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INVESTIGATING PROCRASTINATION AND DELAY FROM A SELF-REGULATED LEARNING PERSPECTIVE

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

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Abstract

Previous research shows that academic procrastination is maladaptive and is associated with negative learning outcomes such as decreased self-regulation, motivation, and grades. However, some recent research suggests that some students might intentionally procrastinate for positive or adaptive reasons such as maximizing learning in a minimal amount of time. Since adaptive forms of delay seem to involve positive self-regulatory and motivational characteristics, follow up research has questioned whether the purported positive procrastination behaviors actually involve procrastination.

The current study investigated this issue by examining the relationships between certain self-regulatory skills (prioritizing, time management, self-monitoring) and two types of procrastination (active and irrational). To facilitate this research, a new measure of self-regulation was developed specifically for complex tasks executed over time and in contexts involving multiple other tasks. The newly developed Self-regulation Scale for Complex Tasks (S-RCATS) was tested to provide greater construct validity evidence for the "intentional delay" aspects of the "active procrastination."

Participants were 326 undergraduate students who completed questionnaires concerning their procrastination, active procrastination, flow, self-regulation, achievement goal orientations, self-efficacy, and perceptions of instrumentality. The findings showed that the newly developed S-RCATS was related to several antecedent and outcome variables of self-regulation, thereby confirming the self-regulatory nature of the scale. Self-regulatory skills were positively related to all but the intentional decision to procrastinate aspects of active procrastination. On the other hand, self-regulatory skills were negatively related to irrational procrastination. The results suggest that self-regulation is a major component of the concept of active procrastination, but procrastination is not. Therefore,

active procrastination may be better characterized as a self-regulated delay rather than a positive type of procrastination.

Although initial analyses indicated that intentional delayers were very similar to non-intentional delayers in terms of their self-regulation, motivation, and behavior, follow-up analyses found that classifying delayers according to their self-regulatory skills revealed two distinct groups of delayers—procrastinators and self-regulated delayers—who had different motivations and behavioral outcomes.

Chapter 1:

Introduction

Procrastination, the act of putting off important tasks, is a prevalent issue in academia. Research and theory on procrastination continues to grow in an effort to better understand its causes and to identify interventions to help students reduce problematic procrastination behaviors. Research on student procrastination has typically focused on the negative motivational factors associated with procrastinating (e.g., fear of failure; performance goal orientation), the ego protective benefits of procrastinating (e.g., self-handicapping), and detriments to performance (e.g., poor grades). However, recent research suggests that some procrastination might actually be positive or may lead to flow experiences (Choi & Moran, 2009; Chu & Choi, 2005; Schraw, Wadkins, & Olfason, 2007; Seo, 2011).

Unfortunately, part of the problem with portraying procrastination in a positive sense is that it contradicts how prior research operationalized procrastination as an inability to self-regulate (Pychyl & Flett, 2012; Steel, 2007) as well as being a needless (Pychyl & Flett, 2012) or irrational delay that leads to less than desirable outcomes such as poor academic performance (Lay, 1986; Solomon & Rothblum, 1984; Steel, 2007; 2010; Tice & Baumeister, 1997). Viewed from this perspective, procrastination ultimately undermines the potential quantity and quality of one's work. Thus, it may be a disservice to the study of procrastination to suggest that there are certain types of procrastination that are positive. Furthermore, confusion arises when researchers use procrastination and delay interchangeably. For example, "all procrastination is delay, but not all delay is procrastination" (Pychyl, 2010, p. 26), and the purportedly positive procrastination

behaviors may actually be unique delay behaviors that are part of an overarching self-regulatory system, rather than acts of avoidance.

Due to its maladaptive and self-defeating characteristics, procrastination is often considered to be a self-regulatory failure (Lay & Schouwenburg, 1993; Pychyl & Flett, 2012; Steel, 2007; Tice & Baumeister, 1997). Self-regulation refers to the thoughts, feelings, and behaviors that are oriented to the attainment of personal goals (Zimmerman, 2000). Self-regulated learners are proactive in their learning and systematically use metacognitive, motivational, and behavioral strategies to acquire information or skills that involve agency, purpose, and instrumentality (Zimmerman, 1986; 1989; 1990). Self-regulated learners tend to experience high self-efficacy, intrinsic interest for tasks, and adopt mastery goal orientations (Pintrich, 2000; Schunk 1986; Zimmerman, 1985). On the other hand, learners who are poorly self-regulated learners often defer tasks until the last moment (Bandura, 1997) and tend to experience low self-efficacy, adopt performance goal orientations, have fears of failure, and experience anxiety (Pintrich, 2000; Zimmerman, 2002)—all of which are commonly found among procrastinators (Lay, 1994; Lay & Schouwenburg, 1993; Park & Sperling, 2012; Steel, 2007; van Erde, 2003; Wolters, 2004).

Unlike self-regulated learners who possess metacognitive skills that allow them to plan, organize, monitor, and evaluate their own learning (Zimmerman, 1990), research has shown that procrastinators tend to use ineffective learning strategies and lack metacognitive skills (Howell & Watson, 2007). Self-regulated learners select, structure, and organize environments for optimal learning (Henderson, 1986; Wang & Peverly, 1986; Zimmerman & Martinez-Pons, 1986). However, procrastinators are often disorganized, poor managers of their time (Howell & Watson, 2007; Lay, 1986; Lay & Schouwenburg, 1993; Pychyl et al., 2000; Steel 2007), and have a tendency to underestimate the amount of

time needed to complete tasks (McCown, Petzle, & Rupert, 1987). In short, there is an abundance of empirical evidence to suggest that procrastinators lack many important self-regulatory skills that inhibit their academic performance.

Nevertheless, recent research has suggested that there may be positive or adaptive forms of procrastination. One study by Schraw et al. (2007) found that college students reported two adaptive reasons for procrastinating—*cognitive efficiency* and *peak experience*. Cognitive efficiency was defined as maximizing learning within a limited amount of time. Peak experience was achieved by working under the pressure of time to enhance motivation and to make tasks more engaging and optimally challenging. Moreover, it was reported that students intentionally procrastinated for the two adaptive reasons described above.

Additionally, two other investigations have examined the motivational characteristics of students who reportedly experienced positive outcomes and satisfaction after intentionally procrastinating on certain tasks (Choi & Moran, 2009; Chu & Choi, 2005). In these investigations, the authors purportedly identified a positive form of procrastination—*active procrastination*—and attempted to develop an instrument that would distinguish "active" from "passive" procrastinators. Passive procrastinators were characterized as being unable to make a decision and act in a timely manner. On the other hand, active procrastinators were characterized as having made intentional decisions to procrastinate, having a preference for time pressure, having the ability to meet deadlines, and having experienced satisfaction with outcomes on tasks on which they procrastinated. It is important to note that the researchers consider both unplanned delays and intentional delays to be procrastination.

However, two recent investigations (Corkin, Yu, & Lindt, 2011, Mortensen & Miller, 2012) have shown that active procrastination and procrastination were unrelated and have suggested that active procrastination is actually a unique delay behavior—"active delay" (Corkin et al., 2011) or "self-regulated delay" (Mortensen & Miller) that is governed by students' self-regulatory processes such as self-efficacy (Corkin et al., 2011), achievement goals (e.g., mastery approach) and perceptions of instrumentality (Mortensen & Miller, 2012). Nevertheless, it remains unclear as to what other self-regulatory skills (e.g., time-management, self-monitoring) might be involved that help some students who delay certain academic tasks to achieve high levels of success and flow experiences, where other students do not. Furthermore, contrary to the findings of Choi and Moran (2009), results from two follow-up investigations (Mortensen & Miller, 2012; Park & Sperling, 2012) seem to suggest that students did not report having made intentional decisions to procrastinate. These are important findings because they suggest that students who deliberately delay a task because of other task priorities and time constraints may not perceive their delay as procrastination, but rather a rational and purposeful delay that is part of an overarching self-regulatory scheme.

In short, the notion of "active procrastination" suggests that there is a form of procrastination or delay that has positive motivational and learning outcomes (e.g., Choi & Moran, 2009; Chu & Choi, 2005). Follow up research has questioned whether this phenomenon is truly a form of procrastination or whether it is actually a form of self-regulation governing peoples' actions on complex tasks requiring extended amounts of time and occurring in contexts requiring prioritizing multiple tasks. It is important for researchers to be able to determine whether the phenomenon of "active procrastination" is largely a self-regulation phenomenon or whether it involves procrastination. Falsely

accepting the concept of active procrastination as a form of procrastination may lead individuals to view procrastination as acceptable because it can result in positive outcomes. On the other hand, if the observed delay were really the result of self-regulation, not procrastination, it would highlight the importance of developing self-regulatory skills in students. Additionally, being able to distinguish task delays that are part of self-regulation rather than procrastination will make it easier to more accurately distinguish between sources, possible consequences, and different forms of procrastination and delay.

Thus, building on the active or adaptive procrastination research (Choi & Moran, 2009; Chu & Choi's, 2005; Schraw et al., 2007) in conjunction with the findings of Corkin et al. (2011) and Mortensen and Miller (2012) as well as the self-regulation theory framework (Pintrich, 2000), the current investigation will attempt to provide validity evidence for a newly developed scale of self-regulation designed specifically for complex tasks executed over time and in contexts involving multiple other tasks. The study was designed to provide greater construct validity evidence for the "intentional delay" aspects of the "active procrastination" measure (Choi & Moran, 2009; Chu & Choi, 2005). This was done in two steps. First, I used the statistical methods of factor analysis to determine whether the new self-regulatory scale was related to the subscales of the Active Procrastination Scale as hypothesized. Second, this measure was correlated with other antecedent and outcome variables to support the self-regulatory nature of the new scale.

Significance of the Problem

It remains unclear how specific contexts, tasks, and motivational profiles influence the types of delay behaviors in which students engage. That is, different academic projects and assignments in conjunction with a student's self-regulatory style will differentially influence how students approach their academic assignments. Thus, it is important to

understand the specific underlying motivational characteristics as well as the conditions, tasks, and contexts that lead students to engage in one form of delay over another (e.g., self-regulated delay, procrastination). Understanding the task characteristics that cause students to procrastinate or delay certain tasks can help educators implement instructional activities that are more relevant and engaging for students. Finally, understanding how some students are able to achieve success and flow experiences despite their engagement in delay behaviors may help in developing intervention strategies for those students who struggle with procrastination and its negative effects.

Chapter 2:

Literature Review and Research Purpose

Procrastination

Procrastination has been explored across a variety of domains and contexts; however, one of the problems underlying procrastination research is in the abundance of different ways that researchers have operationalized procrastination. For example, Schouwenburg (1995) simply defined procrastination as the behavior of postponing tasks. However, it is not clear whether Schouwenburg's definition makes a distinction between intentional or non-intentional postponements. Schraw et al. (2007) on the other hand, defined procrastination as an intentional deferment or delay of work that must be completed. Ellis and Knaus (1977) described procrastination as an irrational delay behavior in which one chooses a particular course of action despite the negative consequences or outcomes that may result. Solomon and Rothblum (1984) described procrastination as the act of needlessly delaying tasks; thereby suggesting that procrastination is negative and undesirable. In a meta-analytic review of procrastination, Steel (2007) defined procrastination as a voluntary delay of an intended course of action despite expecting to be worse off because of the delay.

Despite the wide variation in definitions, procrastination is often associated with negative connotations, and most of the existing literature portrays procrastinators as lazy, unmotivated, and unable to self-regulate (Ferrari, 2001). Previous empirical studies have demonstrated that procrastination undermines one's potential and hinders academic success because it decreases the quality and quantity of learning and leads to an increase in stress and negative outcomes for students (Ferrari, Johnson, & McCown, 1995; Milgram, Gehrman, & Keinman, 1992).

Some research has shown that procrastination tends to increase as students advance in their academic careers and become more self-regulated with higher-ability students procrastinating more than lower-ability students (Ferrari, 1991). However, it is unclear if procrastination and delay are being used interchangeably. Other research revealed that cramming behaviors were more frequent among experienced college students (juniors and seniors) than less experienced college students (freshmen and sophomores) (Vacha & McBride, 1993). While successful college students report procrastinating and cramming more, such behaviors have sometimes showed little negative impact on performance because it allows individuals to achieve a sustained level of flow and make better use of their time (Brinthaupt & Shin, 2001; Csikszentmihalyi, 1990; Schraw et al., 2007; Sommer, 1990).

Students often procrastinate as a way to avoid uninteresting or aversive tasks (Ackerman & Gross, 2005; Milgram, Marshevsky, & Sadeh, 1995; Solomon & Rothblum, 1984) or as a way to regulate negative emotions that are associated with aversive tasks (Baumeister, Heatherton, & Tice, 1994). When students find a learning activity to be uninteresting, they sometimes attempt to regulate their interest by generating interest-enhancing strategies to raise the situational interest of the task (Sansone, Weir, Harpster, & Morgan, 1992). Some researchers have suggested that some students intentionally procrastinate to make uninteresting tasks more challenging—thereby using procrastination as an interest-enhancing strategy to generate arousal and stimulation (Ferrari, 1992).

