting in those actions towards goal achievement (Ajzen, 1985; Gollwitzer, 1990). Early research in this area referred to this conceptual distinction as choice motivation and control motivation (Kuhl, 1984). These two related types of
motivation affect choices, actions, and performance through distal (perceived performance-utility, effort-utility, and performance-resource relationships) and proximal (self-monitoring, self-evaluation, and self-reaction) processes (Kanfer & Ackerman, 1989). Choice motivation is defined as a person’s decision towards one action over other action alternatives, and control motivation is defined as motivating factors that influence the chosen action during attempts to achieve the goal (Kuhl, 1984).

Based on the Rubicon Model of Action Phases introduced by Heckhausen and Gollwitzer (1986), enacting a behavior requires progression through distinct phases: motivational (intentional) and volitional (post-intentional). Although intentions are essential, they are not sufficient to start and execute planned behaviors. Once the choice has been made and intended goal-directed action has initiated, the volitional phase uses environmental cues to help efficiently recall and implement the intended behavior (Heckhausen & Gollwitzer, 1987). The Rubicon model integrates various goal-oriented behaviors into a multi-phase model of action. Instead of the hierarchical, vertical action models that consider the course of action through the progression of superordinate, abstract goals to subordinate, defined goals (Carver & Scheier, 1990; Hacker, 1985), the Rubicon action model provides a horizontal time perspective that views the course of action as a series of phases (Gollwitzer, 1990).

Heckhausen and Gollwitzer’s action model defines motivated goal pursuit via four consecutive action phases, starting with the pre-decisional, followed by the pre-actional, then the actional, and finally the post-actional phase. The successive phases begin with the emergence of a person’s desires that impact the chosen action and follows through to the valuation of the action once goal striving is completed. This action model has been used to
conceptualize the motivational process of choice (Vohs, Baumeister, Schmeichel, Twenge, Nelson, & Tice, 2014), where the four phases are partitioned by three clear transition points: making a choice, initiation of the chosen action, and conclusion of the chosen action (Gollwitzer, 1990). Initial deliberation of potential options entails comparing the positive and negative aspects to form a preference. Thus, making the choice involves deciding on one option among the alternatives and committing to engage in that action. The implementation of the choice encompasses the performed behaviors that accomplish the chosen action.

The first phase, pre-decisional, is characterized by the individual’s personal desires and interests (Heckhausen & Gollwitzer, 1987). Consequently, cognitive deliberation of certain desires stem from competing motives (McClelland, 1980). When desirability and feasibility are highest for a given action, the individual will prefer that action over the others. This suggests that the desire must be transformed into an intention through the determination to fulfill wants (Gollwitzer, 1990). This model explains that the acquired intention towards the goal is indicative of the person’s sense of obligation. The second phase described in the Rubicon model is the pre-actional phase, which is when the preferred action has been chosen but intended behaviors have not yet been initiated. This phase primarily involves cognitive planning (when and where to start the action, how to do the action, what duration is needed) that is necessary to accomplish the chosen action. The feeling of obligation from the initial phase of action is integrated into this phase during consideration of issues regarding how to persist towards completing the chosen action. Next, the actional phase entails the actual initiation of the relevant actions. The intensity and direction of persistence during this phase is a function of the person’s sense of desire.
Shifting motivational priorities

and obligation towards the chosen goal. Underlying the initiation of action, “the amount of volitional strength serves as a kind of threshold value for the individual’s effort exertion” (Gollwitzer, 1990, p. 58). The final phase in the Rubicon model is the post-actional phase, which requires goal achievement. Completion of the chosen goal results in evaluating whether the goal desirability and obligation was worth the intensity and direction required to perform the actions. These action phases highlight the lower-level goal process through which intended actions are implemented during one’s chosen goal pursuit.

**Have-to & Want-to Motivation**

Schelling (1984) stated, “everybody behaves like two people…one who wants a lean body and the other who wants dessert…the wayward one needing only to get occasional control to spoil the other’s best laid plans” (p. 290). A person’s needs, interests, and desires affect their goal choice and associated goal-directed behaviors. In motivational theory, it has been suggested that there should be a focus on specific motivations that stem from feeling obligated to strive towards particular behavioral goals and the chosen actions that individuals perceive as desirable and rewarding (Botvinick & Braver, 2015). A prominent distinction that underlies the chosen goal and striving behaviors relates to the nature of motivations – specifically, whether the goal is perceived as driven by the sense of “have-to” or “want-to” (Inzlicht, Schmeichel & Macrae, 2014; Milyavskaya, Inzlicht, Hope & Koestner, 2015). Bazerman and colleagues (1998) introduced these competing motives referred to as the internal want/should conflict. Their article discussed the intrapersonal struggle referred to as “multiple-selves,” which describes the tension between what individuals want to do and what they believe they should do. The multiple-selves dilemma has been depicted as two competing selves: the should self and the want self. The
Shifting motivational priorities

popular media depicts the should self as the angelic self-reflection perched on the right shoulder, encouraging the person to behave the way they think they should. On the other side, the want self is portrayed as a devilish self-reflection enticing the person to behave the way they want. This modern portrayal of multiple-selves dates back to classic ancient tales, such as Ulysses and the enchanting Sirens in Homer’s *The Odyssey* and the biblical bitten apple of Adam and Eve.

Researchers have examined similar concepts involving various conflicting facets internal to oneself, such as actual-self, ideal-self, can-self, ought-self, and future-self (Higgins, Roney, Crow, & Hymes, 1994). The phenomenon of multiple selves was proposed to function through a continuum of underlying intrapersonal processes such that, “when people are asked what they want, their responses will be emotional, affective, impulsive, and hot-headed, whereas when they are asked what they should do, their responses will be rational, cognitive, thoughtful, and cool-headed” (Bazerman, Tenbrunsel, & Wade-Benzoni, 1998, p. 229). Thus, a person’s have-to goals are performed based on a sense of should, duty, and obligation, whereas want-to goals are the intrinsically enjoyable and fun (Milkman, Rogers, & Bazerman, 2008; Ryan & Deci, 2000).

The intrapersonal struggle has mostly been examined via the intertemporal choice model (Milkman et al., 2008), until recently when the overlap with motivational theories was recognized (Milyavskaya et al., 2015). Specifically, recent research has highlighted motivation-related shifts regarding the competing objectives for have-to and want-to goals (Inzlicht & Berkman, 2015). This line of research by Inzlicht and colleagues (2014) has introduced the newer notion that individuals experience a shift in motivation towards want-to goals and away from have-to goals. More importantly, this shift in goal motivations is
suggested to be the reason that self-control exertion may become reduced over time, not because of the popularly held notion of depletion of limited resources. Researchers have noted the adaptive properties underlying relaxation of efforts for when a person’s goal has been reached in order to allow the person to rest and switch attention towards other goals (Fishbach & Dhar, 2005; Förster, Liberman, & Higgins, 2005). The subjective feeling of effort is central to the distinction between have-to and want-to motivational shifts. The flow phenomenon, where a person experiences enjoyment from concentration on a challenging task (Csikszentmihalyi, 1990), suggests that not all demanding behaviors feel subjectively effortful.

Accordingly, motivation contributes directly to the person’s subjective valuation for every choice he/she makes. There are multiple sources of motivation (e.g., external incentives, societal standards, interpersonal pressures, intrinsic gratification, unfulfilled needs, personal values) that can shift the subjective value related to each choice, and ultimately lead to further self-control exertion or failure (Milyavskaya et al., 2015). Furthermore, contributions from motivational factors typically stem from a sense of potential gratification (e.g., personal enjoyment, fulfilled needs, extrinsic value), but a sense of potential loss can also be influential. For instance, researchers found that self-control exertion increased when a monetary fine was imposed on failures of self-control (Schwartz, Mochon, Wyper, Maroba, Patel, & Ariely, 2014). Similarly, individuals’ needs can impact the goals that they set for themselves, which drives want-to motivation during the valuation process (Milyavskaya, Nadolny & Koestner, 2014). For example, one study found that when the need for autonomy was threatened, the drive to make choices towards restoration of autonomy became more salient (Radel, Pelletier, Sarazzin, & Milyavskaya,
Shifting motivational priorities

“Overall, the reasons why a person pursues a given outcome affect the value placed on each choice… the immediately pleasurable behavior, the distal goal, or, in some cases, another alternative choice.” (Milyavskaya & Inzlicht, 2017, p. 14).

Previously, the literature in this area proposed that motivational drive could yield hypothetically limitless self-control. Of course, in a theoretical scenario, self-control may persist indefinitely if the motivational drivers for leisurely behaviors were consistently overridden. However, this hypothetical scenario has many practical obstacles that make it improbable. First, the motivational shift from have-to to want-to goals is not like a binary switch (Milyavskaya & Inzlicht, 2017). Research has indicated that there is a positive linear relationship between individuals’ want-to motivation and the length of time they are denied their want-to goals, such that the longer people are unable to do what they want, the higher they rate their desire to engage in activities that provide them with personal enjoyment (Wascher et al., 2014). For example, air traffic controllers, who receive a fixed incentive for exerting self-control, will ultimately shift their motivation to immediately gratifying want-to goals, even if they are persisting towards the most important have-to goals (Milyavskaya & Inzlicht, 2017). Second, attentional shifts can drive one’s motivation away from extrinsically appealing rewards. A person will become less attentive to exerting self-control on a task, even if external factors (e.g., money) continue to be increased, particularly because they are attending more to their want-to motivations (which provide greater intrinsic gratification). Although some researchers have examined autonomous (want-to) motivation as the other side of a continuum from controlled (have-to) motivation (Sheldon & Houser-Marko, 2001), researchers have recently suggested that these two motivations are two distinct dimensions. A meta-analysis showed that want-to and have-to
motivations were minimally correlated ($r = -.2$), and that goal progress was only significantly related with want-to motivation (Koestner, Otis, Powers, & Pelletier, & Gagnon, 2008). These results show that these dimensions can work independently of one another, and that the individual’s sense of want-to versus have-to motivation on a task can be indicative of their self-control exertion towards goal attainment. The present study empirically assesses changes in self-reported have-to motivations on-task and want-to motivations off-task, in order to examine the recently proposed shifting priorities model.

**Chapter 5: Work Ethic Behaviors**

Over a century ago, the theoretical foundation on work ethic was set with the origination of Protestant Work Ethic (PWE) by Weber in the early 1900’s. By 1958, Weber had defined PWE as a “calling to work” established through one’s personal conduct exemplified by self-discipline, hard work, frugality, asceticism, delay of gratification, and conservation of resources (Miller, Woehr, & Hudspeth, 2002). A focal point of Weber’s beliefs was that delay of gratification acts as the critical foundation for the development of personal determination, strong work ethic, and hard work (Miller et al., 2002). The concept of PWE proposed that these desirable behaviors were demonstrated through hard work and rejection of leisure.

Nowadays, the religious term, ‘Protestant’, has been dropped and the more secular concept of “work ethic” has replaced the original terminology. However, the modern term still borrows from the original conceptualization, specifically regarding the notion of meaningful effort exertion and restraining from leisurely behaviors. The construct of work ethic is a “motivational construct reflected in behavior” (Miller et al., 2002). The concept of work ethic is derived from a combination of “work-related ideals in the form of values
about what is *good* and norms about what *ought to be* concerning the person’s orientation toward work” (Mann, 2010). Research has indicated that work ethic likely stems from childhood development, cultural influences, early work experiences, and critical events during one’s life span (Wood, 2016). Based on Bandura’s (1985) social learning theory, work ethic can be developed and reinforced (through positive or negative experiences); therefore, it is a learned behavior.