For students who require intense levels of stimulation, procrastination can be used as a strategy for self-motivating action. For example, some students report that they can work efficiently only after engaging in procrastination behaviors. Still, many procrastinators report that they tend to work better, faster, and generate more creativity while working

under the time pressure of an encroaching deadline (Chu & Choi, 2005; Ferrari, Johnson, & McCown, 1995).

While the majority of procrastination research has focused on the negative outcomes and has looked at differences between procrastinators and non-procrastinators, several studies have attempted to investigate people who use procrastination intentionally and strategically, and have identified procrastination behaviors that are purportedly functional (Ferrari 1993), adaptive (Schraw et al., 2007), and positive (Choi & Moran, 2009; Chu & Choi, 2005). However, the results remain questionable due to definitional and methodological problems, and it remains unclear how students who intentionally delay or procrastinate differ from students who do not. A summary of the findings and associated problems are described in greater detail below.

Arousal Procrastination

Researchers tend to conceptualize procrastination as a way to avoid aversive tasks (avoidance procrastination). However, a study by Ferrari (1992) suggested that some procrastinate to generate arousal and stimulation, where one experiences a rush while working under pressure to complete a task before the deadline. Ferrari (1992) examined the construct and discriminant validity of two procrastination measures: the General Procrastination Scale (GPS, Lay, 1986) and the Adult Inventory for Procrastination (AIP, McCown & Johnson, 1989) and found that the measures were significantly related to task delay but not to each other and assumed that they measured different constructs or types of procrastination.

The GPS is a 20-item scale that contains statements such as "I generally return phone calls promptly" and "I usually buy even an essential item at the last minute." The GPS has a Cronbach's alpha of .82. Lay (1986) reported that scores on the GPS related to

disorganization and tardiness. The AIP is a 15-item scale that contains statements such as "I am not very good at meeting deadlines" and "I don't get things done on time." The authors reported that the scale had a Cronbach's alpha of .79. McCown and Johnson (1989) reported that scores on the AIP were predictive of delays in paying telephone bills, filing tax returns, and returning postage-paid surveys. Ferrari (1992) found that scores on the GPS were positively correlated with sensation seeking and that scores on the AIP were negatively correlated with a need for cognition and self-esteem. In short, he concluded that the GPS measured procrastination motivated by sensation seeking and that the AIP measured procrastination motivated by avoidance behavior.

However, an investigation by Simpson and Pychyl (2009) partially replicated Ferrari's (1992) study but not his findings. In the study, 311 first-year university students completed the GPS and three arousal-based personality inventories. The results of the study failed to find a relationship between arousal-based personality traits and procrastination even though some participants believed that their procrastination was motivated by a need for arousal. Thus, the authors concluded, "Individuals who claim that they are motivated to procrastinate because they believe they work better under pressure are likely fooling themselves, providing a seemingly believable explanation to excuse their procrastinatory behavior" (p. 910).

Furthermore, in a meta-analytic review of different types of procrastination, Steel (2010) found that Ferrari's results proved to be an outlier—"approximately 15 standard deviations outside the average, occurring by chance 1 in 2.87×10^{-51} times" (p. 927). Thus, while Ferrari concluded that that the GPS and AIP measure arousal and avoidance procrastination types, respectively, and were unrelated to each other, Steel's meta-analysis revealed that these two scales showed one of the strongest pairings among all

procrastination measures with a corrected correlation of .86 that was based on 17 studies and 3,638 respondents.

Active Procrastination

Two other investigations looked at the motivational characteristics of students who experience positive outcomes and satisfaction after deliberately procrastinating on certain tasks (Choi & Moran, 2009; Chu & Choi, 2005). In these investigations, the authors purportedly identified a positive form of procrastination—*active procrastination*—and attempted to develop an instrument that would distinguish "active" from "passive" procrastinators. Passive procrastinators were characterized as being unable to make a decision and act in a timely manner. On the other hand, active procrastinators were characterized as having made intentional decisions to procrastinate, a preference for time pressure, the ability to meet deadlines, and experienced satisfaction with outcomes on tasks on which they procrastinated.

In the study by Chu and Choi (2005), 230 undergraduate students from three Canadian universities completed a 12-item Active Procrastination Scale (APS) that was designed to measure four defining characteristics of active procrastination: (a) preference for time pressure, (b) intentional decision to procrastinate, (c) ability to meet deadlines, and (d) outcome satisfaction. Results from the investigation indicated that the 12-item APS yielded marginal reliability with a Cronbach's alpha coefficient of .67. Although Chu and Choi (2005) did provide some discriminant validity by showing that the APS and the academic procrastination scale were uncorrelated at .03 ($p > .60$), the authors failed to conduct a confirmatory factor analysis on an additional sample to confirm the proposed four-factor structure of their APS.

To make comparisons between non-procrastinators, passive procrastinators, and active procrastinators, Chu and Choi (2005) created three equal size sub-groups. Participants who scored less than four on the seven-point academic procrastination scale were classified as non-procrastinators and those who scored greater than four were classified as procrastinators. Of the 230 participants, 77 were categorized as non-procrastinators and 153 were categorized as procrastinators. Next, the 153 procrastinators were divided into two groups—passive procrastinators and active procrastinators. Participants who scored less than 4.33 on the APS were classified as passive procrastinators and participants who scored greater than 4.33 were classified as active procrastinators. Of the 153 procrastinators, 74 were classified as passive procrastinators and 79 were classified as active procrastinators.

After comparing the groups, it was found that active procrastinators reported significantly more academic procrastination than non-procrastinators. Additionally, non-procrastinators and active procrastinators reported being more purposeful in their use of time as well as greater control over their time than did passive procrastinators. While non-procrastinators reported greater perceived time control than active procrastinators, no significant difference was found between the two groups for purposeful use of time. Active procrastinators reported a lower level of time structure than passive procrastinators and non-procrastinators. Passive procrastinators had a significantly lower self-efficacy than active procrastinators and non-procrastinators, but no significant difference was found between non-procrastinators and active procrastinators. Contrary to Chu and Choi's (2005) expectations, passive procrastinators exhibited a higher level of extrinsic motivation than active procrastinators. Finally, passive procrastinators reported significantly more stress,

more depression, and lower GPA's than both non-procrastinators and active procrastinators.

Choi and Moran (2009) attempted to address the limitations of the study by Chu and Choi (2005) concerning the failure to confirm the hypothesized four-factor structure of active procrastination and the lack of sufficient reliability and validity with the initial 12-item scale. In their study, Choi and Moran (2009) developed a 40-item questionnaire that was based upon a pool of items concerning the various cognitive, affective, and behavioral components underlying the four hypothesized dimensions of active procrastination. The 40-item questionnaire was given to 185 undergraduate business students. The authors used an exploratory factor analysis as a data reduction technique that resulted in a four-factor solution that consisted of four items per scale. The resultant 16-item scale was then subjected to a confirmatory factor analysis using the same data. The 16-item scale was never tested using an independent sample. Reliability coefficients for the four subscales ranged from .70 to .83, and the entire 16-item scale exhibited a Cronbach's alpha of .80. Items on the outcome satisfaction sub-scale included statements such as "My performance tends to suffer when I have to race against deadlines." Items on the preference for time pressure scale included statements such as "It's really a pain for me to work under upcoming deadlines." The intentional decision to procrastinate sub-scale included statements such as "I intentionally put off work to maximize my motivation." Items on the ability to meet deadlines sub-scale included statements such as "I have difficulty finishing activities once I start them."

Consistent with the finding of Chu and Choi (2005), Choi and Moran (2009) found a positive and non-significant relationship between active procrastination and procrastination ($r = .07$, *ns*). Active procrastination was negatively related to time structure,

but positively associated with time control and polychronicity (preference for working on several tasks simultaneously). Choi and Moran (2009) therefore concluded that active procrastinators have a flexible concept of time, tend to engage in more multitasking, and perceive greater sense of control over their time.

Cramming

Cramming and procrastination go hand in hand because as students procrastinate, they inevitably find themselves in situations where they are cramming to study for an upcoming test or complete a project or paper before the deadline. Vacha and McBride (1993) conducted a study that examined weekly study diaries of 166 undergraduate students and found that students who procrastinated were more likely to cram as they rushed to complete a task before the deadline. Contrary to their hypothesis that cramming was an ineffective study strategy, the results from the investigation revealed that crammers' grades were as good as or better non-crammers' grades. Furthermore, while crammers had fewer study sessions, they did tend to spend more hours studying to apparently compensate for the inefficiency of cramming.

More recently, an investigation by Brinthaupt and Shin (2001) demonstrated that for some students, delaying the onset of studying and cramming at the last minute made that activity more optimally challenging and, therefore, more conducive to flow experiences. In the investigation, 167 undergraduate students in introductory psychology courses completed several inventories concerning their study habits and procrastination, and then engaged in a cramming simulation task where they were given 10 minutes to study a psychology textbook chapter. After the study session, participants were tested on the material and then asked to complete a measure of flow. Results of the investigation indicated that students who characterized themselves as crammers outperformed task-

avoiding procrastinators and non-procrastinators on the experimental cramming simulation. Additionally, the crammers reported more flow-like experiences than the task-avoiding procrastinators and non-procrastinators.

It is important to note that the content of the learning materials was related to the coursework of the class from which participants were recruited. Therefore, it is plausible that some of the participants may have perceived the learning materials in the simulated cramming session to be instrumental to a personally valued future goal such as preparing oneself for a course exam or may have had a genuine interest in the content, both of which could have influenced task engagement and learning outcomes.

Procrastination and Flow

Based on the findings by Brinthaupt and Shin (2001), Miller and colleagues (2004) conducted an interview study of 13 participants. In the study, Miller et al. examined a unique task-delay phenomenon described as *flow-generating procrastination* to understand characteristics of students who reported having flow-like experiences while working on academic projects (e.g., papers) after a period of deliberately engaging in procrastination. Miller et al. defined flow-generating procrastination as the "experience of flow when the initiation of an activity has been delayed making it more optimally challenging" (p. 2).

Participants reported having delayed the onset of a project that was followed by an intense and concentrated engagement in the task. Participants also reported that they were able to block out distractions; had a high metacognitive awareness about their competence, the task demands, the time the task would take, and the time that was available; and found satisfaction in completing the project. The task engagement features reported during the interviews corresponded closely to Csikszentmihalyi's (1990) description of flow. Although the participants did not necessarily report procrastinating as a way to increase the challenge

of the task to an optimal level, this is purportedly what happened as participants reported flow-like experiences. However, it is unclear if participants' delay behaviors would be considered procrastination because they seemed to be part an overarching self-regulatory system.

Schraw et al. (2007) also found a relationship between procrastination and flow while conducting a grounded theory investigation that explored the potential adaptive and maladaptive aspects of procrastination that were derived from interviews of 67 undergraduate students. The adaptive characteristics identified were cognitive efficiency and peak experience. The authors defined cognitive efficiency as "maximizing learning in a minimal amount of time" (p. 18). Students reported that they were able to accomplish cognitive efficiency by engaging in "strategic planning, increased focus through concentrated effort, and reducing start-up time by working in one large block of time rather than numerous small blocks" (p. 18). However, the two adaptive characteristics seem to involve metacognitive and self-regulatory skills that may be associated with strategic and purposeful delay behaviors rather than that of procrastination.

Most notably, the Schraw, et al. (2007) participants reported that they were able to achieve peak experience by delaying a task until an optimal level of pressure was reached so that completing the task on time required maximal effort and efficiency. Another method that students used to achieve peak experience was to create a self-induced challenge where they balanced the possibility of failing to complete the task with the excitement of finishing just short of the deadline. This was especially evident when students viewed the task as boring or irrelevant to their personal goals. Finally, the authors concluded that procrastination could increase the likelihood of achieving flow because procrastinators

work under pressure for an extended period of time during which all of their resources are focused on the task at hand.

More recently, an investigation by Seo (2011) looked at the relationships among procrastination, flow, and academic achievement. In this study, 172 Korean undergraduate students answered questions about procrastinating their studying for a recent exam. Participants were asked the date that they began studying for the exam and the date that they intended to start studying for the exam to understand their procrastination in behavior and their procrastination in intention, respectively. Participants also completed an assessment concerning their general procrastination behaviors as well as their perceptions of flow experiences. Finally, participants' examination scores were obtained as an indicator of academic achievement. Results from this investigation revealed that the procrastination and flow variables did not significantly predict academic achievement. However, results indicated that procrastination was positively related to flow and purportedly accounted for approximately 86 percent of the variance in students' reported flow.

While the findings of Miller et al. (2004) Schraw et al. (2007) and Seo (2011) showed that procrastination might actually be conducive of flow experiences for some, subsequent research raises questions about the connection between procrastination and flow. For example, a study by Lee (2005) examined how flow predicted procrastination. In this survey study, 262 Korean undergraduate students completed questionnaires on procrastination, flow, and motivation. It was found that high levels of procrastination were associated with decreased self-determined motivation and low incidences of flow. While it was found that stronger perceptions of flow predicted less procrastination, the study did not look at how procrastination might be predictive of flow. Certainly, flow and procrastination are incompatible because if one is experiencing flow then it makes sense

that one would be deeply engaged in the activity and not procrastinating. While Lee showed that procrastination and flow are significantly and inversely related, it is still unclear if one might be more likely to experience flow after delaying or procrastinating to the point that it made the task optimally challenging.

In yet another study, Mortensen and Miller (2012) asked 224 undergraduate students in a college of education to think of a recent academic assignment (e.g., project or paper) in which they had at least four weeks to complete. While keeping this task in mind, participants completed the Active Procrastination Scale (APS; Choi & Moran, 2009); a measure of procrastination behaviors (Irrational Procrastination Scale); a measure of flow (Flow State Scale, Jackson & Marsh, 1996); the Self-efficacy for Self-regulated Learning Questionnaire (Zimmerman, Bandura, & Martinez-Pons 1992); and a measure of perceived instrumentality for the task (Miller, DeBacker, & Greene, 1999). Consistent with the findings of Lee (2005), procrastination was significantly and negatively related to flow. However, the APS showed a significant positive relationship with flow. Finally, results indicated that participants who perceived the task as instrumental to the attainment of a future goal, reported less procrastination, more active procrastination behaviors, and were more likely to experience the characteristics of flow.

Self-regulated Delay

Park and Sperling (2012) conducted a mixed-methods investigation to understand the motives and reasons for academic procrastination from a self-regulated learning perspective. In the study, 41 undergraduate students were recruited from an introductory general education course. Participants completed several surveys concerning their procrastination, self-regulation, and motivation, and then participated in semi-structured interviews. The researchers were interested in exploring self-regulatory differences between

high and low procrastinators, and based on previous findings concerning the adaptive characteristics of procrastination (Chu & Choi, 2005; Schraw et al., 2007), the researchers wanted to determine whether students considered intentional delays to be procrastination and whether students intentionally "procrastinate" as a means of improving academic performance.

Findings from the study by Park and Sperling (2012) indicated that procrastination was related to poor self-regulatory skills (e.g., poor time management, lacking metacognitive skills, low self-efficacy, performance avoidant goals) and self-handicapping. Furthermore, it was found that most procrastinators did not plan to procrastinate and were more likely to view academic assignments as having low intrinsic interest. Interestingly, procrastinators often reported they worked better under pressure, yet acknowledged that their academic achievement was negatively impacted by their procrastination. Consistent with the findings of Schraw et al. (2007) regarding cognitive efficiency and peak experience, procrastinators reported that procrastination helped motivate them into action and led to deeper concentration. For the participants in this study, "working better under pressure" did not lead to better academic performance, but rather indicated increased focus. Furthermore, in contrast to Schraw et al.'s (2007) findings, with the exception of one of the 21 procrastinators, none of the participants reported intentionally procrastinating. Thus, the purported benefits of procrastination resulted from its consequences of needing to address a task rather than a motive for intentionally engaging in such behavior.

According to Park and Sperling (2012), the one procrastinator who reported intentionally procrastinating, exhibited characteristics consistent with that of active procrastinators (Choi & Moran, 2009; Chu & Choi, 2005) and did not view her procrastination as negative, but rather used procrastination as part of a prioritizing process.

Similar to Schraw et al.'s (2007) notion of cognitive efficiency, she also reported that she used procrastination as a purposeful strategy to work more efficiently. However, her score on the Procrastination Assessment Scale for Students (PASS; Solomon & Rothblum, 1994) classified her as a high procrastinator. This finding is puzzling because active procrastinators are reported to have different characteristics than typical procrastinators and active procrastination and procrastination has been shown to have an inverse relationship (Corkin et al., 2011; Mortensen & Miller, 2012). Thus it remains unclear if the participant did in fact intentionally procrastinate or if she may have displayed stronger defensive mechanisms to justify her procrastination (Park & Sperling, 2012).

Since procrastination is often characterized as self-regulatory failure (Lay & Schouwenburg, 1993; Pychyl & Flett, 2012; Steel, 2007; Tice & Baumeister, 1997), Corkin et al. (2011) contend that Chu and Choi's (2005) and Choi and Moran's (2009) conceptualization of active procrastination was not actually procrastination, but rather an active task delay behavior that could be better understood in terms of a self-regulated learning perspective. In their study, Corkin et al. (2011) tested the relationships between aspects of self-regulated learning (e.g., achievement goals, cognitive/metacognitive strategies usage, and self-efficacy) and active procrastination to see if it differed from traditional measures of procrastination. To do this, the authors administered an online survey to 206 college students. The survey consisted of several existing measures including the 16-item APS (APS; Choi & Moran, 2009). Results from the study by Corkin et al. (2011) revealed that procrastination and active procrastination were inversely related. Additionally, it was found that procrastination and self-regulatory processes were negatively related, yet active procrastination and certain self-regulatory processes (i.e., self-efficacy) were positively related.

Consistent with the findings of Corkin et al. (2011), Mortensen and Miller (2012) also found a significant inverse relationship between procrastination and active procrastination, thereby suggesting that the APS might not actually be measuring procrastination. Given that the active procrastination construct (Choi & Moran, 2009) seems to measure a unique self-regulated delay behavior, Mortensen and Miller (2012) predicted that the APS items and the Self-efficacy for Self-regulatory Learning Questionnaire items would correlate positively. The inter-item correlations revealed mostly positive and significant relationships. However, there was a unique pattern of significant inverse correlations between items on the intentional decision to procrastinate subscale and items from the other three subscales. This is an important finding because it may suggest that students who deliberately delay a task because of other task priorities and time constraints may not perceive their delay as procrastination, but rather a deliberate delay that is part of an overarching self-regulatory scheme.

Furthermore, Choi and Moran (2009) conducted a factor analysis on the items of the APS and found that each of the four subscales produced four unique factors. Mortensen and Miller (2012) attempted to reproduce the factor structure and found that all items with exception to the intentional decision to procrastinate items, loaded strongly on a single factor. It may be important to note that all of the items with exception to the items on the intentional decision to procrastinate subscale were comprised of reverse coded items. Reverse coded items are sometimes used to prevent response sets in large questionnaires. However, reverse coded items have been shown to produce unexpected factor structures (Netemeyer, Bearden, & Sharma, 2003) and can be more confusing because respondents may misinterpret the double-negative wording (Conrad et al., 2004; Duke et al., 2006; Netemeyer et al., 2003; Nunnally 1978; Rodebaugh et al., 2004; Swain,

2008; Weeks et al., 2005). In short, using reverse coded items to measure self-regulated delay behaviors may produce less reliable and more spurious findings, and consequently, will likely inhibit developing a better understanding of the self-regulated delay construct. Therefore, it is necessary to design a scale that more directly measures the characteristics of self-regulated delay.

The Present Investigation

In summary, the research findings concerning positive or adaptive forms of procrastination are mixed. Recent research (Corkin et al., 2011; Mortensen & Miller, 2012; Simpson & Pychyl, 2009; Steel, 2010) seems to disconfirm previous hypotheses about the existence of arousal-based (Ferrari, 1992), adaptive (Schraw et al., 2007), and active (Choi & Moran, 2009; Chu & Choi, 2005) forms of procrastination. The findings of Corkin et al. (2011) as well as Mortensen and Miller (2012) have shown that active procrastination and procrastination are unrelated and have suggested that the construct of active procrastination is actually a unique delay behavior—"active delay" (Corkin et al., 2011) or "self-regulated delay" (Mortensen & Miller) that is governed by students' self-regulatory processes that include self-efficacy (Corkin et al., 2011), achievement goals (e.g., mastery approach) and the perception of the instrumental value of tasks to attaining future goals (Mortensen & Miller, 2012).

The findings of Mortensen and Miller (2012) demonstrated positive relationships between perceived instrumentality, self-regulated delay, and flow, but a negative relationship between procrastination and flow. However, contrary to one of Corkin et al.'s (2011) hypotheses, they failed to find a relationship between active delay (i.e., active procrastination) and learning strategy usage. Given the lack of relation between learning strategy use and active delay, the authors questioned whether active delay could be

considered an adaptive approach to learning. Previous research has shown that students' choice of cognitive strategies was influenced by their motivation to learn (Greene, Miller, Crowson, Duke, & Acky, 2004). In particular, three motivational factors have been related to cognitive strategy use in learning situations: (a) self-efficacy (Bandura, 1986; Bandura, 1997); (b) achievement goals (e.g., Dweck, 1986; Elliot, 1999); and (c) perceived instrumentality (Miller & Brickman, 2004). In their study, Corkin et al. investigated how self-efficacy, achievement goals, and learning strategies predicted active delay and procrastination, but neglected perceived instrumentality—a variable that has shown to predict both self-regulated delay and flow (Mortensen & Miller, 2012). Consequently, it is hypothesized that perceived instrumentality is a central component to the notion of self-regulated delay that has yet to be investigated. Therefore, the purpose of the present study is to examine intentional delay behaviors from a self-regulated learning perspective (Pintrich, 2000; Zimmerman, 2008) and is described in further detail below.

Self-regulated Learning Perspectives

Since procrastination and delay involves various affective, cognitive, motivational, and behavioral components (Fee & Tangney, 2000), the present investigation employs a self-regulated learning perspective (Pintrich, 2000; Zimmerman, 2008) to examine characteristics of self-regulated delayers in comparison with procrastinators and non-procrastinators. A self-regulated learning perspective was selected because it focuses on the cognitive, motivational, and behavioral processes of student learning (Pintrich, 2000), and provides a theoretical framework to examine the cognitive, motivational, behavioral, and contextual characteristics among different types of delayers.

A number of different models of self-regulated learning have been proposed (e.g., Bandura, 1986; Pintrich, 2000; Winne & Hadwin, 1998; Zimmerman, 1998, 2000, 2008).

Each model shares some general features by examining how various cognitive, motivational, and contextual processes influence learning. A brief summary of three prominent models is described below.

Grounded in cognitive psychology, Winne and Hadwin (1998) proposed a four-stage information-processing model of self-regulated learning that focused on learner's cognitive and metacognitive processes in regulating learning. The four phases include task perception, goal setting and planning, enacting, and adaption. In the task perception stage, learners gather information about the task at hand. Next, depending on how learners perceive the task, learners set goals and develop a plan how to accomplish them. Then, learners will enact the plan they developed by using their cognitive and metacognitive skills. Finally, learners evaluate their performance to determine if modifications need to be made to their goals, or they make plans for higher achievement in future performances.

According to Bandura (1986), self-regulation involves three processes: (a) self-observation, (b) self-evaluation, and (c) self-reaction. The three components rely on a *target goal* (Harackiewicz & Sansone, 1991, 2000)—the cognitive representation of a particular behavior that one desires to produce. The target goal serves three primary functions: (a) it defines the desired performance; (b) it highlights the important aspects of the performance that need to be monitored; and (c) it serves as the criterion for self-evaluating one's performance (Bandura, 1986, 1991, 1993).

Based on Bandura's (1986) social-cognitive perspective, Zimmerman (1998, 2000) proposed a model that focused on the motivational and social aspects of self-regulated learning. Zimmerman's (2000) model suggested that self-regulated learning involves feedback loops in three cyclical phases: forethought, performance control, and self-reflection. The forethought phase involves task analysis and self-motivational beliefs. Task

analysis involves setting goals and strategically planning how to achieve the goals. The goal systems of highly self-regulated learners are organized hierarchically, with the setting of proximal goals that lead to the attainment of more distal goals. For example, a highly regulated learner often sets proximal sub-goals that incrementally lead to the attainment of more distal, personally valued goals. Self-motivation beliefs include learners' self-efficacy, outcome expectations, intrinsic interest, and goal orientation, and will be described in further detail below.

The performance phase involves self-control and self-observation. Self-control processes include task strategies to help learners focus on the task and optimize effort. Furthermore, highly self-regulated learners employ a variety of strategies to improve their attention, such as structuring their environment to eliminate distractions. Self-observation processes involve monitoring one's own performance and using self-feedback to improve one's performance (Zimmerman, 2000).