The concept of work ethic has been applied in the context of selecting employees who can drive organizational outcomes (Ruebusch, 2003). Additionally, organizations have developed work ethic training workshops in an attempt to improve workplace productivity (Cardenas, 2003). In earlier research findings, survey results from 150 supervisors in the US indicated that 60% ranked work ethic as the most important selection factor (Flynn, 1994). Thus, this concept remains important and of interest to modern-day practitioners. Another reason to focus on this concept is that work ethic has connections with a vast nomological network of social, psychological, and organizational variables.

The theory underlying work ethic emerges from research in development psychology, education, business management, economics, and organizational psychology; thus, it transcends any single discipline.

Although work ethic is often seen as a single construct, researchers have studied the structure of multiple work ethic measures and have identified several distinct dimensions (Furnham, 1990; McHoskey, 1994; Tang, 1993). In the early 2000’s, Miller and colleagues began to review the literature on work ethic and address the important validity gaps. In an effort to improve criterion-related and construct-related validity for work ethic, the researchers developed the Multidimensional Work Ethic Profile (MWEP).
The seven distinct dimensions referred to in the measurement tool are: 1) centrality of work, 2) delay of gratification, 3) hard work, 4) morality/ethics, 5) self-reliance, 6) wasted time, and 7) leisure. Each of these dimensions influence how an individual interprets situations in the workplace and may impact their behaviors while on the job. The characteristics for the concept of work ethic were specified by Miller et al. (2002) as:

(a) is multidimensional; (b) pertains to work and work-related activity in general, not specific to any particular job (yet may generalize to domains other than work—school, hobbies, etc.); (c) is learned; (d) refers to attitudes and beliefs (not necessarily behavior); (e) is a motivational construct reflected in behavior; and (e) is secular, not necessarily tied to any one set of religious beliefs. (p. 5)

In the MWEP, centrality of work refers to the valence towards the act of working, simply for the sake of putting forth effort. Delay of gratification in the MWEP is characterized by postponing rewards and persisting with effort. The dimension of hard work focuses on the increased effort levels required to perform successfully. The morality/ethics dimension emphasizes the role of honest principles and moral behaviors. Self-reliance is characterized by a tendency towards independence and not relying on others. For the final two dimensions, the terms appear to be contradictory to the concept of work ethic; thus, high levels in the following dimensions can be indicative of low work ethic. The dimension of wasted time is defined as being inefficient and not using time strategically. Lastly, leisure focuses on one’s tendency to relax and oppose continuous effort exertion. These work ethic dimensions relate differently with key organizational outcomes. For instance, hard work and delay of gratification have positive relationships with job satisfaction, organizational citizenship behaviors, and commitment (Meriac, 2012; Ryan, 2002). Furthermore, job
performance has been shown to be significantly predicted by delay of gratification (Miller et al., 2002). On the other hand, individuals who value leisure and tend to waste time are more likely to have lower levels of outcomes like job satisfaction, organizational citizenship behaviors, and commitment (Meriac, 2012). Moreover, self-reliance has been shown to positively relate to job performance, but negatively relate to organizational citizenship behaviors (Meriac, 2012).

Research has suggested that these multiple work ethic facets are polar opposites: work (labor) or non-work (leisure; Beatty & Torbert, 2003). Beatty and Torbert (2003) stated, “What is work cannot be leisure, and what is leisure cannot be work” (p. 239). Essentially, the time and effort put forth towards work is time and effort that is not put towards leisure, vice versa. Those who engage in labor-related behaviors are likely to spend greater amount of time on their tasks, whereas those individuals who engage in leisure-related behaviors will be indulging in off-task impulses and therefore will likely spend less time on-task (Inzlicht & Schmeichel, 2014). Leisure-type work ethic has been operationalized as the amount of time spent not performing work tasks, also explained as tendency towards being off-task (Beatty & Torbert, 2003). However, research has challenged the duality notion that labor and leisure are independent of one another, instead suggesting that psychological phenomena like ‘flow’ in the workplace are prevalent due to simultaneous presence of labor and leisure behaviors (Beatty & Torbert, 2003; Csikszentmihalyi, 1990). Therefore, while not independent of one another, time spent on-and off-task can be indicative of one’s proportion of labor and leisure work ethic behaviors, respectively. Interestingly, the time on task reasoning has been mainly used as post-hoc explanations for self-control studies that have shown performance decrements (Arber et
Shifting motivational priorities (al., 2017). In sum, it is apparent that the labor-oriented work ethic dimensions share a positive relationship with desirable work objectives, while leisure-oriented work ethic dimensions are negatively related to desirable work goals. The current study aims to focus on the labor-oriented and leisure-oriented behaviors encompassed by these dimensions.

Overall, work ethic has been shown to be an important predictor for performance outcomes. Researchers have demonstrated that the construct of work ethic is significantly different from general intelligence, job involvement, task performance, and work commitment (Miller et al., 2002). Furthermore, the literature suggests that motivation and work ethic are related, such that work ethic is predictive of participants’ task persistence and quantity of tasks completed (Merrens & Garrett, 1975). Previous findings also demonstrate that the stronger one’s work ethic is the more likely that person is to select a more challenging task, even when given easier alternative task options (Parkhurst, Fleisher, Skinner, Woehr, & Hawthorne-Embree, 2011).

It is important to continue to research the work ethic and performance relationship because some of the empirical studies appear to have substantial limitations. For example, Ganster (1981) was unable to replicate a couple lab studies by Greenburg (1977) and Tang (1990). Additionally, data gathered from organizational field studies were collected through a subjective, self-report performance measure ratings (Ntayi, 2005). Also, another empirical study regarding the work ethic and performance relationship had a strong negative skew for the supervisor ratings for performance. The literature has called for a better understanding and more empirical research on work ethic, such as key antecedents and work outcomes associated with the phenomena (Cherrington, Condie, & England, 1979), but the subsequent four decades have resulted in relatively few empirical findings.
In general, previous research findings highlight that work ethic can be a useful predictive measure in the organizational context, but to bridge the gap more empirical research needs to be conducted to objectively demonstrate the important relationships. Therefore, the current study evaluates time-based work ethic behaviors as direct outcomes of the self-control exertion process. More specifically, in the shifting priorities model, the refractory period (during which self-control exertion decreases) is proposed to favor leisurely behaviors; therefore, this study examines whether the dip in self-control is predictive of a decrease in labor-type work ethic behaviors (operationalized as time spent on the task) and an increase in leisure-type work ethic behaviors (operationalized as time spent off the task).

**Chapter 6: Task Performance**

In the field of industrial-organizational psychology, the construct of job performance has remained a focal point (Austin & Villanova, 1992; Campbell, 1990; Murphy & Cleveland, 1995). Many job performance models have been postulated over the years (e.g., Campbell, 1990; Borman & Motowidlo, 1993; Organ, 1994; Viswesvaran, & Ones, 2000). These theories typically indicate three overarching dimensions: task performance, organizational citizenship behaviors, and counterproductive work behaviors. The current study aims to focus only on the task performance dimension of job performance, which is often a primary focus of the organization’s performance appraisals, promotion opportunities, and hiring decisions (Murphy & Cleveland, 1995).

Initially, the exploration of the job performance construct concentrated mainly on the task requirements. Previously, scholars attempted to create a human performance taxonomy based on training theories and learning techniques (Fleishman, 1967; Guilford, 1954). The researchers aimed to develop task clusters that were homogenous and could be
applied across jobs. The four approaches for identifying task performance dimensions that Fleishman (1975) highlighted were: behavior requirements approach, task characteristics approach, behavior description approach, and abilities approach.

Currently, organizational research defines task performance as “the proficiency with which incumbents perform activities that are formally recognized as part of their jobs, activities that contribute to the organization’s technical core either directly by implementing a part of its technological process, or indirectly by providing it with needed materials or services” (Borman & Motowidlo, 1993, p. 73). Task performance involves accomplishing tasks and duties that are indicated in the job description. The tasks entail fundamental responsibilities that define the role of the employee, and the employees perform these tasks in order to receive their compensation (Rousseau & Parks, 1993). How well an employee performs their in-role tasks often determines important outcomes such as pay increases and promotions.

Researchers have focused on the predictors and dimensions of task performance. For instance, evidence shows that task performance is predicted by individual differences in conscientiousness, general cognitive ability, job-specific skills, and work experience (Campbell, 1990; Hattrup, O’Connell, & Wingate, 1998; Gellatly & Irving, 2001). One previous study found that implicit motivation significantly predicted task performance (Brunstein & Maier, 2005); however, motivation has been indicated as an understudied predictor of task performance (Ziegler, Schmukle, & Egloff, 2010). Additionally, in the area of self-control research, task performance has been measured as an indirect assessment of individuals’ self-control depletion levels (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Muraven, Collins, & Nienhaus, 2002; Muraven, Tice, & Baumeister, 1998; Vohs &
Shifting motivational priorities

Heatherton, 2000). In the current study, the process of self-control was measured separately from objective task performance in an attempt to clarify previous empirical results. More importantly, this study aims to focus on how individual’s task performance outcomes are influenced by the direct antecedents of work-related behaviors of time spent on- and off-task as well as the distal self-control exertion predictors.

Chapter 7: The Current Study

This dissertation integrates foundational research on regulatory constructs like delay of gratification and time perspective into the recently proposed (non-resource dependent) motivational mechanism of self-control. Also, this study incorporates the recent theoretical propositions on the shifting priorities model of self-control by empirically testing their hypothesis regarding key motivational shifts that underlie self-control failure or success. The present study expands the theoretical perspective of the motivational mechanism of self-control by evaluating shifts in have-to and want-to motivation throughout the action phases of task completion described in the Rubicon model. Leveraging the consistent findings in choice-based motivation theories, this paper proposes a more specific underlying process of self-control. Particularly, the present study hypothesizes that individuals initiate and continue goal-directed actions through subjective cognitive choices considering how motivated they feel about whether they want-to versus have-to engage (and persist) in an action. Thus, this study proposes that there is a direct influence on important work ethic behaviors, and ultimately on task performance, depending on the person’s motivation levels and their respective self-control exertion throughout goal pursuit.
Importantly, this study aims to clarify mixed results in the current literature and to extend the shifting priorities theory by providing an empirical evaluation of the motivational shifts that act as an underlying mechanism of self-control as proposed by Inzlicht and colleagues. Also, this study examines the tendency to delay gratification from an organizational behavior perspective with an adult population, which is particularly important since this construct has mainly been evaluated in children. Additionally, the present study aims to integrate the Rubicon model of action phases to evaluate the four successive, dependent phases throughout a comprehensive time frame. Interestingly, most studies have taken the between-persons & between-phases approach in assessing the Rubicon phases of action, even though the phases are supposed to highlight distinct phases towards 1 action or planned behavior. In an effort to assess each phase, previous research has over-operationalized these action phases and has separated these distinct phases and tested them independent of one another (Vohs, Baumeister, Schmeichel, Twenge, Nelson, & Tice, 2014). From a holistic perspective, it would be beneficial to examine the within-person and between-persons differences over time regarding the fluctuations in motivational choices throughout one action or many continuous actions.

Also, this dissertation aims to highlight the role of self-control in the workplace by assessing work ethic behaviors as a central outcome. Specifically, the direction and intensity of the shifts in competing motivations towards on-task behaviors during goal pursuit is proposed to mediate the relationship between one’s likelihood to delay gratification and engaging in labor- versus leisure-related work ethic behaviors. Additionally, previous researchers have studied self-control success and failure implicitly through performance on a task. Nonetheless, the assumptions at the core of self-control
studies using the methodologies outlined by the limited resource model fail to explicitly assess self-control and its outcomes independent of one another. Therefore, the present study evaluates the impact of self-control on task performance throughout the dynamic motivational shifts that occur during the multiple action phases of goal achievement. The primary goal of this dissertation is to advance this research domain while connecting it to an audience of organizational scholars. This connection needs to be strengthened because the psychological experience of self-control is central to the study of on-task performance in organizations. By fostering this connection, this study aims to extend recent theoretical propositions around the concept of self-control in the workplace. Furthermore, the objective of this paper is to examine organizational behavior related to self-control, using advanced methods and techniques of manipulation and measurement. The present dissertation model is depicted below.