The self-reflection phase involves self-judgment and self-reaction. Self-judgment processes include self-evaluation of one's performance and making attributions in accordance with the results. Self-evaluation includes comparing one's performance to the set goal. The self-reflections then influence forethought of future performances to complete the self-regulatory cycle. In summary, Zimmerman's (2000) model highlights the importance of the interactions between cognitive and motivational processes for recurring learning experiences.

Building on these previous models of self-regulated learning, Pintrich (2000) proposed a framework for classifying four different phases and four different areas for regulation into a 4 x 4 model. The first phase involves forethought, planning, and goal setting. The second phase involves metacognitive awareness and monitoring. The third

phase involves controlling and regulating oneself, the task, and the context. The fourth phase involves reactions and reflections of oneself, the task, and the context. The four areas for regulation include: cognition, motivation, behavior, and context. Unlike previous models, Pintrich's model includes learners' self-regulation of the task environment where the learning is taking place. The context is an important aspect of self-regulated learning because depending on the features of a given task, learners will attempt to monitor, control, and regulate the context.

Pintrich's (2000) framework was selected for the present study because it is a comprehensive model of self-regulated learning that takes into consideration the various phases and areas of self-regulated learning. Furthermore, Pintrich's model can help explain the different types of self-regulatory strategies college students might use to control their cognition, motivation, behavior, and context. For example, depending on a student's cognitive abilities and motivational characteristics, in conjunction with the contextual features of a given task, students' may approach academic tasks in a variety of ways that may include intentionally delaying a task, procrastinating a task, or not delaying the task, among many other approaches to learning. Thus, using Pintrich's framework in conjunction with a newly developed scale of self-regulation designed specifically for complex tasks executed over time, in contexts involving multiple other tasks, the present investigation sought to determine how self-regulated delayers, procrastinators, and non-procrastinators differed in terms of their self-regulatory skills, motivational characteristics, and behavioral outcomes.

Self-efficacy

The present study focused on three motivation variables associated with self-regulated learners: self-efficacy, achievement goals, and perceptions of instrumentality.

According to Bandura's (1986) social-cognitive theory, behaviors are performed to obtain valued outcomes or avoid undesirable ones. These *outcome expectations* serve as incentives for action by guiding choice of actions as well as effort and persistence directed at attaining outcomes. Self-efficacy refers to a learner's judgment and confidence about being able to perform effectively and achieve success (Bandura, 1986; 1997; Pajares, 1996). Taken together, the greater the personal value of the outcome expectations and the stronger the self-efficacy beliefs that one is capable of producing the behaviors necessary to achieve the desired outcomes, the greater the likelihood that one will put forth effort and persist through difficulties to obtain the desired outcomes. Research has suggested that self-efficacy plays an important role in task initiation and persistence (Bandura, 1997; Pintrich, 2000; Schraw et al., 2007; Schunk & Pajares, 2005). However, for desired outcomes to influence behavior, they must be incorporated into one's self-regulatory system (Bandura, 1986). For example, simply wanting to earn a high-grade does not alone produce the necessary actions to obtain the high-grade. Rather, the student must regulate their cognition, motivations, and behaviors in pursuance of such outcomes.

People who expect failure will tend to have low self-efficacy for the task and will likely avoid the task altogether or may engage in ego-protective, self-handicapping strategies such as procrastination (Chu & Choi, 2005; Ferrari, 1992, 1994; Ferrari & Tice, 2000; Wolters, 2004). Self-handicapping is a strategy where people avoid tasks as a way to protect their self-esteem (Jones & Berglas, 1978); that is, they blame failures on external causes (e.g., procrastination) rather than internal causes (e.g., ability) as a way to protect self-esteem. A meta-analytic review by Steel (2007) that included 39 studies and 6,994 participants showed that self-efficacy was inversely correlated with procrastination of (r = -.38). Furthermore, the meta-analytic review that included 16 studies and 2,784 participants

showed that self-handicapping was positively correlated with procrastination of (r = .46) (Steel, 2007).

Ultimately, procrastination has been associated with detrimental performance, and in turn, will likely lower one's self-efficacy and lead to continued procrastination (Steel, 2007). On the other hand, it has been shown that students who were confident about their abilities (i.e., have high self-efficacy) tended to not to procrastinate (Corkin et al., 2011; Steel, 2007; Wolters, 2003). Indeed Corkin et al. (2011) found that active procrastination (i.e., active delay) was positively correlated with self-efficacy, further suggesting that active procrastination is not procrastination, but a unique delay behavior that is guided students' self-regulatory skills that includes high self-efficacy. Finally, self-efficacy beliefs have been shown to influence goal setting and highly efficacious learners tend to remain more committed to attaining one's goals (Zimmerman, 2000).

Achievement Goals

According to Bandura's (1986) social-cognitive theory, most human behavior is goal directed. The self-regulatory processes of (a) self-observation, (b) self-evaluation, and (c) self-reaction affect the pursuance of goals (Bandura, 1986). Therefore, goals are central to self-regulatory processes (Miller & Brickman, 2004). Achievement goals represent different reasons for engaging in tasks. Goals direct cognition, learning, and behavior and determine how people approach or avoid tasks (Ames, 1984; Dweck & Leggett, 1988; Elliot & Dweck, 2007; Pintrich, 2000).

Early research distinguished between mastery or learning goals and performance goals (Dweck, 1986). People with mastery or learning goals are concerned with their own learning and developing competence, skills, or knowledge, whereas people with performance goals are concerned with demonstrating their competence or want to avoid

appearing incompetent. The mastery-performance dichotomy has since developed to include approach and avoidance valences.

Elliot and McGregor's (2001) achievement goal framework describes four goal orientations that include mastery-approach, performance-approach, mastery-avoidance, and performance-avoidance. People with mastery-approach goals are focused on improving their ability or learning by developing a thorough understanding. People with mastery-avoidance goals are focused on avoiding failure to learn what they desire to learn (Elliot & Harackiewicz, 1996; Pintrich, 2000). People with performance-approach goals focus on doing better than others and are concerned with demonstrating their abilities to others (Ames & Archer, 1988; Dweck, 1992; Moller & Elliot, 2006). People with performance-avoidance goals have a desire to avoid demonstrating a lack of competence to others (McGregor & Elliot, 2002; Midgley, Kaplan, & Middleton, 2001).

Research has shown that people who set clear and specific goals have higher levels of achievement and satisfaction than people who have vague goals (Bandura, 1986, 1991, 1993; Locke & Latham, 1990; Schunk, 1990, 1994; Zimmerman, 1989). Mortensen and Miller (2012) revealed that procrastination is associated with unclear goals (r = -.43). Several studies have shown that mastery-approach orientations are inversely related to self-handicapping (Midgley, Anmkamar, & Urdan, 1996; Midgley & Urdan, 2001; Pintrich, 2000) and procrastination (Corkin et al., 2011; Howell & Watson, 2007; Mortensen & Miller, 2012; Wolters, 2003, 2004). On the other hand, performance-approach goals have been positively correlated with self-handicapping (Ommundsen, 2001; Rhodewalt, 1994) and procrastination (Wolters, 2003). Since many people procrastinate to avoid aversive tasks, procrastination has been shown to positively correlate with performance-avoidance

goals (Elliot & McGregor, 2001; Mortensen & Miller, 2012) and mastery-avoidant orientations (Corkin et al.; Howell & Watson, 2007; Mortensen & Miller, 2012).

Choi & Moran (2009) suggested that self-regulatory processes drive active procrastination, where some intentionally procrastinate because they prefer time-pressure and are motivated by an intrinsic need to deal with challenge of the task and by the external demands to complete the task on time. Furthermore, active-procrastinators were reportedly satisfied with the outcomes of their performance (Choi & Moran 2009; Chu & Choi, 2005). While achievement goals were not examined in their studies, based upon the defining characteristics, it would seem that active procrastinators are driven by performance-oriented outcomes. Corkin et al. (2011) looked at the achievement goals of active delayers (i.e., active procrastinators) and found that mastery-approach, mastery-avoidance, and performance-avoidance goals were all significant negative predictors. On the other hand, Mortensen and Miller (2012) found that mastery-approach was a significant positive predictor and mastery-avoidance was a significant negative predictor of self-regulated delay (i.e., active procrastination). Since previous research has shown that mastery-approach goals are positively associated with adaptive self-regulatory processes (Moller & Elliot, 2006) as well as metacognitive strategies usage (Howell & Watson, 2007) it is expected that there should be a positive relationship between self-regulated delay and mastery-approach goals. In short, the present study builds on previous research findings to re-examine and confirm the hypothesized relationships between goal orientations and different types of delay behaviors—self-regulated delay and procrastination. Based upon previous research findings, it is expected that self-regulated delayers will report mastery-approach orientations, whereas procrastinators will report both mastery-avoidance and performance-avoidance orientations.

Future Goals and Perceived Instrumentality

Similar to achievement goals, personally valued future goals are an important aspect of self-regulated learning. Bandura (1986) noted the importance of both proximal (e.g., achievement goals) and distal goals (e.g., future utility goals) in human motivation. However, the goals referred to in the social-cognitive model of self-regulation are proximal in nature (Bandura, 1986; Locke & Latham, 1990). Therefore, Miller and Brickman (2004) developed a model of future-oriented motivation and self-regulation that was based on Bandura's social-cognitive theory (1986) as well as the research and theory of future oriented goals (e.g., Markus & Nurius, 1986; Nuttin, 1984, 1985; Raynor, 1974). Their model reflects the factors and interrelationships between future-oriented regulation and proximal self-regulation processes that influence self-regulated learning. The future goals described in the Miller and Brickman model are self-relevant and self-defining goals, and are what Ryan and Deci (2000) refer to as self-determined goals. Similar to achievement goals, personally valued future goals provide incentive for action.

While the incentive value for personally valued future goals is distant, when self-regulated learners first develop a personally valued future goal, they create a system proximal sub-goals or targets that incrementally lead to the distant, personally valued future goal (Bandura, 1986; Miller & Brickman, 2004). When the proximal sub-goals are accomplished, the commitments to future goals grow stronger (Markus & Ruvolo, 1989). The process of adopting personally valued future goals and the creation of a system of proximal goals depends on a person's knowledge of the goal itself, knowledge of the possibilities within the sociocultural context, and the general and task-specific problem solving strategies and learning strategies (Cantor, & Kihlstrom, 1987; Miller & Brickman, 2004; Nurmi, 1991). Moreover, people who lack relevant socio-cultural knowledge or the

cognitive strategies for learning and problem solving may fail to self-regulate and fail to develop a system of proximal sub-goals for their personally valued future goals (Miller & Brickman, 2004). Consequently, such people might have an increased likelihood of procrastinating because they are unsure of how to start or do not see proximal tasks (e.g., schoolwork) as instrumental to the attainment of a future goal (e.g., graduating and developing a career). In short, "It is the system of subgoals that makes self-regulation possible in the pursuit of distant future goals" (Miller & Brickman, 2004, p. 16).

After identifying the personally valued future goal and generating the system of proximal sub-goals, a person can then engage in the task and employ the self-regulatory processes of self-observation, self-evaluation, and self-reaction that are necessary for attaining the future goal (Miller & Brickman, 2004). Proximal self-regulation is then guided by the outcome expectations (e.g., improved understanding) and the self-reactions that follow performance (e.g., satisfaction). Miller and Brickman (2004) believe that perceptions of instrumentality are essential to the self-regulatory process in using proximal sub-goals to achieve personally valued future goals. For example, when schoolwork is not perceived as instrumental to personally valued future goals, then its incentive value results solely from the task itself. Consequently, the student's self-evaluative reactions are focused on performance (e.g., receiving praise or avoiding punishment; looking competent or avoid looking incompetent; and outperforming others) rather than making progress towards the personally valued future goal. On the other hand, when schoolwork is perceived as instrumental to attaining a personally valued future goal, the student's self-evaluative reactions are focused on learning, improvement, and making progress towards the personally valued future goal.

Research has shown positive relationships between perceptions of instrumentality and the incentive value of academic tasks. Miller et al. (1999) found that perceived instrumentality was positively correlated with students intrinsic and extrinsic valuing of academic tasks. Mortensen and Miller (2012) found that perceptions of instrumentality for an academic task positively predicted flow experiences—a form of intrinsic motivation (β = .26).