*Figure 1. Theoretical Model*
Chapter 8: Hypotheses

This study evaluates the underlying motivational shifts in priorities that occur during the self-control process. Additionally, the current study examines the main effect for delay of gratification and its interaction effect with time perspective on motivation shifts while performing an effortful task. Furthermore, this study explicitly evaluates important outcomes of the self-control process, such as labor versus leisure work ethic behaviors and objective task performance.

Shifts in motivation during self-control process

The value of exerting self-control over time has been suggested to shift based on a person’s motivational, emotional, and attentional processes (Milyavskaya & Inzlicht, 2017). The current study focuses only on the motivational process underlying self-control functions. Specifically, shifts in motivation can be explained by “situational and temporal changes in the subjective values of each option” (Milyavskaya & Inzlicht, 2017, p. 8). Motivational shifts are suggested to drive factors like attention, perception, and memory (Inzlicht & Berkman, 2015). Therefore, these shifts in the individual’s motivation (and his/her respective attention, perception, memory, etc.) can subsequently influence one’s subjective valuation process. The fluctuations in an individual’s subjective value of have-to motivation and want-to motivation have been proposed to drive the self-control process (Francis & Inzlicht, 2016; Robinson, et al., 2010). Furthermore, the shifting priorities model proposes that the refractory period for self-control “is the product of an imbalance between motivational needs for exploration, leisure, and ‘want-to’ goals after having exerted effort on exploitation, labor, and ‘have-to’ goals” (Inzlicht, et al., 2014, p. 129). This refractory period thus involves effortful inhibition being undermined by a personal
Shifting motivational priorities

drive to activate want-to off-task goals, ultimately resulting in self-control failure. Therefore, this study predicts that the self-control exertion process involves a negative shift in have-to on-task motivation and positive shift in want-to off-task motivation.

_Hypothesis 1A_: The slope for have-to motivation over time directed on-task will be negative.

_Hypothesis 1B_: The slope for want-to motivation over time directed off-task will be positive.

_Self-control process predicted by delay of gratification_

Typically, tasks are seen as effortful and depleting when they require exertion of executive functions (prolonged attention or inhibition) for an extended period and are not seen as immediately rewarding (Ryan & Deci, 2000). Recent research has shown that as an effortful task is performed, “motivation and attention shift so that reward-related neural areas are additionally activated and control-related areas are less responsive” (Francis & Inzlicht, 2016). The current study suggests that it is likely that a person’s tendency towards delaying gratification influences the expected duration for receipt of reward, which extends the amount of time and effort put towards an effortful activity. Therefore, this dissertation proposes that one’s trait delay of gratification is a key predictor in the shifting priorities self-control process model.

_Hypothesis 2A_: Delay of gratification will predict the slope for have-to motivation directed on the task: higher delay of gratification will be associated with weaker negative slopes.
Shifting motivational priorities

*Hypothesis 2B:* Delay of gratification will predict the slope for want-to motivation directed off the task: higher delay of gratification will be associated with weaker positive slopes.

*Self-control process predicted by time perspective*

Although research highlights that self-control and time perspective are important correlates (Watson & Milfont, 2017), whether future time perspective can explain the self-control exertion process remains unclear. Previous research has identified key relationships between future time perspective and physiological fluctuations (variability in heart rate and salivary cortisol changes) associated with effortful exertion (Milfont & Schwarzenthal, 2014; Lens, Paixao, Herrera, & Grobler, 2012; Watson, 2015). In addition, those with lower consideration towards future consequences have been suggested to engage in riskier behaviors, a common indication of lower levels of self-control (Joireman, Balliet, Sprott, Spangenberg, & Schultz, 2008). This study suggests that those with high levels of future time perspective are likely to experience less intense motivational shifts towards non-depleting activities over time because their consideration of future goals is more evident.

*Hypothesis 3A:* Future time perspective will predict the slope for have-to motivation directed on the task: higher future time perspective will be associated with weaker negative slopes.

*Hypothesis 3B:* Future time perspective will predict the slope for want-to motivation directed off the task: higher future time perspective will be associated with weaker positive slopes.

*Interaction of time perspective and delay of gratification on self-control process*
The delay of gratification studies, examining children overcoming their desire to immediately gulp that fluffy marshmallow, were centrally based on the concept of time and waiting. Time plays a key role in the refractory period of self-control as proposed by the shifting priorities model. Previously, many limited resource model studies examined the depletion of self-control resources over time, specifically examining task performance degradation throughout a series of tasks that require executive control. Recently, the newest self-control process model (shifting priorities) proposed that change in one’s motivation over time is a primary contribution to subsequent self-control failure following initial exertion. One psychological construct that stands out in this context is time perspective, which specifically focuses on an individual’s subjective perception of time in the past, present, and future. This suggests that examining the impact of delay of gratification or time perspective alone is simply not enough; the shared underlying role of both constructs could have important implications for the self-control exertion process. Therefore, it is important to highlight that the present study is examining the interaction of these interrelated constructs.

Moreover, research has not examined the role of time perspective and its direct influence on the self-control process. Although research on both constructs began many decades ago, the first examination of the interrelationships between trait self-control, delay of gratification, and consideration of immediate and future consequences (time perspective) was published just recently (Watson & Milfont, 2017). That study found significant relationships across all the variables and across longitudinal time points. Specifically, Watson and Milfont (2017) found that delay of gratification and future time perspective had a significant positive relationship ($r = .48, p < .001$) with one another at
the first time point. Additionally, delay of gratification at Time 1 was found to significantly predict future time perspective at Time 2 ($B = .14, p < .05$). However, previous research does not appear to have examined the potential interactive effects of these characteristics (Watson, 2015; Watson & Milfont, 2017). To investigate this issue, the current study predicts that dispositional delay of gratification and time perspective interact together to determine how individuals manage have-to and want-to motivations during the process of self-control to avoid succumbing to immediate desires at the expense of long-term interests. For instance, delay of gratification may help self-control exertion by weakening the negative slope for have-to motivation over time. However, that effect may be amplified with the inclusion of high future time perspective because not only is the individual likely to value later reward (high delay of gratification), he/she will also tend to focus on future outcomes more (high future time perspective). On the other hand, this delay-slope effect may be less pronounced for those with low future time perspective because the individual may value a delayed reward but lacks a strong prospective focus needed in order to persist.

*Hypothesis 4A:* Future time perspective will moderate the relationship between delay of gratification and slope for have-to on-task motivation such that this negative relationship will be stronger when future time perspective is higher.

*Hypothesis 4B:* Future time perspective will moderate the relationship between delay of gratification and slope for want-to off-task motivation such that this negative relationship will be stronger when future time perspective is higher.

*Self-control process results in work ethic behaviors*

“Work was the anvil upon which self-discipline was forged” (Rodgers, 2014, p. 99). In explaining the development of work ethic in America, self-control is described as
the foundation for success. With delay of gratification as an underlying core dimension of the work ethic construct, it was clear that these variables are interrelated. Moreover, self-control measures typically have a facet for work ethic (Tangney et al., 2004) and the work ethic measures have a self-control facet (Miller et al., 2002); this overlap indicates the inherent influence that these variables have on each other. The self-control process is suggested to shift personal priorities resulting in behaviors that can be characterized as labor-related or leisure-related. Labor is essentially operationalized as the input of time and effort, while leisure is the time spent away from performing that labor (Haworth & Veal, 2004). Objectively, more time spent on-task indicates greater labor-related work ethic, and more time spent off-task is indicative of greater leisure-related work ethic. For centuries, scholars have separately highlighted the important roles of both self-control and work ethic constructs for developing and maintaining a successful working population; however, there has been a lack of research assessing the impact that these variables have on one another. One notable study was recently conducted to assess whether work ethic values predict ego depletion (diminished self-control resources); however, neither delay of gratification nor leisure-related work ethic behaviors significantly predicted the depletion effect (Bazzy, 2016). However, the concepts and procedures used in that study have since been called into question, along with all other invalid depletion tasks (Lurquin et al., 2016; Lurquin & Miyake, 2017). Therefore, the current study aims to reevaluate the relationship between these variables by specifically examining how delay of gratification predicts the self-control process, which ultimately is believed to influence work ethic behaviors.

Based on the recent shifting priorities model, decrements in one’s self-control over time (known as the refractory period following exertion in a depletion task) is a result of
Shifting motivational priorities

an unbalanced drive towards want-to and have-to goals (Inzlicht et al., 2014). Interestingly, the broad work ethic characteristics of labor and leisure are believed to play a major role in the instinctual pressures of the self-control process. This recent theoretical model indicates that one’s ultimate failure of self-control is compelled from an evolutionary drive to achieve balance in resource exploitation (labor) and resource exploration (leisure); therefore, a trade-off begins once an individual feels they have exerted effort and exploited sufficient resources. Previous literature has identified a few objective indications of strong labor-based work ethic behaviors: time spent on task, task initiation and diligent completion, and persisting until the task is completed (Porter, 2004). Conversely, leisure-related work ethic behaviors refer to objective time spent off a task, procrastinating with task initiation, wasting time, and taking recovery task breaks (Miller et al., 2002; Porter, 2004). The current study suggests that the self-control process influences one’s behavioral outcomes, specifically the time spent exerting effort on a task (a labor-related work ethic behavior), and correspondingly the time spent off a task (a leisure-related work ethic behavior). This study suggests that following initial self-control exertion an individual’s have-to motivation directed on to the task begins to decrease over time, resulting in the individual feeling less like they ought to continue exerting effort. Therefore, the individual is likely to end up engaging in fewer labor-related behaviors (i.e., time spent on task) in order to limit energy exploitation. Simultaneously, as time on-task decreases, time off-task will increase, highlighting an increase in leisure-related behavior likely due to an increase in want-to motivation directed off a task.

*Hypothesis 5A*: There will be a positive within-person relationship between have-to motivation and time spent on-task (labor).
Shifting motivational priorities

Hypothesis 5B: There will be a positive within-person relationship between want-to motivation and time spent off-task (leisure).

Work ethic behaviors influence task performance

The positive relationship between work ethic and work performance has been sufficiently researched (Meriac, Woehr, Gorman, & Thomas, 2013; Van Ness, Melinsky, Buff, & Seifert, 2010). Scholars have found that strong work ethic is related to higher motivation and involvement in work tasks (Meriac, 2015), and the greater one’s attention towards a task the more likely he/she is to perform better (Kanfer, Ackerman, Murtha, & Dugdale, 1994). Moreover, one previous study highlighted that self-reported work ethic significantly predicted salesforce task performance ($B = .157, p < .01$; Ntayi, 2005). Work is typically perceived as aversive, and it has been suggested that over time “more behavior will be allocated toward less effortful alternatives (e.g., engaging in off-task behavior)” (Reed & Martens, 2008, p. 50). Therefore, one’s tendency towards persistently exerting effort on-task (work ethic), can be influential to how an individual performs on a task (task performance). Additionally, research has examined the influence on task performance based on the amount of time spent attending to the task. Specifically, researchers have previously found that those with high ego depletion levels often invest less time on-task and express lower stamina levels (Muraven & Baumeister, 2000; Muraven, Tice, & Baumeister, 1998). Additionally, it has been suggested that trait self-control should be positively related to a test taker’s time-on-task and performance (Schmeichel & Zell, 2007). Based on previous research regarding attention and time spent on-task (Bazzy, 2016), it is proposed that those who spend more time on-task are exhibiting labor-related work ethic behavior and those behaviors are related to higher task performance levels.
Shifting motivational priorities

Additionally, this study proposes that spending time off-task (which indicates leisure-related work ethic behavior) negatively impacts one’s task performance.