Miller et al. (1996) and Brickman and Miller (1998) found that perceptions of instrumentality were positively related with the usage of self-regulatory strategies, deep-processing study strategies, effort, and persistence. Additionally, Mortensen and Miller (2012) found that the perceptions of instrumentality positively predicted self-regulated delay (β = .17)—a unique delay behavior that was guided by students' self-regulatory skills. However, when students do not perceive learning tasks as instrumental to personally valued future goals, incentives for task engagement may not be activated and the usage of self-regulatory strategies may be hindered (Miller & Brickman, 2004). Consequently, students who do not perceive academic tasks as relevant to the achievement of a personally valued future goal may be more likely to procrastinate due to the lack of incentive for task engagement. Indeed, as indicated by an inverse relationship between perceived instrumentality and procrastination, Mortensen & Miller (2012) found that students who reported lower perceptions of instrumentality for the academic task also reported more procrastination (β = -.16). Furthermore, other research has shown that procrastinators found distant tasks less motivating and of less value (Pintrich, 2000; Schraw et al., 2007; Steel, 2007). Research has also shown that procrastinators are less likely to develop a systematic and disciplined approach (e.g., system of proximal sub-goals) for academic tasks

and less likely to select effective strategies requiring time and effort to develop (Howell & Watson, 2007; Schouwenburg, 2004; Steel, 2007; Wolters, 2003, 2004).

In short, future outcome expectancies play an important role in self-regulated learning. Future goals influence self-regulation through the creation of a system of proximal sub-goals that serve as stepping-stones that lead to future goal attainment. Furthermore, future goals add to the incentive value for engaging and accomplishing proximal tasks and influence more mastery-oriented rather than performance-oriented proximal self-evaluative reactions of progress towards the future goal. Therefore, the present study examined the relationships between perceptions of instrumentality for academic tasks and different types of delay behaviors—self-regulated delay and procrastination. Certainly, perceived instrumentality plays an important role in self-regulation and needs to be further understood in how it influences how students approach or avoid academic tasks in relationship to the delay behaviors in which students engage. Based upon previous research findings, it is expected that self-regulated delayers will report stronger perceptions of instrumentality because they see academic assignments as proximal sub-goals that lead to the attainment of future goals, whereas procrastinators will report lower perceptions of instrumentality because they are unlikely to see the relevance of their academic assignments and will fail to act in a timely manner and fail to establish a system of proximal-subgoals.

Research Purpose

In summary, the purpose of the investigation was to examine the notion that active procrastination (Choi & Moran, 2009; Chu & Choi, 2005) is not a positive type of procrastination, but a unique delay behavior that is guided by students' self-regulatory skills (e.g., prioritizing, time-management, and self monitoring) and motivational characteristics

(e.g., self-efficacy, achievement goals, and perceptions of instrumentality). To accomplish this purpose, the investigation tested a new measure of self-regulation for complex academic tasks to demonstrate that characteristics of active procrastination as measured by the Active Procrastination Scale are actually related to self-regulation rather than procrastination. The development and preliminary testing of this new scale will be described fully in the Methodology.

In addition to testing the newly developed scale of self-regulation, the present study also examined how students approach academic assignments from a self-regulated learning perspective (Pintrich, 2000; Zimmerman, 2008) to better understand the cognitive, motivational, and behavioral characteristics of students who engage in different delay behaviors, or no delay at all. Specifically, the following research questions and hypotheses were tested to examine differences in cognition, metacognition, and self-regulatory skills (prioritizing, time-management, self-monitoring), motivation (self-efficacy, achievement goals, and perceptions of instrumentality), and behavior (task performance, level of procrastination, and perceptions of flow), among students who engage in different types of delay or no delay at all (i.e., no-delay, intentional delay, and non-intentional delay).

Research Questions

1. Do scores on the Self-regulation for Complex Academic Tasks Scale (S-RCATS) correlate with the following antecedents of self-regulation and outcome of task performance as predicted? If the S-RCATS is valid the following predictions should be supported:
    a. positively with self-efficacy
    b. achievement goals
        i. positively with mastery approach goals
        ii. negatively with mastery avoidance goals
        iii. neutral with performance approach goals
        iv. negatively with performance avoidance goals
    c. positively with perceived instrumentality
    d. positively with flow
    e. positively with task performance (i.e., grade)
2. Is the Self-regulation for Complex Academic Tasks Scale (S-RCATS) related to the following scales as predicted?

    Predictions:

    a. The S-RCATS will be positively related to the APS subscales: outcome satisfaction, preference for pressure, and ability to meet deadlines (Choi & Moran, 2009).
    b. The S-RCATS will be positively related to the APS subscales: outcome satisfaction, preference for pressure, and ability to meet deadlines (Choi & Moran, 2009).

c. The S-RCATS will be negatively related to the Intentional Decision to Procrastinate subscale of the APS (Choi & Moran, 2009)?

d. The S-RCATS will be negatively related to the Irrational Procrastination Scale (Steel, 2010).

3. Do the items on the Self-regulation for Complex Academic Tasks Scale (S-RCATS), the Active Procrastination Scale (APS), and the Irrational Procrastination Scale (IPS) relate as predicted?

   Predictions:

   a. The items from the three subscales of the S-RCATS (prioritizing, time-management, self-monitoring) and the items from three subscales of the APS (outcome satisfaction, preference for pressure, and ability to meet deadlines) will load positively on a single factor.

   b. The items from the three subscales of the S-RCATS (prioritizing, time-management, self-monitoring) and the items on the Intentional Decision to Procrastinate subscale of the APS will load on separate factors.

   c. The items from the three subscales of the S-RCATS (prioritizing, time-management, self-monitoring) and the items from the IPS will load on separate factors.

4. How do students who engage in different types of delay (i.e., no-delay, intentional delay, or non-intentional delay) differ in terms of their cognition, motivation, and behavior?

   The predictions are summarized in Table 1.

Table 1

Cognitive, Motivational, and Behavioral Predictions for Type of Delay

Dependent Measure	Intentional Delayers	Non-intentional Delayers	Non-delayers
Self-regulation			
Prioritizing	Low	Low	High
Time Management	Low	Low	High
Self Monitoring	Low	Low	High
Motivation			
Self-efficacy	Middle	Low	Middle
Mastery Approach	Low/Middle	Low	Middle
Mastery Avoidance	Low?	High	Low?
Performance Approach	High	High	Middle
Performance Avoidance	Middle/High	High	Middle
Perceived Instrumentality	Low	Low	Middle
Behavior			
Grade Received	Low	Low	High
Irrational Procrastination	High	High	Low
Flow	Low/Middle	Low	Middle

Chapter 3:

Methodology

Participants

The participants were 326 undergraduate students who were recruited from various colleges and disciplines at three universities in the central and eastern United States. Participants were recruited in person and by email from three educational psychology courses, an introductory meteorology course, two introductory journalism courses, an introductory visual communications course, a construction science course, and five freshman orientation courses. The sample was 76% female and 24% male, with an average age of 20 years, and generally average academic profiles, as evidenced by GPA (M = 3.45; SD = .46). Participants were 38% Freshman, 27% Sophomore, 23% Junior, and 12% Senior. See Table 2 for a complete list of demographic characteristics.

Table 2

Demographic Characteristics

		Frequency	Percent
Gender			
	Males	77	23.6
	Females	249	76.4
Ethnicity			
	White	269	82.5
	African American/Black	20	6.1
	Hispanic	13	4.0
	Other	9	2.8
	Asian	7	2.1
	American Indian	5	1.5
	Hawaiian	3	.9
Class Standing			
	Freshman	123	37.7
	Sophomore	89	27.3
	Junior	75	23.0
	Senior	39	12.0

Measures and Variables

For the investigation, several existing measures with demonstrated validity and reliability were used. The items from each of the existing scales were written in the past tense so that respondents were able to evaluate the items based upon a recent academic task that participants were asked to consider. The response format for the items in the present study employed five-point Likert scales that ranged from "strongly disagree" to "strongly agree." Goal orientations were measured using the 12-item Achievement Goal Questionnaire (Elliot & McGregor, 2001) (see Appendix A). Perceived instrumentality was measured using a five-item subscale from the Approaches to Learning Survey (Miller, DeBacker, & Greene, 1999) (see Appendix C). Perceptions of flow was measured using the 36-item Flow State Scale (Jackson & Marsh, 1996) that consists of nine subscales that measure the dimensions of flow including: challenge-skill balance, action-awareness-merging, clear goals, unambiguous feedback, concentration of task at hand, sense of control, loss of self-consciousness, transformation of time, and autotelic experience (see Appendix D). Procrastination was measured using the 9-item Irrational Procrastination Scale (IPS; Steel, 2010) (see Appendix F). The Active Procrastination Scale (APS; Choi & Moran, 2009) is a 16-item questionnaire designed to measure the four aspects of active procrastinators: outcome satisfaction, preference for time pressure, intentional decision-making, and ability to meet deadlines (see Appendix G). With exception to the performance-avoidant subscale of the achievement goal questionnaire, all other scales demonstrated good internal consistency with alpha coefficients that exceeded .75. Descriptive statistics and alpha coefficients for all measures used in the current study are presented in *Table 3*.

Table 3

Scales and Reliabilities

Scale	Cronbach's Alpha	Mean	SD
Flow State Scale	.94	3.39	.60
Self-regulation Scale for Complex Tasks	.92	3.82	.54
Prioritizing	.80	3.89	.62
Time Management	.75	3.58	.68
Self-monitoring	.84	3.92	.55
Irrational Procrastination Scale	.87	3.00	1.08
Active Procrastination Scale	.75	3.41	.52
Outcome Satisfaction	.76	3.75	.89
Preference for Time Pressure	.87	3.85	1.02
Intentional Decision to Procrastinate	.87	2.38	1.08
Ability to Meet Deadlines	.86	3.99	.97
Perceived Instrumentality Scale	.90	3.40	1.01
Self-efficacy	.81	84.18	15.56
Performance Approach Goals	.85	3.40	1.08
Performance Avoidance Goals	.68	3.77	.94
Mastery Avoidance Goals	.80	2.71	1.03
Mastery Approach Goals	.82	3.64	.94

In addition to the existing measures, two new scales were used, one measuring self-efficacy, and the other self-regulation designed specifically for complex tasks executed over time, in contexts involving multiple other tasks. Self-efficacy was measured using a four-item scale that assesses participants' confidence in being able to complete and manage their time for the task that they have in mind (see Appendix I). Since previous research (see Mortensen & Miller, 2012) has shown that the items on three of the active procrastination subscales—outcome satisfaction, preference for pressure, and ability to meet deadlines—are related to self-regulatory skills as measured by the self-efficacy for self-regulated learning questionnaire (Zimmerman, Bandura, & Martinez-Pons, 1992) a new 23-item Self-regulation for Complex Academic Tasks Scale (S-RCATS) was developed. Due to concerns with the use of reverse coded items on three of the four active procrastination subscales, it is believed that the new self-regulation scale more directly captures the defining

characteristics of self-regulated delay. The S-RCATS was developed and tested in a previous study using undergraduate students in a college of education and is described in further detail below.

The items for the S-RCATS were developed according to the defining characteristics that are believed to underlie the three primary dimensions of self-regulatory skills that are involved in working on complex academic assignments (i.e., prioritizing, time management, self-monitoring/metacognitive awareness). The prioritizing dimension included 8 items; time management included 7 items; and self-monitoring/metacognitive awareness included 10 items. In an earlier pilot study, the original 25-item scale was tested using 176 undergraduate students. Inter-item correlations revealed mostly positive and significant relationships. However, one reverse-coded item, "I underestimated the time that it would take to accomplish the task," showed mostly negative and non-significant relationships to the other items.

An exploratory principal components factory analysis with all 25 items generated five factors with eigenvalues ranging from 1.1 to 9.8. The scree plot suggested a two-factor solution. A second exploratory factor analysis of the 25 items was conducted by forcing a two-factor solution using principal components analysis. The two-factor solution explained 39% of the total item variance. Two items did not load strongly on either factor and all four items that comprised the second factor were more strongly loaded on the first factor. A parallel analysis revealed the 95th percentile eigenvalue (of 1.71) for the second factor from the randomly generated dataset was only slightly lower than its corresponding eigenvalue (of 1.77) for the second factor from the raw data. Together, the parallel analysis and the cross-loadings suggested a one-factor solution was more appropriate. Therefore, the 25-items were subjected to a one-factor solution and all but two items loaded strongly

on the single factor. The two items that did not load on the factor were removed and a new 23-item scale was created (see Appendix H). The prioritizing dimension included 7 items (1-item removed); time management included 6 items (1-item removed); and self-monitoring/metacognitive awareness included 10 items (no items removed). The resultant 23-item scale and the three individual sub-scales had very good internal consistency with alpha coefficients above .80.