*Hypothesis 6*: Time spent on-task (labor-related work ethic behavior) will positively predict task performance.

**Method**

*Overview*

This study assesses shifts in motivation while performing a validated cognitively effortful task in an online workplace simulation experiment. The current study also examines delay of gratification and time perspective as antecedents to explain differences in motivational shifts during the self-control exertion process. Furthermore, the present dissertation also evaluates the influence of the motivational shifts on objectively measured labor and leisure work ethic behaviors and relates those tendencies to calculated task performance outcomes.

Recent studies have emphasized the need to select valid tasks in self-control research; therefore, the current study is using the recently validated letter-crossing task (Arber et al., 2017). In the online simulation, the participants were asked to work on this task for 45 minutes, during which they were asked to rate their want-to and have-to motivation levels. An important aspect integrated into the present study is the option to engage in off-task behaviors, similar to a workplace setting where employees make choices to engage in leisurely behaviors (e.g., read the news, scroll through social media, play games). This simulation provides alternative off-task options that require little to no effort exertion (reading electronic magazine articles of personal interest). Participants
have free choice to engage in the off-task activities; however, they were notified that only their performance on the letter-crossing task will be evaluated.

Participants

The participants in the current study were recruited through Amazon’s Mechanical Turk (MTurk) website. Previous research has suggested this is a useful source of research participants (Goodman, Cryder, & Cheema, 2013; Buhrmester, Kwang, & Gosling, 2011). The website functions via a requester who publishes a Human Intelligence Task (HIT), and then workers (the online participants) complete the published task. The current study restricts the participants, referred to as workers by MTurk, to only those residing in the United States. Consistent with preliminary estimations on g*Power software, the current study targeted approximately 225 total participants as a sufficient sample size to obtain an appropriate medium estimated effect size for the interaction effect. Each participant who completed the online experiment through Mturk were paid $4.00 based on the general recommendation for paying MTurk workers (Ross, Irani, Silberman, Zaldivar, & Tomlinson, 2010; Buhrmester, et al., 2011). Additionally, in the simulation instructions, there was explicit explanation that an incentive ($20 Amazon Gift Card) will be provided for the top 10% of performers.

The initial sample consisted of 377 participants; however, after cleaning and screening the data for completion (described later in full detail), the final sample consisted of 325 individuals who participated in both the survey and simulation portions of the study. The age range of participants was reported mostly between 25 and 34 years old \(N = 192, 59\%\) or greater than 45 years old \(N = 104, 32\%\). The majority of the sample was comprised of women \(N = 182, 56\%\). Also, the major ethnicity of the sample
Shifting motivational priorities

was Caucasian \((N = 230, 71\%)\), followed by African Americans \((N = 52, 16\%)\). Most participants indicated having a bachelor’s degree \((N = 224, 69\%)\) or a high school diploma \((N = 75, 23\%)\). The majority of the participants indicated working more than 30 hours per week \((N = 189, 58\%)\). Most of the participants have had at least two to four years of work experience \((N = 208, 64\%)\) as an entry level manager \((N = 139, 43\%)\) or mid-level manager \((N = 72, 22\%)\). Additionally, participants indicated that they were very proficient \((N = 290, 89\%)\) in working on computer-based tasks. Refer to Table 1 for a complete list of demographic information.

**Measures**

Appendix B provides a complete list of all the measures included in this study.

*Delay of Gratification.* The scale used in this study was adapted from the validated Delaying Gratification Inventory (Hoerger, Quirk, & Weed, 2011). According to previous research, this scale has strong internal consistency \((\alpha = .88)\) and test-retest reliabilities \((r_{\text{retest}} = .88; \text{Hoerger et al., 2011})\). Additionally, a confirmatory factor analysis on the delay of gratification scale has indicated a good fit for the overall model \((\text{CFI}=.964, \text{RMSEA}=.057, \chi^2/df=32.49; \text{Hoerger et al., 2011})\). Participants were asked to indicate to what extent they agree that their personal tendencies are reflected in the measurement statements. Responses were provided on a five-point Likert scale \((1=\text{Strongly Disagree}; 3=\text{Neither Agree nor Disagree}; 5=\text{Strongly Agree})\). An example item from the delay of gratification scale is: “Even if I am hungry, I can wait until it is meal time before eating something.”

*Time Perspective.* The Zimbardo Time Perspective Inventory (1999) was used to evaluate the participant’s future time perspective. Previous research has indicated strong
internal consistency for future time perspective ($\alpha = .83$; Anagnostopolous & Griva, 2012). However, validation efforts that have examined the entire multi-factor model (past, present, and future) have indicated poor fit results ($\text{CFI}=.636$, $\text{RMSEA}=.055$, $\chi^2/df=3.27$; Worrell & Mello, 2007). However, the present study is only interested in the future orientation subscale. Participants were asked to indicate how true the statements are in regards to their personal characteristics. Responses were provided on a five-point scale (1= Very Untrue; 3= Neutral; 5=Very True). A sample item from the future time perspective scale is: “I keep working at difficult, uninteresting tasks if they will help me get ahead.”

Motivational Priorities. Motivational priorities were evaluated multiple times throughout the duration of the online workstation simulation. In the online simulation, the participants are directed to work on a letter-crossing task where they are required to complete as many of these tasks as accurately as possible until their 45-minute shift is over. Throughout the duration of each task, the participant was probed to respond to questions regarding how strongly they feel that they have to perform the task and how strongly they feel that they want to do something other than that task. Specifically, the single-item used to probe have-to motivation on a task is: “At this moment, I feel like I personally have to do the letter-crossing activity.” The single-item used to probe want-to motivation off a task is: “At this moment, I feel like I personally want to do anything other than the letter-crossing task.” Consistent with the multiple action phases of the Rubicon model, the current study asked the have-to and want-to motivation questions several times throughout the 45-minute simulation. Specifically, the two questions were asked in 3-minute increments – for a total of 15 times. It is important to note that the
Shifting motivational priorities

slope values discussed in the remainder of this dissertation were calculated based on change in motivation levels for every three minutes on the simulation.

*Work Ethic Behaviors.* In an effort to objectively measure work ethic behaviors, the current study operationalized tendencies toward labor and leisure by calculating the time directed towards on-task and off-task efforts in the backend of the simulation. The labor-related behavior was measured by the amount of time the individual spent on the letter-crossing task (time on-task). Additionally, the leisure-related work ethic behavior was measured by the amount of time spent off the task. For measuring the length of time that participants engaged in off-task activities, it was essential to consider both the amount of time spent (a) actively engaging in the off-task option within the simulation and (b) inactive within the simulation. The active off-task option was provided in the corner of the simulation screen, which consisted of a newsfeed application. This newsfeed was available if the participant chose to engage in a less depleting task at any point throughout the letter crossing activity. If the individual decided to go off-task, he/she had the option to choose an internet magazine article (including topics like sports, business, and entertainment) to read depending on his/her personal interests. Although this option may not be the most compelling activity, it is far less depleting and far more desirable to perform than the crossing letter task, and therefore represents a non-depleting (recovery) activity. Additionally, inactive off-task behavior was coded using idle computer activity time. Throughout the entire simulation, all mouse and keyboard movements were tracked, and the idle timer began when there was a period of 10 seconds without any mouse movement. The letter-crossing task requires relatively consistent letter-clicking through the duration of the study; therefore, a participant’s lack of mouse
Shifting motivational priorities

or keyboard functions was indicative of off-task behaviors. It is suggested that time spent on the task represents hard work (labor), whereas time spent off the task represents a desire to exert less effort (leisure). During each 3-minute increment following the motivational question probes, the simulation is coded to capture the amount of time spent on the letter-crossing task and the amount of time spent on the alternative off-task behaviors.

*Task Performance.* A recently validated depletion task, a letter-crossing activity, was selected for participants to perform (Arber et al., 2017). For this task, the participants are required to scan a series of text prompts throughout the 45-minute simulation and indicate which words contain a target letter (typically the letter “e”) and meet a set of specific conditions (i.e., select only if a vowel is next to the target letter). Incorrect responses are not deducted from the calculated score, so participants are encouraged to work diligently to identify correct responses. The number of targets that are correctly selected by the participant was divided over the total number of targets attempted to calculate the ratio of accurate responses, then those values were standardized to represent the individual’s overall task performance.

*Attention Checks.* The respondents were asked to respond to attention check questions randomly dispersed throughout the survey. The following four attention check items were taken from Meade and Craig (2012): (a) I carefully read every survey item. (b) I could’ve paid closer attention to the items than I did. (c) I probably should have been more careful during this survey. (d) I worked to the best of my abilities in this study. Participants were asked to indicate how true the statements were regarding their
Shifting motivational priorities

participation in the study. Responses were provided on a five-point scale (1 = Very Untrue; 3 = Neutral; 5 = Very True).

Demographics. The respondents were asked to provide their gender, age, education level, and work background information in the survey.

Design & Procedure

The purpose of the study was explained to the participants as an examination of people’s preferences in the workplace. Participants were asked to provide their informed consent prior to participation in the study (see Appendix A). Following their responses to the trait surveys, the participants were provided a link to enter their online workstation with a full set of instructions on the simulation’s required task and alternative (non-required/non-depleting) tasks. The simulation began once the participant clicked the link to enter the workstation. Once the simulation has begun, the purpose-built program initiates a screen lock down that does not allow the participants to minimize the simulation window. If the participant chooses to minimize or exit the simulation at any point, a pop-up message appears, notifying the participant that the simulation will terminate and they will be removed from further participation without receiving credit for the study. The computer environment was setup to reflect an individual initiating a session-based task that was previously assigned to them with an alternative off-task option. There is some flexibility in what the participant chooses to do and how persistently he/she chooses to perform the required task. For example, the mandatory letter-crossing task opens immediately upon entering the simulation; however, the non-depleting alternative (newsfeed) on the side of the screen is available throughout the entire simulation. These types of activities are often available for employees to access
Shifting motivational priorities

and switch between when working on the job; therefore, the participants are provided
with some autonomy in terms of working on the mandatory task. For example, one
participant may initiate the simulation and exert effort only on the mandatory letter-
crossing task for the entire duration, whereas another participant may work on the letter-
crossing task for only a portion of time before engaging in the off-task activity. For future
reference and objective coding, each participant’s screen was recorded throughout the
entire simulation. From the beginning of the simulation, the have-to and want-to
motivation probes appeared every three minutes (a total of 15 times throughout the
simulation). After the 45-minute timeframe, the participant was immediately notified that
the simulation was completed and he/she was provided with an authorization code to
enter into MTurk. This code was matched to subsequently compensate the participants
($4.00/study) who successfully completed both the survey and simulation portions.

Pilot Study

A pilot study was conducted to evaluate the general functions of the simulation
and to examine the length of time most appropriate for the Letter-Crossing Task. The
purpose of the pilot study was to assess the effectiveness of the on- and off-task activities
in the electronic workspace. A total of 17 graduate students completed this pilot study.
Participants were asked to complete the entire study (survey and simulation portions).
The attention check questions were evaluated, and it was determined that all respondents
accurately answered all four items. The purpose of the attention check items was to
ensure that respondents carefully read and responded to the material. Following
completion of the study, the pilot participants were asked to respond to a series of
questions to provide feedback on the entire study. Based on the outcome of the pilot
study, minor changes were made (i.e., corrected typos, clarified simulation instructions).
The pilot study results suggested that the simulation functioned smoothly, the attention
check items were useful, and the aversiveness of the required task was appropriate in
comparison to the off-task option. Additionally, the pilot study aided in determining the
best length of time required for the Letter-Crossing Task. The respondents identified that
45 minutes was lengthy enough to describe the simulation task as aversive. Lastly,
choosing from a payment range of $2.00 to $6.00, the majority of pilot study participants
indicated that $4.00 is sufficient to pay each study participant.

Results

Preliminary Analyses

Prior to data analysis, the data were prepared by going through an extensive
process to preserve the appropriate information necessary to evaluate the hypotheses.
First, the survey data were merged with the simulation data based on the participant’s
session number. Next, the merged data were cleaned, which required deletion of cases
that had incomplete data with more than 25% missing data points and/or insufficient
level-2 data. A total of 33 incomplete cases were withdrawn from the dataset. Then, the
data were evaluated for any univariate outliers by converting raw scores into z-scores.
Any standardized value that exceeded an absolute score of 3.29 was identified as an
outlier and removed (Tabachnick & Fidell, 2007). Only two univariate outliers were
identified and removed. Similar to the pilot study, attention check questions were
evaluated to ensure that participants were directing their attention towards the study.
Regarding the four attention check items, about 62% of participants accurately responded
Shifting motivational priorities
to the first question, 95% of participants accurately responded to the second question, 75% of participants accurately responded to the third question, and 90% of participants accurately responded to the fourth question. A total of 17 cases with two or more incorrect attention check responses were removed from the dataset. Overall, the results indicated that the majority of participants remained attentive throughout the study. After screening and cleaning the data, the final sample size was 325 participants.

Following preparation of the data, reverse coding was carried out for necessary items, and then the relevant items were transformed into key variables. The skewness and kurtosis were examined to identify the degree of normality and symmetry of the data. None of the skewness values were greater than an absolute value of 1.40, which is below the 2.0 value indicated by Curran, West, and Finch (1996) for potential non-normality of data. Therefore, the following analyses met the data normality assumption.

To evaluate scale quality, the internal consistency reliability of each scale was examined. The quality of each measure was assessed before examining the hypotheses, and the results indicated that both scales (delay of gratification and future time perspective) were sufficiently reliable ($\alpha_{DG} = .837$, $\alpha_{FTP} = .821$). The mean for each scale was reviewed while being mindful of the 5-point rating scale. In general, respondents rated themselves as moderately high in delay of gratification ($M = 3.593$, $SD = 0.531$) and future time perspective ($M = 3.784$, $SD = 0.491$). Additionally, Table 2 displays all the means and standard deviations, and Table 3 lists the reliabilities and correlations for all the variables of interest.
Hypothesis Testing

The present study uses multilevel modeling (MLM) given that the data involve several observations nested within persons. The level-1 variables were measured within-person (15 times throughout the simulation), and the level-2 variables were measured between-persons (a one-time survey). Multilevel analyses allowed for assessing both within-level and cross-level interaction effects. Results for the hypotheses were obtained using HLM software (Raudenbush & Byrk, 2002), with the exception of Hypotheses 5 and 6 which were tested by conducting linear regressions using SPSS software.

Hypothesis 1 proposed that individuals who perform an effortful task will demonstrate significant shifts in their motivation levels over time. To represent the shifting priorities self-control process model (Inzlicht, Schmeichel, & Macrae, 2014), there were two distinct types of motivations analyzed in this dissertation: have-to motivation exerted on-task and want-to motivation exerted off-task. Therefore, two separate analyses were conducted in HLM to assess the shifts in each type of motivation throughout the simulation. Table 4 provides a summary of the within-person relationships for have-to and want-to motivation levels over the duration of the study.

Hypothesis 1A (H1A) specifically involves decrements in participant motivation towards having to engage in effortful exertion during a given period of time. This was examined with time as the level 1 predictor and have-to motivation as the level 1 outcome. The results indicate a significant decrease in have-to motivation levels within individuals ($\gamma_{10} = -.008, p < .001$; decreasing over time), thus supporting H1A. Therefore, results support that people experience a reduction in have-to motivation towards on-task performance following initial exertion. Additionally, Hypothesis 1B (H1B) involves
Shifting motivational priorities increases in motivation towards wanting to engage in behaviors away from the effortful task. This was examined with time as the level 1 predictor and want-to motivation as the level 1 outcome. The results show support for H1B because there is a significant increase in want-to motivation level off the task ($\gamma_{10} = .014$, $p < .001$; increasing over time). Thus, Hypothesis 1 was fully supported, thereby indicating that the respective motivational shifts do in fact occur over time.

Hypothesis 2 states that delay of gratification will significantly predict the slope for motivation levels. For Hypothesis 2A (H2A), this relationship was examined with time as the level 1 predictor, have-to motivation as the level 1 outcome, and delay of gratification as the level 2 predictor of level 1 intercepts and slopes. For H2A, the slope for have-to motivation on the effortful task was not significantly associated with delay of gratification ($\gamma_{11} = .001$, ns). This result shows that H2A was not supported. In addition, Hypothesis 2B (H2B) involved whether the positive slope for want-to motivation is weaker for those with high delay of gratification. To test this, time was set as the level 1 predictor, want-to motivation as the level 1 outcome, and delay of gratification as the level 2 predictor of level 1 intercepts and slopes. The results indicated that H2B was not supported, suggesting that those who rated themselves highly on delaying gratification did not have a weaker shift towards an increased level of want-to motivation off the task ($\gamma_{11} = .002$, ns). In sum, Hypothesis 2 was not supported by the results.

Hypothesis 3A (H3A) suggested that those with a strong focus on the future (high future time perspective) would experience slower drops in have-to motivation levels over time. This was examined with time as the level 1 predictor, have-to motivation as the level 1 outcome, and future time perspective as the level 2 predictor of level 1 intercepts.
Shifting motivational priorities

and slopes. The results indicated that future time perspective was not a significant level-2 predictor ($\gamma_{11} = .003$); however, it was approaching significance ($p < .10$). Next, Hypothesis 3B involved the link between high future time perspective and slower increases in wanting to move off task. This was analyzed with time as the level 1 predictor, want-to motivation as the level 1 outcome, and future time perspective as the level 2 predictor of level 1 intercepts and slopes. The findings show that H3B was not supported ($\gamma_{11} = .003, \text{ns}$).

Hypothesis 4 proposed that future time perspective moderates the relationship between delay of gratification and motivational shifts. To assess this moderation hypothesis, an interaction variable was created by standardizing and multiplying the predictors, and entering the new term as an additional level-2 predictor (after delay of gratification and time perspective). Specifically, in Hypothesis 4A (H4A), this was examined with time as the level 1 predictor, have-to motivation as the level 1 outcome, and delay of gratification, future time perspective, and the interaction variable as level 2 predictors of level 1 intercepts and slopes. For H4A, the interaction effect between delay of gratification and future time perspective on have-to motivational shifts was not significant ($\gamma_{13} = .007, \text{ns}$). To examine Hypothesis 4B (H4B), the only change made to the analysis was to replace the level 1 outcome with want-to motivation. Results for H4B indicate that there is a significant interaction effect for delay of gratification and future time perspective on the slope for wanting to go off task ($\gamma_{13} = -.057, p < .05$).

Interestingly, the pattern of results (see Figure 2 in Appendix E) indicates that when individuals were high on both delay of gratification and future time perspective, their want-to motivation decreased over time. In contrast, for other levels of delay of
Shifting motivational priorities

Gratification and future time perspective, want-to motivation consistently increased over time. This is somewhat consistent with H4B in that want-to motivation slope was not positive for those high in delay of gratification and future time perspective. However, the hypothesis implied that this slope would be weaker (strength effect) rather than negative (direction effect) and thus this pattern of results is not fully consistent with the hypothesis. Overall, the results indicate that Hypothesis 4 was not fully supported but the interaction effect for H4B is noteworthy.

For Hypothesis 5, shifts in motivation were proposed to be linked directly to objective work ethic behaviors, in particular, the amount of time spent engaging on the task (labor) and off the task (leisure). To examine this hypothesis, first the within person Empirical Bayes slope estimates for have-to motivation and want-to motivation (i.e., the relationship between time and have-to or want-to motivation for each person) were calculated in HLM and imported into SPSS. Hypothesis 5A (H5A) suggested that people who experience weaker drops in have-to motivation levels are more likely to remain on task for a longer amount of time. Therefore, to evaluate H5A a simple linear regression was conducted to predict time spent on-task with the calculated have-to motivation slopes. The results show that the shift in have-to motivation was not a significant predictor of time on the effortful task ($\beta = .062, \ ns, \ R$-square $= .004$). Thus, H5A was not supported. For Hypothesis 5B (H5B), it was proposed that individuals’ want-to motivation shift will predict the amount of time spent off the letter-crossing task. The total time off-task was calculated based on: (a) time actively spent reading through the newsfeed articles and (b) inactive time spent idle in the simulation. To test H5B, a simple linear regression was conducted to evaluate the influence of want-to motivation changes.
Shifting motivational priorities

on time directed off the task. The want-to motivation slope was not significant in predicting the total time participants spent off-task ($\beta = -.024$, ns, $R$-square $= .001$). Interestingly, however, want-to motivation slope was a significant predictor of active time participants spent engaging in the newsfeed (off-task). As slope of want-to motivation increased, time spent off the task reading newsfeed articles also increased ($\beta = .116$, $p < .05$, $R$-square $= .013$). Thus, although H5B was not supported, there was support for a positive relationship between want-to motivation slope and length of time engaging in active off-task leisurely behavior (reading newsfeed articles).

Hypothesis 6 (H6) proposed a positive relationship between time on task and task performance. Results demonstrated a positive relationship ($\beta = .739$, $p < .001$, $R$-square $= .546$). Thus, H6 was supported.

**Discussion**

The goal of this dissertation was to examine the self-control process in more detail, drawing from the shifting priorities self-control process model (Inzlicht & Schmeichel, 2012). A review of the literature in this area has highlighted the current conceptual and replication crises that have called previous self-control findings into question (Friese, Loschelder, Gieseler, Frankenbach, & Inzlicht, 2018). The current self-control debate has identified a need for deeper understanding of this popular construct while using better methodologies. Recently, alternative models of self-control have been proposed in an effort to explain the finer details of the underlying processes. In an attempt to identify the role of motivation in the self-control process, the shifting priorities model was introduced to the literature (Inzlicht & Schmeichel, 2012). This theory
suggests that over time there is a decrease in have-to motivation towards the task and an increase in want-to motivation away from the task, a key function that has been overlooked in the self-control failure research. Furthermore, the literature has emphasized that there has been no empirical studies that evaluate if and/or how these shifts occur while in goal pursuit (Milyavskaya & Werner, 2018). Interestingly, early self-regulation researchers highlighted the importance of these adjustments during goal pursuit by explaining it as recalibration of the reference value for the feedback loop (Carver & Scheier, 1990). Therefore, the present study aimed to provide clarity regarding the underlying motivational adjustments that occur once effort is exerted. This dissertation was able to detect these intrapersonal changes in specific motivation levels by using a computer-based simulation with multiple probes throughout the study. The central focus of this study was the individual’s priorities because the direction and intensity of these competing motivational shifts may be essential in understanding how self-control works.

Overall, the most important outcome of the current study is the empirical support for the motivational changes over time as proposed in the shifting priorities model. Previous studies rarely examined the impact that changing motivations can have on self-control (Milyavskaya & Werner, 2018); thus, the present study extends this research area by directly measuring these shifts in personal priorities and linking them to influential predictors and outcomes. Although the results for the individual predictors were not significant for either motivational shift hypothesis, there was an interesting finding for the interaction effect. Specifically, future time perspective was found to be a significant moderator for the relationship between delay of gratification and wanting to go off-task, such that those with high future time perspective and high delay of gratification trended
Shifting motivational priorities towards a decrease in want-to motivation off-task over time, instead of the typical increase. Given that an increase in want-to motivation over time is indicative of self-control failure (Inzlicht & Schmeichel, 2012), this study’s finding of a decrease in wanting to go off task for those high in both traits could be interpreted as a sign of successful self-control. Furthermore, the present study assessed the link between the internal shifts in motivation and task performance outcomes by examining the amount of time spent engaging in labor or leisure work ethic behaviors. Although the motivational slopes did not predict overall work ethic tendencies, the results did show that want-to motivation slope positively predicted time spent reading news articles (leisurely off-task behavior). Finally, those who spent more time engaging in labor work ethic behaviors performed better on the letter-crossing task. All in all, this dissertation bridges the current literature gap by: (a) empirically demonstrating the motivational pathway in the shifting priorities model of self-control, (b) assessing key predictors for this mechanism, (c) examining the within-person motivational process and its associated work ethic behaviors, and (d) objectively measuring task performance outcomes throughout the self-control process.