Procedures

Participants completed all procedures on online via a survey that was created using Qualtrics. Participants accessed the online survey by entering the website address provided to them or by clicking on a hyperlink that was emailed to them. After reading the information sheet for informed consent, participants who agreed to participate were given the opportunity to continue with the survey. First, participants completed a series of demographic questions concerning their (a) age, (b) gender, (c) ethnicity, (d) class standing, (e) discipline of study, and (f) estimated grade point average. Next participants were asked to take a few moments to think of a recent project or paper that was assigned in one of their courses. Participants were asked a series of questions about the task that they have in mind including, (a) type (project, paper, or other); (b) the course of the assigned task (major, general, or elective); (c) how well they did on the assignment; (d) the grade the received on the assignment; (e) the name of the course; and (f) their overall grade in the course. Next participants were asked to rate the challenge of the task on a five-point Likert scale ranging from "not at all challenging" to "very challenging." Participants were also asked: "How many days before the due date did you actually begin working on the project or paper?" and "How many days before the due date did you plan to begin working on the project or paper?" Participants were asked whether or not they delayed starting the task. If

participants reported "yes", they were asked to provide reasons as to why they delayed the task and were asked if they *intentionally* delayed the task. If participants reported that they did not delay the task, they were asked to provide reasons for why they did not delay the task. Participants were asked to keep the specific task in mind while completing several questionnaires concerning their (a) achievement goals, (b) perceptions of instrumentality, (c) self-efficacy, (d) self-regulation for complex academic tasks, (e) flow, (f) active procrastination, and (g) procrastination. The survey concluded with a debriefing page and participants were thanked for their participation.

Chapter 4:

Results

Demographics

Of the 326 participants that completed the survey, 98 (30%) reported that they did not delay the project or paper they had in mind and 228 (70%) reported that they had delayed. Several of the participants who reported delaying, readily admitted that they procrastinated (37, 16%) and a handful insisted that they worked better under pressure (7, 3%). Still, many other participants indicated that they delayed because of other academic tasks and priorities (69, 30%). Some of the other reasons for delaying included: being overwhelmed, anxious, or unsure about how to start (23, 10%); general laziness and a lack of motivation (55, 24%); as well as social distractions that included using social media, watching television, and spending time with friends (19, 8%).

Of those participants who delayed the project or paper, 123 (54%) reported that their delay was intentional. Of those who engaged in an intentional delay, 19 (15%) indicated that they procrastinated and three (2%) reported that they worked better under pressure. Other participants indicated that they intentionally delayed because of other academic priorities and tasks (36, 29%). Some of the other reasons for delaying included: being overwhelmed, anxious, or unsure about how to start (15, 12%); general laziness and a lack of motivation (36, 29%); as well as social distractions that included using social media, watching television, and spending time with friends (10, 8%).

Of those participants who delayed the project or paper, 105 (46%) reported that their delay was not intentional. Of those who engaged in a non-intentional delay, 18 (17%) indicated that they procrastinated and four (4%) reported that they worked better under pressure. Other participants indicated that they intentionally delayed because of other

academic priorities and tasks (33, 31%). Some of the other reasons for delaying included: being overwhelmed, anxious, or unsure about how to start (8, 8%); general laziness and a lack of motivation (19, 8%); as well as social distractions that included using social media, watching television, and spending time with friends (9, 9%).

On the other hand, of those participants that did not report delaying the project or paper, the majority indicated that they did not delay because they knew the project would be challenging or time consuming (23, 7%). Several others noted that they wanted to finish the paper or project quickly because they had other assignments that they needed to complete (19, 6%) or because they were working in a group with other students (15, 5%). Some of the other reasons for not delaying included: a desire to do well or get a good grade (12, 4%); disliking procrastination and working under pressure (8, 2%); and being interested in the class or assignment (5, 2%). The majority of participants reported that they received a grade of "A" on the task they had in mind (222, 68.1%), followed by 69 (21.2%) who received a grade of "B", 11 (3.4%) who received a grade of "C", and 16 (4.9%) who received a grade that was lower than a "C" or was "unsatisfactory."

Research Questions

The present investigation was designed to determine whether the phenomenon of active procrastination (Choi & Moran, 2009; Chu & Choi, 2005) actually involves procrastination or whether it is largely a self-regulation phenomenon. Since it is hypothesized that active procrastination is a self-regulation phenomenon, a new self-regulation scale was developed specifically for complex tasks executed over time because it is believed that this scale would provide greater construct validity evidence for the "intentional delay" aspects of Choi and Moran's (2009) measure of "active procrastination." This was done in two steps. The first step was to determine whether the Self-regulation for

Complex Academic Tasks Scale (S-RCATS) is correlated with other antecedent and outcome variables to support the self-regulatory nature of the new scale. The second step was to test whether the S-RCATS is related to the subscales of the "active procrastination" scale in hypothesized ways using correlation and factor analysis. The first research question addresses how scores on the self-regulation scale relate to several antecedents of self-regulation as well as outcomes of performance. The second and third research questions address how the S-RCATS relates to the four subscales of the APS (Choi & Moran, 2009) and the IPS (Steel, 2010). Finally, the fourth research question seeks to understand the differences between non-delayers, intentional delayers, and non-intentional delayers in terms of their self-regulation, motivation, and behavior.

Research question one: relationship between self-regulation, antecedent, and outcome variables. The first step of the investigation was to determine whether the S-RCATS is correlated with other antecedent and outcome variables to support the self-regulatory nature of the new scale (see Table 4 for the correlation matrix). To address the first part of the first research question, Pearson's bivariate correlations were calculated between the S-RCATS and the following antecedents of self-regulation: self-efficacy, achievement goals, and perceptions of instrumentality. Since self-regulated learners are often confident in their abilities to achieve success outcomes through effort and persistence, it was hypothesized that scores on the self-regulation scale would be positively related to self-efficacy. As expected, scores on the self-regulation scale were positively related to self-efficacy ($r = .488$).

Self-regulated learners tend to be more concerned with learning and mastering the content of their courses rather than trying to avoid misunderstanding, outperforming their peers, or avoiding demonstrating incompetency. Therefore, it was hypothesized that the

scores on the S-RCATS would be positively related to mastery-approach goals, negatively related to mastery-avoidance goals, negatively related to performance-avoidance goals, and somewhat neutral with performance-approach goals because while self-regulated learners want to perform well, performance is a personal quest rather than a socially oriented outcome. As expected, scores on the S-RCATS were positively related with mastery-approach goals (r = .413) and showed a positive yet weak relationship with performance-approach goals (r = .111). While the relationship between scores on the S-RCATS and mastery avoidance goals was in the expected direction (r = -.066), the relationship was weak and not significant. Since the performance avoidance scale was unreliable, it was not surprising that the relationship between S-RCATS and performance-avoidance goals was weak, non-significant, and not in the expected direction (r = .014). Lastly, since self-regulated learners are more likely to understand the utility value of their course work, it was hypothesized that scores on the S-RCATS would be positively related to perceptions of instrumentality, and indeed they were (r = .287).

To address the second part of the first research question, Pearson's bivariate correlations were calculated between the S-RCATS and the following outcomes of task performance: perceptions of flow like experiences and the grades they received on the task. Since previous research has noted the link between self-regulatory characteristics and flow experiences (Schraw et al., 2007), it was hypothesized that the two would be positively correlated. As expected, scores on the S-RCATS were strongly, positively, and significantly related with scores on the Flow State Scale (r = .649). It was also hypothesized that self-regulated learners would achieve better grades than their peers who were less self-regulated. As expected, scores on the S-RCATS were also positively and significantly related to achieving better grades (r = .264).

Table 4

Self-regulation, Motivational Characteristics, and Behavioral Outcomes Correlations

Variables	1	2	3	4	5	6	7	8	9
1. Self-Regulation (S-RCATS)	1								
2. Self-efficacy	.488**	1							
3. Mastery Approach	.413**	.146**	1						
4. Mastery Avoidance	-.066	-.314**	.241**	1					
5. Performance Approach	.111*	.093	.185**	.115*	1				
6. Performance Avoidance	.014	-.035	-.035	.238**	.129*	1			
7. Perceived Instrumentality	.287**	.104	.528**	.125*	.071	-.105	1		
8. Flow	.649**	.420**	.478**	-.116*	.187**	-.050	.409**	1	
9. Grade	.264**	.382**	.103	-.253**	.008	.002	.063	.281**	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Research question two: relationship between self-regulation and active procrastination. Research question two explored the relationship between the S-RCATS, the APS, and the IPS. To address the second research question, Pearson's bivariate correlations were calculated between the S-RCATS and the three subscales of the APS (outcome satisfaction, preference for time pressure, and ability to meet deadlines) that have a hypothesized positive relationship with self-regulation. As expected, the S-RCATS as a whole had moderately strong, positive, and significant relationships to the three scales of the APS: outcome satisfaction ($r = .493$), preference for time pressure ($r = .465$), and ability to meet deadlines ($r = .483$). The three subscales of the S-RCATS (prioritizing, time management, and self-monitoring) also showed moderately strong, positive, and significant relationships to the three scales of the APS that ranged from .386 to .493.

Based on previous research, the intentional decision to procrastinate subscale of the APS appears to be measuring something closer to procrastination rather than self-regulated delay. Therefore, it was expected that the intentional decision to procrastinate

subscale would be negatively related to the S-RCATS. Indeed, the S-RCATS had a moderately strong, negative, and significant relationship to the intentional decision to procrastinate subscale (r = -.315). The three subscales of the S-RCATS as well as the other three subscales of the APS also showed significant negative relationships to the intentional decision to procrastinate subscale that ranged from -.243 to -.606.

Finally, since procrastination is widely considered a behavior that is characterized as an inability to self-regulate, it was hypothesized that the S-RCATS would be negatively correlated with a reliable and valid measure of traditional procrastination (i.e., IPS). As expected, the S-RCATS as a whole had a moderately strong, negative, and significant relationship with the IPS (r = -.477). To provide further support for the concept that active procrastination is better conceptualized as a self-regulatory behavior rather than procrastination, the intentional decision to procrastinate subscale was found to have a large, positive, and significant relationship with irrational procrastination (r = .517).

Research question three: evaluating the self-regulation scale and active procrastination scale. The first part of research question three explored how the items on the new S-RCATS related to the items on the three subscales of the APS that are believed to capture the self-regulatory nature of the scale (outcome satisfaction, preference for time pressure, and ability to meet deadlines). Twelve items from the three APS subscales (outcome satisfaction, preference for time pressure, and ability to meet deadlines) and 23 items from the three subscales of the S-RCATS (prioritizing, time management, and self-monitoring) were subjected to a principal components analysis using SPSS. The correlation matrix revealed several coefficients of .30 and above. The Kaiser-Meyer-Olkin value was .921, exceeding the recommended value of .60 (Tabachnick & Fidell, 2007), and

Bartlett's test of Sphericity was statistically significant, supporting the factorability of the correlation matrix.

The preliminary analysis revealed the presence of six components with eigenvalues that were grater than one, explaining a cumulative variance of 62.84%. The scree plot revealed a clear break after the third component. A parallel analysis also indicated that only three components exceeded the corresponding criterion values for a randomly generated data matrix of the same size (35 variables x 326 participants). The three-component solution explained a total of 51.29% of the variance, with the first component contributing 33.29%, the second component contributing 11.62%, and the third component contributing 6.38%. However, the component matrix indicated that all but one of the items loaded most strongly and positively on the first component. Additionally, the items that loaded on the second and third components yielded cross-loadings with the first component that were either weaker, negative, or both (see Table 5). Since all but one of the items loaded most strongly and positively on the first component, it was determined that a one-component solution would be the most parsimonious in demonstrating that the 12 items from the three APS subscales (outcome satisfaction, preference for time pressure, and ability to meet deadlines) and the 23 items from the three S-RCATS subscales (prioritizing, time management, and self-monitoring), together represented the overarching hypothetical construct of self-regulation.

Therefore, the original 35 items were subjected to another principal components analysis that forced a single factor solution. As with the previous analysis, the necessary assumptions for the factorability of the data were met. The one-component solution explained 33.29% of the total variance. All 35 items loaded positively on the first component with coefficients that exceeded .30 (see Table 6). In summary, the 12 items

from the three APS subscales (outcome satisfaction, preference for time pressure, and ability to meet deadlines) and the 23 items from the three subscales of the S-RCATS (prioritizing, time management, and self-monitoring) do indeed load positively on a single factor.