**Within-Person Motivation Shifts Over Time**

The first hypothesis in this dissertation was focused on empirically examining the direction of motivational shifts over time. The current study’s results provide initial evidence on within-person motivation throughout effortful task performance. The aversiveness of the electronic letter-crossing task activates the participant’s need for self-control exertion (Arber et al., 2017), which is essential for persisting on-task and inhibiting desires to veer away from the work. Therefore, once the participant has started
the aversive task and self-control exertion has been engaged, the findings show an overall
decrease in have-to on-task priorities and an increase in want-to off-task priorities. This
refractory period in self-control is suggested to be the product of evolutionary pressures
to balance between the desires for externally rewarding labor and intrinsically rewarding
leisure (Inzlicht, Legault, & Teper, 2014). Neuropsychologists have identified important
brain functions that highlight this preference for an optimal trade-off through the
regulation of task engagement (resource exploitation) versus engaging in other preferred
opportunities (exploration; Gilzenrat, Nieuwenhuis, Jepma, & Cohen, 2010; Jepma &
Nieuwenhuis, 2011). Thus, the first set of findings empirically support the basic idea
underlying the shifting priorities model:

A shift in motivational orientation away from suppressing and inhibiting desires
and toward approaching and gratifying them… acts of control lead people to
become less motivated to engage in further deliberative control and more
motivated to engage in things that are more personally rewarding, interesting, and

Importantly, the examined within-person shifts in motivation can help clarify the
current dispute over the depletion effect found in many previous self-control studies. For
instance, in resource depletion studies, the control groups who do not engage in an
effortful task during Time 1 may not have experienced the shifts in motivations;
therefore, their balancing act does not begin until the start of Time 2. The results for the
current study suggests that, on the other hand, those in the “depletion” group have already
experienced an extended period of motivational shifts, thus ending Time 1 with
significantly decreased levels of have-to on-task and increased levels of want-to off-task
Shifting motivational priorities compared to those in the control group. These findings suggest that motivational shifts can be an alternative explanation for the mixed results in the self-control literature. Previously, researchers highlighted resource depletion as the cause of self-control failure, but the present study shows that resource-dependent theories may not tell the whole story without accounting for shifts in motivations for both the control and depletion groups.

**Between-Person Effects on Motivation Shifts Over Time**

How significant are individual differences to the motivational factors that regulate selection and persistence towards a task? Self-control theorists highlighted this and similar outstanding questions that remain unanswered in the current literature (Inzlicht & Schmeichel, 2012). Furthermore, researchers have called for more studies to look into additional proximate causes to better understand why there are limitations in self-control and to clarify mixed results by examining underlying cognitive processes (Scott-Phillips Dickins, & West, 2011). Therefore, the present study aimed to evaluate important between-person predictors that can impact within-person motivational shifts.

Hypotheses 2 and 3 analyzed two key self-regulatory constructs (delay of gratification and future time perspective) as important individual differences that influence the self-control process. These constructs have been a critical part of the conceptual crisis, primarily because decades of research misused these constructs and consequently muddied the self-control waters. For example, various earlier studies applied identical methodologies (marshmallow test) to help explain distinct concepts (self-control, delay of gratification, and time perspective; Baumeister & Alquist, 2009; Mischel, 2015; Zimbardo & Boyd, 2015). In the past few years, research has considered the relationship between these three distinct traits. Specifically, a recent longitudinal
study found that high delay of gratification at Time 1 was a significant predictor for high self-control and future time perspective at Time 2 (Watson & Milfont, 2017). That same study called for further research to examine these related variables using more measurement points and alternative measures; therefore, this dissertation integrated hypotheses for this important set of self-regulatory variables.

Over the years, the lack of clear operationalization across these variables has resulted in confusion among definitions, measures, and result interpretations. Thus, this study improved upon previous methodologies by heeding the advice from a meta-analysis that insisted future research interested in studying the impact of these constructs must consider that the “optimal measurement strategy is to include both task and questionnaire measures” (Duckworth & Kern, 2011, p. 11). The present study extended the research by integrating an innovative, objective, and electronic form of self-control measurement to reduce human error and more strategically assess the relationship of these three variables.

In the current study, the results showed that neither delay of gratification nor future time perspective were significant predictors of the self-control process. However, previous research has consistently indicated that delay of gratification and future time perspective have significant positive relationships with trait self-control (Göllner, Ballhausen, Kliegel, & Forstmeier, 2018; Romer, Duckworth, Sznitman, & Park, 2010). Notably, this major difference in the findings highlights one key distinction between the previous studies and this current study – trait versus state relationships. Researchers have noted that trait level results can vary significantly from state level results, which is why there has been a call for more within-person research on self-control (Inzlicht and Schmeichel, 2012; Milyavskaya & Inzlicht, 2015). Additionally, it has been stated that
Shifting motivational priorities

“models that take into account within-person inconsistency may have greater potential explanatory power than trait models” (Nezlek, 2007, p. 790). Although trait models have certain advantages, the model presented in this study aimed to extend the self-control literature by examining the relationship of delay and time perspective with the within-person process of self-control in a situation (state level). These inconsistent results identify a need for more research on state-level relationships between self-control, delay of gratification, and future time perspective.

Furthermore, the goal was to test the effects of important individual differences on the shifting priorities model. Inzlicht and colleagues (2012, 2014) focus primarily on slopes when proposing their model; therefore, this dissertation only examined those propositions and key proximate causes. Even though delay of gratification and future time perspective were not significant predictors for motivational slopes in the self-control process, the impact of these predictors on the motivational intercepts have not been proposed or examined yet. Thus, although the individual differences were not predictive of shifts in motivation over time, they might be useful in understanding variance in individuals’ motivational starting points (intercepts). Given that the slope effects were non-significant, it would be beneficial to consider the predictive ability of delay and time perspective traits on have-to and want-to motivation intercepts.

**Interaction Effects on Motivation Shifts Over Time**

Aside from the need for more research on how individual differences impact motivational mechanisms, self-control researchers have also called for additional studies examining important moderators to help explain these mechanisms (Inzlicht & Schmeichel, 2012). Although the traits did not independently predict shifts in priorities,
the present study examined future time perspective as a moderator for the relationship between delay of gratification and motivational shifts underlying self-control. Notably, the self-control priorities model suggests that “the inherent disutility of mental work accumulates the more one has worked, meaning that ever more external rewards are needed to counteract the aversiveness of work, or else people will gravitate toward inherently rewarding leisure instead” (Inzlicht et al., 2014, p. 129). Additionally, research shows that people who rate themselves higher on these self-regulatory constructs are likely to be more mindful of future goals, less impulsive towards immediate rewards, and perceive greater salience for delayed incentives (Mischel, Ebbesen, & Zeiss, 1972; Seligman, Railton, Baumeister, & Sripada, 2013; Zimbardo & Boyd, 2015). Therefore, those high in these individual differences may perceive lower ‘inherent disutility’ from aversive mental effort exertion, ultimately helping sustain motivation levels over time. However, this argument was not supported by the findings for H4A. The interaction results showed that the combination of these traits did not significantly influence the decrease in have-to motivation levels throughout the letter-crossing task.

On the other hand, the interaction results found that the combination of these traits significantly influenced the individual’s motivational intensity for gravitating towards personally enjoyable leisure activities. Specifically, as shown in Figure 2, those high in delay of gratification and future time perspective experienced a decrease in wanting to go off-task over time, underlining that these traits can help counteract motivational shifts ‘toward inherently rewarding leisure’ even when ‘ever more external rewards’ are not provided. In contrast, other trait level combinations demonstrated a positive slope for wanting to go off-task. Although this outcome was more extreme than originally
hypothesized, it appears that the interaction of the self-regulatory constructs on want-to motivation shifts are empirically important. These results indicate that those employees who exhibit high levels of these beneficial self-regulatory traits are better able to balance want-to task priorities by keeping their future gratification in perspective. Thus, these employees are less likely to want to partake in leisure activities during task performance, which could translate to minimizing the organization’s loss in money and employee time.

**Motivation Shifts Linked to Work Ethic Behaviors**

The shifting priorities model suggests that cognitive labor-leisure tradeoffs drive motivational shifts following initial effort exertion (Inzlicht et al., 2014). Additionally, neuropsychologists have identified neural activity for time on-task monitoring, involving cognitive calculations for the time spent on an activity and when it is time to disengage from the task (Grinband, Savitskaya, Wager, Teichert, Ferrera, & Hirsch, 2011; Lim et al., 2010). The motivational shifts that occur between the time a person engages and subsequently disengages from a task are believed to be predictive of differences in work ethic behaviors. Specifically, time on-task has been operationalized as an objective perspective on work ethic that explains one’s prioritization of labor over leisure behaviors (Mann, 2010). Because time is limited, the time spent on-task and off-task have a direct negative relationship with one another; therefore, as a person spends less time on-task they concurrently spend more time off-task (see Table 3 in Appendix D). Therefore, this dissertation measured important outcomes including time spent towards labor (on-task) and leisure (off-task) while tracking within-person changes in motivation during task performance. The current model suggests that when people experience intense
motivational shifts away from an aversive task, they consequently spend less time on-task and thus express fewer labor work ethic behaviors.

The results in the current study showed that a decline in have-to motivation during task performance was not significantly related to less time spent on-task. This highlights that a decline in have-to task motivation over time may not be enough to explain reduced time spent on-task. Additionally, increases in want-to off-task motivation were not predictive of more time spent off task (this included both idle time and newsfeed time). Although people increasingly wanted to do some other personally enjoyable activity, this motivational shift appears to be an insufficient cause for greater leisure work ethic behaviors. Given these findings, it would be beneficial to examine attentional and/or emotional mechanisms within the shifting priorities model to better understand these time on-task differences. Thus, the motivational mechanism alone was unable to predict the work ethic behaviors, but task monitoring and operating processes have been previously proposed as two additional pathways to effortful performance behaviors (Robinson, Schmeichel, & Inzlicht, 2010).

An interesting finding highlighted that increased want-to off-task motivation predicted greater time spent reading articles in the newsfeed sidebar. Although this was not a specific hypothesis, these results give support to H5B by showing that those who experience increased levels of want-to motivation were more likely to actively engage in a personally enjoyable task. This suggests the potential need for a recovery activity following an extended period of aversive work. Also, the trend towards greater leisure work ethic behaviors is important from the organizational perspective. Employees who experience an intense rise in want-to motivation away from an assigned task may be more
Shifting motivational priorities
likely to actively spend work time on social media or other personally rewarding
activities. These leisure work ethic behaviors have proven to be costly and unproductive
for organizations. Thus, even though H5B remains unsupported, this additional result
highlights the potential importance of want-to motivation for the self-control process and
task performance.

**Work Ethic Behaviors Linked to Task Performance**

In the shifting priorities model, self-control failure is directly linked to task
performance decrements which are hypothetically influenced by the rate and direction of
change in a person’s specific motivation levels following initial effort exertion (Inzlicht
& Schmeichel, 2012). Previously, research procedures measured self-control failure and
task performance decrements interchangeably, but the literature’s current replication
crisis has called for attention to the selection and application of self-control measures
when examining relative task performance outcomes (Lurquin & Miyake, 2017).
Therefore, the current study extended the literature by separately defining and measuring
the two concepts – examining the self-control process (proposed as a down-shift of have-
to motivation and an up-shift of want-to motivation) and simultaneous on-task
performance. The results showed that more time spent on-task led to greater task
performance scores. Previous self-regulatory research has found that time on-task has a
positive significant relationship with performance (Biderman, Nguyen, & Sebren, 2007),
and the present results replicated these findings by showing that high time on-task
predicted greater performance levels in the letter-crossing task simulation. This finding
highlights that labor work ethic behavior is an important predictor for performance
outcomes. By taking this micro perspective and objectively examining the performance
Shifting motivational priorities decrements separate from the concept of self-control, the present study provides novel findings relevant to the ongoing replication crisis.

Practical Implications

The findings from this dissertation may have useful practical implications for organizational outcomes, especially in times when employees are assigned a task at work. For example, once an employee begins working on an effortful assigned task, his/her competing motivations begin to shift (underlying the process of self-control failure) during task performance -- ultimately leading to reducing effort towards the delegated task, and instead spending work time scrolling through social media, reading up on news, texting/chatting about non-work related topics, and other leisurely activities that employers typically do not promote. A study by Intel showed that U.S. organizations lose about $650 billion dollars in revenue every year due to employees indulging in personal time while on the job (Spira & Burke, 2009). Thus, these motivational shifts away from labor and towards leisure likely demonstrate decreased employee productivity due to self-control failure.

Practitioners may be able to leverage the present findings to reduce costly off-task behaviors by selecting and/or training employees for greater delay of gratification and future time perspective (or other beneficial self-regulatory traits) that may emphasize successful self-control exertion. For instance, in addition to other testing, a self-regulation assessment battery can be helpful for identifying which new hires have a lower risk of engaging in personal time while on the job. Additionally, managers can likely make a significant improvement to employee productivity and limit revenue loss from wasted
employee time by clearly communicating future project goals, emphasizing importance of present work for future payoff, and identifying the reward/recognition for hard work. Consistently clear communication from managers regarding key organizational objectives can be critical for activating beneficial self-regulatory traits during the employee’s goal striving process. The present study provides a key bridge for research and practice by highlighting an essential process underlying self-control failure, which has been linked to costly and undesirable employee behaviors (Maranges, & Baumeister, 2016; Marcus & Schuler, 2004).

**Limitations and Future Research**

The first limitation of the present study is that only one of the three parallel processes in the shifting priorities self-control model was analyzed. Inzlicht and colleagues (2014) have proposed that attention, emotion, and motivation processes simultaneously shift following initial exertion; however, their propositions emphasized the importance of the motivational pathway in describing key self-control failures. The shifting priorities model has limited data to support any of the suggested mechanisms; thus, the present study focused on empirical evaluation of the motivational mechanism underlying the self-control process. However, this dissertation’s outcomes explain only a part of the story for the self-control process. It is important to note that without a full examination of all three processes in concert, it is impossible to determine the validity of the entire shifting priorities model. Future research should collect more data on the simultaneous effects of one’s attention, emotion, and motivation throughout aversive task performance to objectively examine the complete within-person process of self-control.
Shifting motivational priorities

The second limitation of this study is the time constraint and its potential impact on the work ethic behavior variables. Specifically, these variables accounted for the amount of time the participant spent on-task and off-task, but the simulation was developed with a 45-minute time limit. During the study, all participants were given the same amount of time to work on the letter-crossing task; however, they had autonomy over their use of time within the simulation. Thus, the 45-minute time constraint could have influenced the expression of work ethic behaviors. For instance, without a time limit individuals may shift towards want-to off-task far sooner or far later. That is, the participant’s motivations towards a task may vary when there is no strict deadline. Arber and colleagues (2017) found that people who were timed versus untimed on the letter-crossing task did not perform differently from one another, but future research should also evaluate timed versus untimed effects on motivational shifts along with task performance.

This study’s third limitation deals with sample generalizability given the data were collected from the Mturk population. Researchers have shown sufficient validity for both Mturk samples and organizational samples, yet the literature still has some doubts regarding the extent to which Mturkers reflect ‘real workers’ (Paolacci & Chandler, 2014). Future research could implement periodic have-to and want-to motivational probes (similar to the probes in the simulation) on employee computers for a multi-day period to examine actual shifts and associated outcomes in a workplace. Results from a real organization can help improve generalizability of these findings and determine the impact of these shifts on employee performance.
The fourth limitation is the inability to control for extraneous factors during the simulation. Because the study was distributed on Mturk, the workers were free to choose when, where, and how they completed the study. Thus, the simulation was not administered under experimental conditions, and the environment and other conditions that were not controlled could have influenced the results. Furthermore, the screen recordings monitored all actions on the computer; however, without controlling the setting of the study, the behaviors engaged in off the computer were not captured. For instance, data were collected for on-screen off-task behaviors (reading news articles), but off-screen off-task behaviors (texting, watching television, etc.) were not measured. Therefore, there may be noise in the variable for idle time that goes into the calculation for time spent off-task. Future researchers should replicate the present study with an experimental procedure by simply administering the same assessments in a laboratory setting under direct researcher supervision. It is imperative to replicate the motivational shift results from this dissertation in a controlled environment to further provide support for the self-control process model.

As suggested by its name, the shifting priorities model only focuses on the within-person shifts and their influence on the self-control process. In the present study, the primary goal was to empirically evaluate the motivational shifts which were operationalized as slope over time. With this dissertation’s initial empirical results on slopes in the shifting priorities model, the foundation is now set for future research to develop propositions for intercept effects on the self-control process. Although the self-regulatory traits did not significantly predict motivational slopes, there is a need for research to evaluate how important constructs impact where a person starts on their
motivational trajectory (i.e., intercepts) during effortful exertion. Thus, future researchers might leverage the present findings to further examine not only slopes, but also differences in the intercepts and their impact on self-control performance.

The importance of rewards in self-control studies is often overlooked. Particularly due to the role of rewards in certain psychological constructs, careless selection of study rewards can create unnecessary noise when interpreting results for variables like delay of gratification, future time perspective, self-control, and motivations. Therefore, the pilot study helped determine an appropriate reward for the participants, but there is a chance that the reward amount was still insufficiently motivating for MTurk workers. Similar to the popular marshmallow study, the reward structure in the present study provided an immediate $4.00 reward (the first marshmallow) for all who participated and an additional delayed reward ($20 gift card; the second marshmallow) for top performers. However, it is important to note this reward structure differs from the marshmallow study, in that the gift card (the second marshmallow) was not a promised reward upon completion. The goal of the reward structure was to emphasize the innate trait of delay of gratification by applying a waiting period between self-control performance and receipt of reward. Additionally, the reward structure aimed to activate effort for future incentives, which attempted to accentuate the perception of effortful time spent towards future ideals. Future research should verify necessary reward amounts to successfully motivate participants in psychological studies, especially when examining variables that are directly affected by the chosen reward structures. To better interpret the motivational outcomes of shifting priorities, it is critical to understand the person’s motive towards the provided rewards (psychological, monetary, or other).
Conclusion

The purpose of the present study was to empirically analyze the motivational process underlying self-control during task performance, as well as examining important predictors and outcomes that influence the process. Although all the hypotheses were not fully supported, the results did support the core notion that within-person motivational shifts occur during performance of a self-control task (as suggested by the shifting priorities model). The inferences drawn from these findings help build an alternative non-resource dependent explanation of the depletion effect; therefore, these empirical results provide the initial building blocks for a new bridge for self-control research. Specifically, a decrease in have-to motivation on-task and an increase in want-to motivation off-task over time is indicative of self-control failure. Thus, this understudied theory has highlighted the importance of examining these internal motivational shifts in parallel with self-control performance outcomes. Therefore, the findings from this dissertation support the possibility that “depletion may be the motivated switching of task priorities, wherein all forms of mental work become increasingly aversive, making mental leisure increasingly attractive” (Inzlicht, Schmeichel, & Macrae, 2014, p. 130). Moreover, to determine the validity and strength of the depletion effect, it is imperative for future research to consider motivation, attention, and emotion shifts before, during, and after the effort exertion period.

Additionally, predictors for the self-control process were examined in order to determine the influence of key self-regulatory traits on motivational shifts. Neither delay of gratification nor future time perspective were significant individual predictors for the motivation slopes over time. However, the two traits interacted significantly for want-to
Shifting motivational priorities

off task motivation shifts, such that those high in both self-regulatory traits were more likely to experience a decrease in wanting to go off-task, in contrast to the typical tendency to feel an increase in wanting to go off task over time. This suggests that there are important traits that can influence the underlying processes of self-control. In addition to the predictors, this study examined the impact of these motivational shifts on key outcomes. The motivational slopes were not linked to active time spent on a task, but the participants who spent more time on-task performed significantly better on the letter-crossing task.

Overall, this dissertation involves a more detailed examination of self-control over time, expanding on Inzlicht and Schmeichel’s (2012) original propositions on the cognitive shifts that drive one’s self-control performance. These findings contribute to this field of research by providing an empirical examination of this understudied theory and the role of motivational shifts in the process of exerting self-control. Researchers can use this study’s simulation methodology and key findings to continue examining self-control patterns over time and the underlying mechanisms responsible for these patterns.
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Shifting motivational priorities


Shifting motivational priorities


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Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


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Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


Shifting motivational priorities


Appendix A: Informed Consent

You are invited to participate in a research study that looks into understanding general responses regarding a workplace situation. A graduate student with the Florida Institute of Technology is conducting this study in order to identify the potential influence of achievement-related behaviors. Participation in this study is entirely voluntary. You can choose not to participate at all or to leave the study at any time.

If you agree to participate, you will be asked to complete an online survey and perform tasks in an online simulation. The survey questions will ask you about your views on rewards and the concept of time. The survey and workstation simulation will take approximately 60 minutes to complete. The recommended web browser for an ideal survey and simulation experience is Google Chrome (NOTE: DO NOT do this study on a mobile or tablet device).

All of your results will remain confidential and secure. No personally identifying information will be collected at any point during the study, and only a response number will identify your responses. Once you complete the study, the researchers may not withdraw your responses because the responses contain no personally identifying information.

The study data, analysis, and aggregated reports will be kept in a digital format on a password-protected database. Access to the digital data will be limited to the researchers and supervising faculty. This study will follow all necessary steps to decrease the risks associated with participating in the survey. Although, it is important to note that when research is conducted online, there is a very small risk that a third party will intercept your information. While you will not experience any direct benefits from participation, information collected in this study may benefit others in the future by helping to gain knowledge about the implications workplace procedures can have on employees. If you have any questions regarding the survey or this research project in general, please contact the principal investigator, Keemia Vaghef, at kvaghef2012@my.fit.edu or the supervising faculty member, Dr. Patrick Converse, at pconverse@fit.edu.

By completing and submitting the survey and simulation, you are indicating your consent to participate in this study.