Table 5

Component Loading Coefficients for 3-factor Solution

Item	Component 1 Coefficients	Component 2 Coefficients	Component 3 Coefficients
Prioritizing 1	.490	.394	-.428
Prioritizing 2	.673		.398
Prioritizing 3	.498		
Prioritizing 4	.474	.445	
Prioritizing 5	.567	.341	
Prioritizing 6	.508		
Prioritizing 7	.704		
Time Management 1	.505	.339	-.398
Time Management 2	.437		-.309
Time Management 3	.519		
Time Management 4	.413		.327
Time Management 5	.503	.379	-.442
Time Management 6	.574		
Self-monitoring 1	.591		
Self-monitoring 2	.437		
Self-monitoring 3	.514		
Self-monitoring 4	.553		
Self-monitoring 5	.496		
Self-monitoring 6	.542		
Self-monitoring 7	.572	.367	
Self-monitoring 8	.625		
Self-monitoring 9	.439	.377	
Self-monitoring 10	.393		.401
Outcome Satisfaction 1	.698	-.506	
Outcome Satisfaction 2	.686	-.487	
Outcome Satisfaction 3	.733	-.473	
Outcome Satisfaction 4	.342		-.404
Preference for Time Pressure 1	.641	-.352	
Preference for Time Pressure 2	.645	-.442	
Preference for Time Pressure 3	.683	-.481	
Preference for Time Pressure 4	.709	-.376	
Ability to Meet Deadlines 1	.720	-.477	
Ability to Meet Deadlines 2	.664	-.441	
Ability to Meet Deadlines 3	.680	-.359	
Ability to Meet Deadlines 4	.632	-.448	

*Coefficients smaller than .30 are omitted

Table 6

Component Loading Coefficients for One-factor Solution

Item	Component 1 Coefficients
Prioritizing 1	.490
Prioritizing 2	.673
Prioritizing 3	.498
Prioritizing 4	.474
Prioritizing 5	.567
Prioritizing 6	.508
Prioritizing 7	.704
Time Management 1	.505
Time Management 2	.437
Time Management 3	.519
Time Management 4	.413
Time Management 5	.503
Time Management 6	.574
Self-monitoring 1	.591
Self-monitoring 2	.437
Self-monitoring 3	.514
Self-monitoring 4	.553
Self-monitoring 5	.496
Self-monitoring 6	.542
Self-monitoring 7	.572
Self-monitoring 8	.625
Self-monitoring 9	.439
Self-monitoring 10	.393
Outcome Satisfaction 1	.698
Outcome Satisfaction 2	.686
Outcome Satisfaction 3	.733
Outcome Satisfaction 4	.342
Preference for Time Pressure 1	.641
Preference for Time Pressure 2	.645
Preference for Time Pressure 3	.683
Preference for Time Pressure 4	.709
Ability to Meet Deadlines 1	.720
Ability to Meet Deadlines 2	.664
Ability to Meet Deadlines 3	.680
Ability to Meet Deadlines 4	.632

Research question three: evaluating the self-regulation scale and intentional decision to procrastinate subscale. The second part of research question three explored how the items on the S-RCATS related to the items on the intentional decision to procrastinate subscale of the APS. To address the second part of the third research question, the four items from the intentional decision to procrastinate subscale of the APS and 23 items from the three subscales of the S-RCATS (prioritizing, time management, and self-monitoring) were subjected to a principal components analysis using SPSS. The correlation matrix revealed several coefficients of .30 and above. The Kaiser-Meyer-Oklin value was .893, exceeding the recommended value of .60 (Tabachnick & Fidell, 2007), and

Bartlett's test of Sphericity was statistically significant, supporting the factorability of the correlation matrix.

The preliminary analysis revealed the presence of six components with eigenvalues that were grater than one, explaining a cumulative variance of 63.62%. The scree plot revealed a clear break after the third component. A parallel analysis also indicated that only three components exceeded the corresponding criterion values for a randomly generated data matrix of the same size (27 variables x 326 participants). The three-component solution explained a total of 49.75% of the variance, with the first component contributing 31.98%, the second component contributing 11.18%, and the third component contributing 6.59%. However, the component matrix indicated that all of the S-RCATS items loaded most strongly and positively on the first component, while the four-items of the Intentional Decision to Procrastinate subscale loaded negatively on the first component, and most strongly and positively on the second component. Additionally, the items that loaded on the second and third components yielded cross-loadings that were either weaker, negative, or both (see Table 7). Since all of the S-RCATS items loaded most strongly and positively on the first component, whereas, the Intentional Decision to Procrastinate subscale items loaded most strongly and positively on the second component, it was determined that a two-component solution would be the most parsimonious in demonstrating that the four items from the Intentional Decision to Procrastinate subscale and the 23 items from the three S-RCATS (prioritizing, time management, and self-monitoring), represented different hypothetical constructs.

Table 7

Component Loading Coefficients for 3-factor Solution

Item	Component 1 Coefficients	Component 2 Coefficients	Component 3 Coefficients
Prioritizing 1	.613		
Prioritizing 2	.706		
Prioritizing 3	.476		-.391
Prioritizing 4	.600		
Prioritizing 5	.650		
Prioritizing 6	.575		
Prioritizing 7	.731		
Time Management 1	.613		
Time Management 2	.514		.341
Time Management 3	.541		
Time Management 4	.459	.330	
Time Management 5	.622		
Time Management 6	.605		
Self-monitoring 1	.662		
Self-monitoring 2	.490		-.397
Self-monitoring 3	.568	.316	-.423
Self-monitoring 4	.586	.351	
Self-monitoring 5	.555	.347	-.338
Self-monitoring 6	.607		
Self-monitoring 7	.660		
Self-monitoring 8	.654		
Self-monitoring 9	.545		
Self-monitoring 10	.463		-.391
Intentional Decision to Procrastinate 1	-.357	.723	.338
Intentional Decision to Procrastinate 2	-.422	.704	
Intentional Decision to Procrastinate 3	-.385	.724	
Intentional Decision to Procrastinate 4	-.371	.615	

*Coefficients smaller than .30 are omitted

Therefore, the original 27 items were subjected to another principal components analysis that forced a two-factor solution. As with the previous analysis, the necessary assumptions for the factorability of the data were met. The two-component solution explained 43.16% of the total variance, with the first component contributing 31.98% and the second component contributing 11.18%. The 23 items for the S-RCATS loaded positively on the first component with coefficients that exceeded .45 and the four items from the Intentional Decision to Procrastinate subscale loaded positively on the second component with coefficients that exceeded .60 (see Table 8). In summary, the four items from the Intentional Decision to Procrastinate subscale and the 23 items from the three subscales of S-RCATS (prioritizing, time management, and self-monitoring) do indeed load on separate factors.

Table 8

Component Loading Coefficients for 2-factor Solution

Item	Component 1 Coefficients	Component 2 Coefficients
Prioritizing 1	.613	
Prioritizing 2	.706	
Prioritizing 3	.476	
Prioritizing 4	.600	
Prioritizing 5	.650	
Prioritizing 6	.575	
Prioritizing 7	.731	
Time Management 1	.613	
Time Management 2	.514	
Time Management 3	.541	
Time Management 4	.459	
Time Management 5	.622	
Time Management 6	.605	
Self-monitoring 1	.662	
Self-monitoring 2	.490	
Self-monitoring 3	.568	
Self-monitoring 4	.586	
Self-monitoring 5	.555	
Self-monitoring 6	.607	
Self-monitoring 7	.660	
Self-monitoring 8	.654	
Self-monitoring 9	.545	
Self-monitoring 10	.463	
Intentional Decision to Procrastinate 1		.723
Intentional Decision to Procrastinate 2		.704
Intentional Decision to Procrastinate 3		.724
Intentional Decision to Procrastinate 4		.615

*Coefficients smaller than .45 are omitted

Research question three: evaluating the self-regulation scale and irrational procrastination scale. The third part of research question three explored how the items on the new S-RCATS related to the items on the IPS. To address the final part of the third research question, the nine items from the IPS and 23 items from the three subscales of the S-RCATS (prioritizing, time management, and self-monitoring) were subjected to a principal components analysis using SPSS. The correlation matrix revealed several coefficients of .30 and above. The Kaiser-Meyer-Oklin value was .858, exceeding the recommended value of .60 (Tabachnick & Fidell, 2007), and Bartlett's test of Sphericity was statistically significant, supporting the factorability of the correlation matrix.

The preliminary analysis revealed the presence of six components with eigenvalues that were grater than one, explaining a cumulative variance of 71.23%. The scree plot

revealed a clear break after the third component. A parallel analysis also indicated that only three components exceeded the corresponding criterion values for a randomly generated data matrix of the same size (32 variables x 326 participants). The three-component solution explained a total of 59.87% of the variance, with the first component contributing 45.95%, the second component contributing 8.39%, and the third component contributing 5.53%. However, the component matrix indicated that all of the S-RCATS items loaded most strongly and positively on the first component, while the nine items of the IPS loaded negatively on the first component, with the exception of the three reverse-coded items that loaded most strongly and positively on the second component. Additionally, the items that loaded on the second and third components yielded cross-loadings that were either weaker, negative, or both (see Table 9). Since all of the S-RCATS items loaded most strongly and positively on the first component, whereas, the IPS items loaded most strongly and positively on the second component, it was determined that a two-component solution would be the most parsimonious in demonstrating that the items from the IPS and the items from the three S-RCATS subscales (prioritizing, time management, and self-monitoring), represented different hypothetical constructs.

Therefore, the original 32 items were subjected to another principal components analysis that forced a two-factor solution. As with the previous analysis, the necessary assumptions for the factorability of the data were met. The two-component solution explained 54.34% of the total variance, with the first component contributing 45.95%, the second component contributing 8.39%. The 23 items for the S-RCATS loaded positively on the first component with coefficients that exceeded .55, and the nine items from the IPS loaded positively on the second component with exception to the three reverse-coded items (see Table 10). In summary, the nine items from the IPS and the 23 items from the

three subscales of the S-RCATS (prioritizing, time management, and self-monitoring) do indeed load on separate factors.

Since the two-component solution produced several cross-loadings, a one-factor solution was also conducted to provide a clearer picture for how the S-RCATS items differ from the IPS items. The 23 items for the S-RCATS loaded positively on the first component and the nine items from the IPS loaded negatively on the first component (see Table 11). In summary, the 23 items from the three subscales of the S-RCATS (prioritizing, time management, and self-monitoring) load positively on a single factor and the nine items from the IPS load negatively on a single factor.

Table 9

Component Loading Coefficients for 3-factor Solution

Item	Component 1 Coefficients	Component 2 Coefficients	Component 3 Coefficients
Prioritizing 1	.696		-.494
Prioritizing 2	.761		
Prioritizing 3	.665		
Prioritizing 4	.629	.327	-.420
Prioritizing 5	.811		
Prioritizing 6	.640		
Prioritizing 7	.792		
Time Management 1	.689		-.419
Time Management 2	.671		-.422
Time Management 3	.664		
Time Management 4	.709		
Time Management 5	.701		-.395
Time Management 6	.764		
Self-monitoring 1	.728		
Self-monitoring 2	.575	.405	
Self-monitoring 3	.799		
Self-monitoring 4	.762		
Self-monitoring 5	.730		.366
Self-monitoring 6	.749		
Self-monitoring 7	.852		
Self-monitoring 8	.794		
Self-monitoring 9	.594	.303	-.300
Self-monitoring 10	.604	.380	.316
Irrational Procrastination 1	-.497	.600	
Irrational Procrastination 2**	-.222	-.214	.210
Irrational Procrastination 3	-.581	.545	
Irrational Procrastination 4	-.627	.570	
Irrational Procrastination 5	-.687	.466	
Irrational Procrastination 6**	-.656	.196	-.151
Irrational Procrastination 7	-.497	.533	
Irrational Procrastination 8	-.648	.485	
Irrational Procrastination 9**	-.568	.002	.012

*Coefficients smaller than .30 are omitted

**Reverse coded items; coefficients under .30 are included

Table 10

Component Loading Coefficient for 2-factor Solution

Item	Component 1 Coefficients	Component 2 Coefficients
Prioritizing 1	.696	
Prioritizing 2	.761	
Prioritizing 3	.665	
Prioritizing 4	.629	
Prioritizing 5	.811	
Prioritizing 6	.640	
Prioritizing 7	.792	
Time Management 1	.689	
Time Management 2	.671	
Time Management 3	.664	
Time Management 4	.709	
Time Management 5	.701	
Time Management 6	.764	
Self-monitoring 1	.728	
Self-monitoring 2	.575	
Self-monitoring 3	.799	
Self-monitoring 4	.762	
Self-monitoring 5	.730	
Self-monitoring 6	.749	
Self-monitoring 7	.852	
Self-monitoring 8	.794	
Self-monitoring 9	.594	
Self-monitoring 10	.604	
Irrational Procrastination 1	-.497	.600
Irrational Procrastination 2**	-.222	-.214
Irrational Procrastination 3	-.581	.545
Irrational Procrastination 4	-.627	.570
Irrational Procrastination 5	-.687	.466
Irrational Procrastination 6**	-.656	.196
Irrational Procrastination 7	-.497	.533
Irrational Procrastination 8	-.648	.485
Irrational Procrastination 9**	-.568	.002

*Coefficients smaller than .45 are omitted

**Reverse coded items; coefficients under .30 are included

Table 11

Component Loading Coefficients for 1-factor Solution

Item	Component 1 Coefficients
Prioritizing 1	.696
Prioritizing 2	.761
Prioritizing 3	.665
Prioritizing 4	.629
Prioritizing 5	.811
Prioritizing 6	.640
Prioritizing 7	.792
Time Management 1	.689
Time Management 2	.671
Time Management 3	.664
Time Management 4	.709
Time Management 5	.701
Time Management 6	.764
Self-monitoring 1	.728
Self-monitoring 2	.575
Self-monitoring 3	.799
Self-monitoring 4	.762
Self-monitoring 5	.730
Self-monitoring 6	.749
Self-monitoring 7	.852
Self-monitoring 8	.794
Self-monitoring 9	.594
Self-monitoring 10	.604
Irrational Procrastination 1	-.497
Irrational Procrastination 2*	-.222
Irrational Procrastination 3	-.581
Irrational Procrastination 4	-.627
Irrational Procrastination 5	-.687
Irrational Procrastination 6*	-.656
Irrational Procrastination 7	-.497
Irrational Procrastination 8	-.648
Irrational Procrastination 9*	-.568

*Reverse coded items

Research question four: comparing non-delayers, intentional delayers, and non-intentional delayers. The fourth research question was targeted at understanding the self-regulatory, motivational, and behavioral differences between those participants who reported that they either did not delay, intentionally delayed, or non-intentionally delayed the task that they had in mind. First, based upon participants' self-reported responses, they were divided into three groups: non-delayers (N = 98), intentional delayers (N = 123), and non-intentional delayers (N = 105). Although the three groups were unequal in size, the assumption of the homogeneity of variance was not violated in the following statistical analyses as indicated by non-significant Levene's test values.