Selecting 'Yes, I agree to participate' indicates that you agree to participate and that:

1. You are 18 years of age or older.
2. You have read and understand the information provided above.
3. You understand that participation is voluntary.
4. You understand that you are free to discontinue participation at any time.
Appendix B: Individual Difference Measures

*Delay of Gratification Survey Items*

Please rate the extent to which you agree that the following statements describe you and your personal tendencies. (1=Strongly Disagree, 2=Disagree, 3=Neither Agree nor Disagree, 4=Agree, 5= Strongly Agree)

1. Even if I am hungry, I can wait until it is meal time before eating something.
2. I have always tried to eat healthy because it pays off in the long run.
3. I have given up physical pleasure or comfort to reach my goals.
4. I try to consider how my actions will affect other people in the long-term.
5. I try to spend my money wisely.
6. I have always felt like my hard work would pay off in the end.
7. I cannot motivate myself to accomplish long-term goals. (R)
8. I cannot be trusted with money. (R)
9. I do not consider how my behavior affects other people. (R)
10. When faced with a physically demanding chore, I always tried to put off doing it. (R)
11. I would have a hard time sticking with a special, healthy diet. (R)
12. I am good at saving my money rather than spending it straight away.
13. I enjoy an activity even more if I have to wait and plan it out.
14. As a child, I tended to save my pocket-money.
15. When I am in a supermarket, I tend to buy a lot of things that I hadn’t planned on buying. (R)
16. I am constantly running low in my bank account. (R)
17. I believe in the philosophy “Eat, drink and be merry, for tomorrow we may all be dead”. (R)
18. I would describe myself as often being too impulsive for my own good. (R)
19. I often find that it is worthwhile to wait and think things over before deciding.
20. I like to spend money as soon as I get it. (R)
21. It is hard for me to keep from losing control over my emotions when someone gets me angry. (R)
22. I can tolerate waiting for things fairly easily.
23. I am good at planning things way in advance.
**Time Perspective Survey Items**

Please read each item and, as honestly as you can, answer the question: "How characteristic or true is this of you?"

(Using the following scale: 1 = Very Untrue, 2= Untrue, 3= Neutral, 4= True, 5= Very True)

1. I believe that getting together with one's friends to party is one of life's important pleasures.

2. Familiar childhood sights, sounds, smells often bring back a flood of wonderful memories.

3. Fate determines much in my life.

4. I often think of what I should have done differently in my life.

5. My decisions are mostly influenced by people and things around me.

6. I believe that a person's day should be planned ahead each morning.

7. It gives me pleasure to think about my past.

8. I do things impulsively.

9. If things don't get done on time, I don't worry about it.

10. When I want to achieve something, I set goals and consider specific means for reaching those goals.

11. On balance, there is much more good to recall than bad in my past.

12. When listening to my favorite music, I often lose all track of time.

13. Meeting tomorrow's deadlines and doing other necessary work comes before tonight's play.

14. Since whatever will be will be, it doesn't really matter what I do.

15. Painful past experiences keep being replayed in my mind.

16. I try to live my life as fully as possible, one day at a time.

17. It upsets me to be late for appointments.

18. Ideally, I would live each day as if it were my last.
19. Happy memories of good times spring readily to mind.

20. I meet my obligations to friends and authorities on time.

21. I've taken my share of abuse and rejection in the past.

22. I make decisions on the spur of the moment.

23. I take each day as it is rather than try to plan it out.

24. The past has too many unpleasant memories that I prefer not to think about.

25. It is important to put excitement in my life

26. I've made mistakes in the past that I wish I could undo.

27. I feel that it's more important to enjoy what you're doing than to get work done on time.

28. I get nostalgic about my childhood.

29. Before making a decision, I weigh the costs against the benefits.

30. Taking risks keeps my life from becoming boring.

31. It is more important for me to enjoy life's journey than to focus only on the destination.

32. Things rarely work out as I expected.

33. It's hard for me to forget unpleasant images of my youth.

34. It takes joy out of the process and flow of my activities, if I have to think about goals, outcomes, and products.

35. Even when I am enjoying the present, I am drawn back to comparisons with similar past experiences.

36. You can't really plan for the future because things change so much.

37. My life path is controlled by forces I cannot influence.

38. It doesn't make sense to worry about the future, since there is nothing that I can do about it anyway.
Shifting motivational priorities

39. I complete projects on time by making steady progress.

40. I find myself tuning out when family members talk about the way things used to be.

41. I take risks to put excitement in my life.

42. I make lists of things to do.

43. I often follow my heart more than my head.

44. I am able to resist temptations when I know that there is work to be done.

45. I find myself getting swept up in the excitement of the moment.

46. Life today is too complicated; I would prefer the simpler life of the past.

47. I prefer friends who are spontaneous rather than predictable.

48. I like family rituals and traditions that are regularly repeated.

49. I think about the bad things that have happened to me in the past.

50. I keep working at difficult, uninteresting tasks if they will help me get ahead.

51. Spending what I earn on pleasures today is better than saving for tomorrow's security.

52. Often luck pays off better than hard work.

53. I think about the good things that I have missed out on in my life.

54. I like my close relationships to be passionate.

55. There will always be time to catch up on my work.
Shifting motivational priorities

**Simulation Items – Motivational Priorities**

*Read the two statements below very carefully. Please rate the degree to which you agree or disagree with each statement.*

1. "At this moment, I feel like I personally **HAVE TO** do the letter-crossing activity".
   - [ ] Strongly Disagree  [ ] Disagree  [ ] Neutral  [ ] Agree  [ ] Strongly Agree

2. “At this moment, I feel like I personally **WANT TO** do anything other than the letter-crossing task.”
   - [ ] Strongly Disagree  [ ] Disagree  [ ] Neutral  [ ] Agree  [ ] Strongly Agree

Submit
Appendix C: Pilot Study Survey

Please respond to the following questions regarding the study you just completed. Make sure to provide honest and accurate feedback based on your experience.

1. Have you ever worked on the letter-crossing task prior to this study?
   ____ Yes    ____ No

2. Have you ever worked on a computer-based task simulation?
   ____ Yes    ____ No

3. The letter-crossing task simulation felt:
   ____ Too Short    ____ Just Right    ____ Too Long

4. How long do you believe the simulation for the letter-crossing task should be?
   ____ 30 minutes (reduce by 15 minutes)
   ____ 45 minutes (keep as is)
   ____ 60 minutes (increase by 15 minutes)

5. If you were getting paid to complete this study on MTurk, what is an acceptable compensation for your efforts:
   ____ $3.00    ____ $3.50    ____ $4.00    ____ $4.50    ____ $5.00    ____ $5.50    ____ $6.00

Indicate how strongly you agree with the following statements:

6. I enjoyed working on the letter-crossing task.
   __ Strongly Disagree    __ Disagree    __ Undecided    __ Agree    __ Strongly Agree

7. The letter-crossing was pleasant to work on.
   __ Strongly Disagree    __ Disagree    __ Undecided    __ Agree    __ Strongly Agree

8. The letter-crossing task was tiring to perform.
   __ Strongly Disagree    __ Disagree    __ Undecided    __ Agree    __ Strongly Agree

9. I preferred the reading articles in the newsfeed more than performing the letter-crossing task.
   __ Strongly Disagree    __ Disagree    __ Undecided    __ Agree    __ Strongly Agree

10. I believe that the study took too long to complete.
    __ Strongly Disagree    __ Disagree    __ Undecided    __ Agree    __ Strongly Agree
Demographics

11. Gender
   ______ Male    ______ Female

12. Age
   _____ 18-24 years old   _____ 25-34 years old   _____ 35-44 years old   _____ 45 years & older

13. What is the highest level of education you have completed?
   __ High School Diploma/GED
   __ Associate’s Degree
   __ Bachelor’s Degree
   __ Master’s Degree
   __ Doctorate Degree

14. I identify my ethnicity as:
   __ Asian
   __ African American
   __ Caucasian
   __ Hispanic
   __ Other

15. How many hours per week do you work right now?
   __ None
   __ Less than 10
   __ 10-20
   __ 21-30
   __ More than 30

16. How many years of work experience do you have?
   ___ None    ___ 1-2      ___ 3-5       ___ 6-8      ___ More than 8

17. Which of the following levels best describes your highest level of work experience?
   __ Entry-level employee
   __ Senior-level employee
   __ Entry-level Management
   __ Mid-level Management
   __ Upper Management
   __ Other
   __ None

18. Indicate your skill level for working on computer-based tasks:
   ______ Very Poor   ______ Below Average   ______ Average   ______ Above Average   ______ Excellent
### Table 1. Demographic Frequencies

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<td>35-44 years old</td>
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### Shifting motivational priorities

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<td>Above Average</td>
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<td>Excellent</td>
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<td>89.2</td>
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Table 2. Descriptive Statistics

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<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
<th>SE</th>
<th>Kurtosis</th>
<th>SE</th>
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<tr>
<td>Delay of Gratification</td>
<td>1.95</td>
<td>4.81</td>
<td>3.593</td>
<td>.531</td>
<td>.095</td>
<td>.135</td>
<td>-.661</td>
<td>.269</td>
</tr>
<tr>
<td>Future Time Perspective</td>
<td>2.31</td>
<td>4.69</td>
<td>3.784</td>
<td>.491</td>
<td>-.521</td>
<td>.135</td>
<td>-.062</td>
<td>.269</td>
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<tr>
<td>Have-To Motivation⁴</td>
<td>1.00</td>
<td>5.00</td>
<td>3.876</td>
<td>1.142</td>
<td>-.938</td>
<td>.183</td>
<td>-.058</td>
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<td>5.00</td>
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<td>46</td>
<td>30.77</td>
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<td>46</td>
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a. These values represent the averages over the multiple responses for each within-person variable. It is important to note that the overall within-person scores were not used in the analyses.
Table 3. Correlations and Reliabilities

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<th>5</th>
<th>6</th>
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<tbody>
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<td></td>
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<td></td>
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<td>(.821)</td>
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<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>3. Have-To Motivation(a)</td>
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<td>.110</td>
<td></td>
<td></td>
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<td>4. Want-To Motivation(a)</td>
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<td>.034</td>
<td>.034</td>
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<tr>
<td>5. Total Time On-Task</td>
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<td>.254**</td>
<td>.172*</td>
<td>-.203**</td>
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<td>6. Total Time Off-Task</td>
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<td>-.253**</td>
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<td>.200**</td>
<td>-.999**</td>
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<td>8. Task Performance</td>
<td>.220**</td>
<td>.228**</td>
<td>.178*</td>
<td>-.055</td>
<td>.739**</td>
<td>-.741**</td>
<td>-.117*</td>
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</tr>
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Note: Values in parentheses are reliabilities.
* Correlation is significant at .05 level (2-tailed).
** Correlation is significant at .01 level (2-tailed).
\(a\) These values represent the averages over the multiple responses for each within-person variable. It is important to note that the overall within-person scores were not used in the analyses.
Table 4. Hierarchical Linear Model Results

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<th>Variables</th>
<th>( \gamma )</th>
<th>SE</th>
<th>( p )</th>
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</thead>
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<td><strong>Dependent Measure: Have-to Motivation</strong></td>
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<td>Level-1 Predictor (only)</td>
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<tr>
<td>Time</td>
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<td>.000</td>
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<tr>
<td>Level-2 Predictors (including Level 1)</td>
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<td></td>
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<tr>
<td>Delay of Gratification</td>
<td>.001</td>
<td>.002</td>
<td>.545</td>
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<tr>
<td>Future Time Perspective</td>
<td>.003</td>
<td>.002</td>
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<tr>
<td>Level-2 Interaction (including Level 1 &amp; Level 2)</td>
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</tr>
<tr>
<td>Delay of Gratification x Future Time Perspective</td>
<td>.007</td>
<td>.026</td>
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<tr>
<td><strong>Dependent Measure: Want-to Motivation</strong></td>
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<tr>
<td>Level-1 Predictor (only)</td>
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<tr>
<td>Time</td>
<td>.014</td>
<td>.002</td>
<td>.000</td>
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<tr>
<td>Level-2 Predictors (including Level 1)</td>
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</table>
Table 5. Linear Regression Results

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<tr>
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<th>t</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Have-to Motivation Slope</td>
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<td>Want-to Motivation Slope</td>
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<td>Dependent Variable: Time Spent on Newsfeed (only)</td>
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<tr>
<td>Want-to Motivation Slope</td>
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<td>Time Spent On-Task</td>
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<td>19.72</td>
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Appendix E: Figures

Figure 2. Interaction effect for delay of gratification and future time perspective on want-to motivation slope over time.
WTM = Want-to Motivation; TIME_MIN = Time in minutes