Research question four: self-regulatory differences by type of delay. A one-way between groups multivariate analysis of variance was performed to investigate differences in self-regulatory skills based upon the type of delay in which the student engaged. The three subscales of the S-RCATS (prioritizing, time management, and self-monitoring) were the dependent variables and the type of delay (no-delay, intentional delay, non-intentional delay) was the independent variable (see Table 12 for descriptive statistics). A significant difference was found between the three groups on the combined self-regulatory dimensions, $F(6, 642) = 6.12$, $p < .001$; Wilks' Lambda = .90; partial eta squared = .05. When the results for the dependent variables were considered separately, all three self-regulatory dimensions exhibited statistically significant differences using a Bonnferroni adjusted alpha level of .017 (see Table 13). Results indicated that non-delayers had significantly higher mean values on all three self-regulatory dimensions over intentional delayers and non-intentional delayers (see Table 14 for Tukey's post hoc comparisons). However, no significant differences were found between participants who engaged in intentional and non-intentional delays on any of the three self-regulatory dimensions (see Figures 1-3).

Table 12

Descriptive Statistics for Self-regulatory Characteristics by Type of Delay

Dependent Variable	Intentional Delay	Mean	Standard Deviation	N
Prioritizing	Yes	3.77	.63	123
	No	3.79	.61	105
	No Delay	4.16	.53	98
Time Management	Yes	3.44	.66	123
	No	3.44	.66	105
	No Delay	3.90	.63	98
Self-monitoring	Yes	3.85	.53	123
	No	3.84	.54	105
	No Delay	4.08	.55	98

Table 13

Between-subjects Effects for Self-regulatory Dimensions

Variable	(*F* 2, 323)	Significance	Partial Eta Squared
Prioritizing	13.69	.000	.08
Time Management	17.16	.000	.10
Self-monitoring	6.37	.002	.04

Table 14

Tukey Post Hoc Comparisons for Self-regulatory Dimensions by Type of Delay

Dependent Variable	(I) Intentional Delay	(J) Intentional Delay	Mean Difference (I-J)	Sig.
Prioritizing	Yes	No	-.0157	.979
		No Delay	-.3838**	.000
	No	Yes	.0157	.979
		No Delay	-.3681**	.000
	No Delay	Yes	.3838**	.000
		No	.3681**	.000
Time Management	Yes	No	.0009	1.000
		No Delay	-.4606**	.000
	No	Yes	.0009	1.000
		No Delay	-.4616**	.000
	No Delay	Yes	.4606**	.000
		No	.4616**	.000
Self-monitoring	Yes	No	.0030	.999
		No Delay	-.2320*	.005
	No	Yes	-.0030	.999
		No Delay	-.2350*	.006
	No Delay	Yes	.2320*	.005
		No	.2350*	.006

** $p < .001$
* $p < .01$

Figure 1. Mean Prioritizing Skills Score by Type of Delay

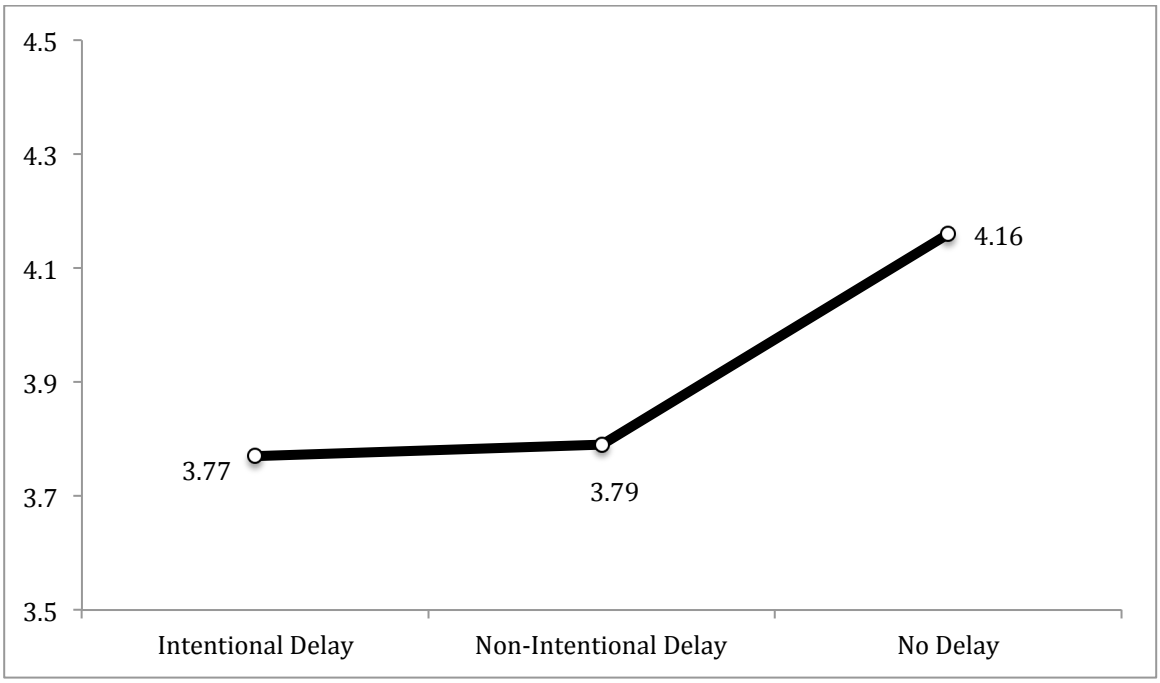


Figure 2. Mean Time Management Skills Score by Type of Delay

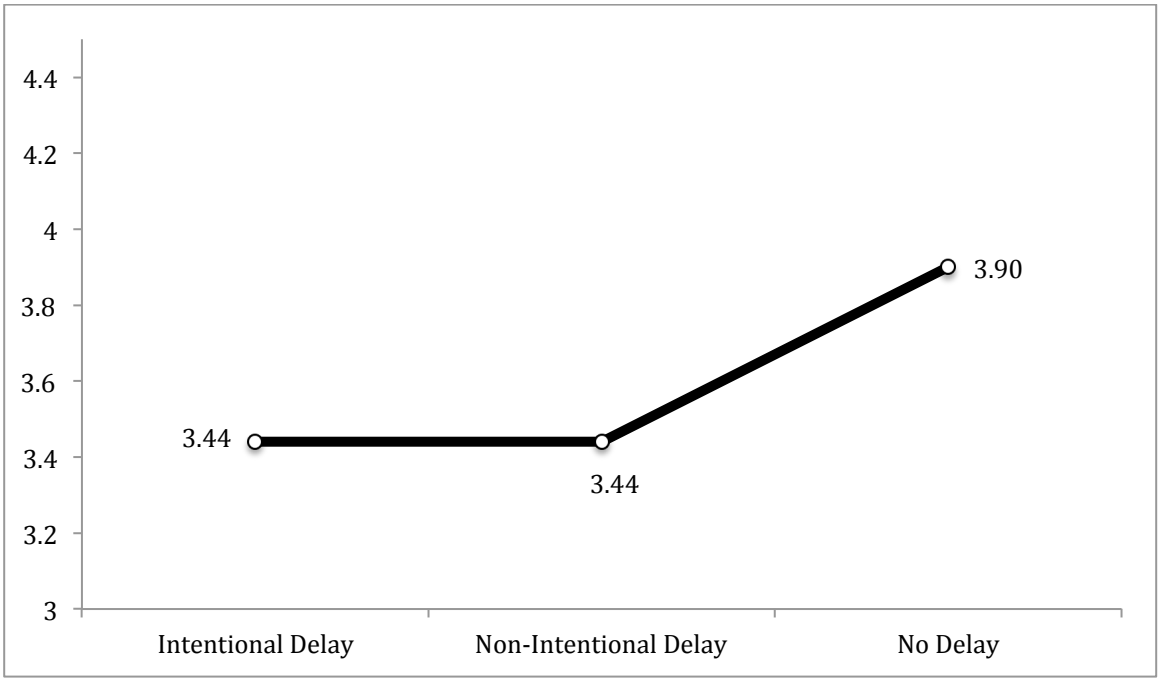
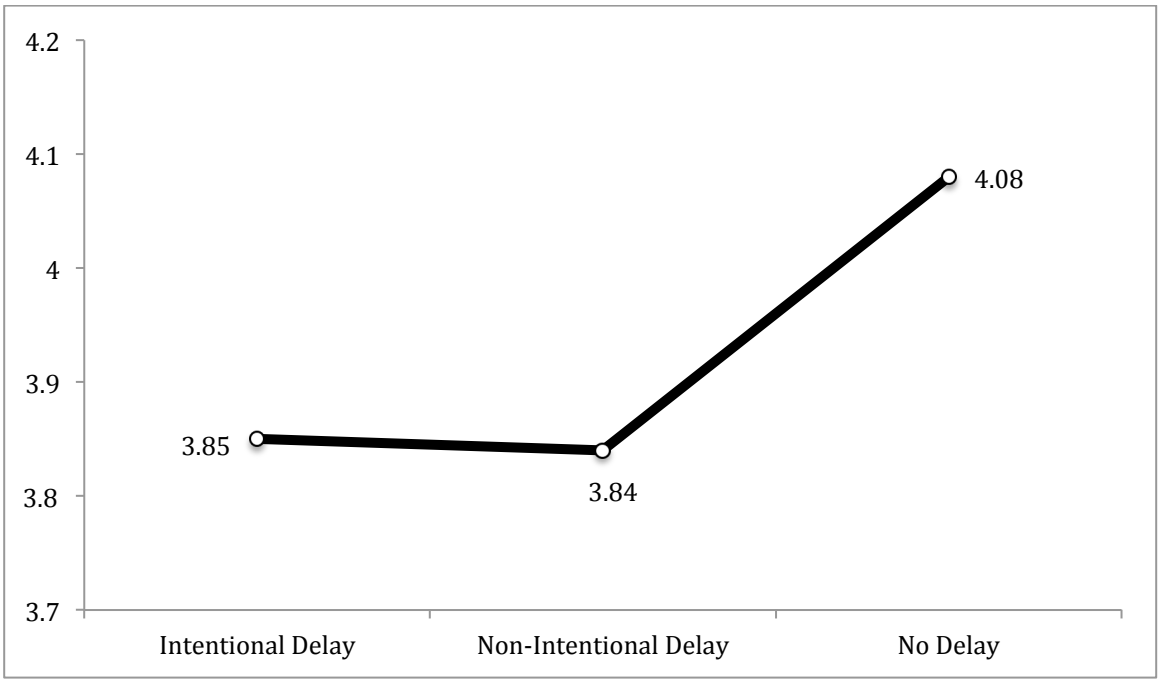


Figure 3. Mean Self-monitoring Skills Score by Type of Delay



Research question four: motivational differences by type of delay. A one-way between groups multivariate analysis of variance was performed to investigate differences in motivational characteristics based upon the type of delay in which the student engaged. Three of the four achievement goal subscales (performance approach, mastery avoidance, mastery approach), perceived instrumentality, and self-efficacy were the dependent variables, and the type of delay (no-delay, intentional delay, non-intentional delay) was the independent variable (see Table 15 for descriptive statistics). The performance avoidance subscale was excluded from the analysis due to the lack of internal consistency among the items of the scale. A significant difference was found between the three groups on the combined motivational dimensions, $F(6, 638) = 4.00$, $p < .001$; Wilks' Lambda = .89; partial eta squared = .06. When the results for the dependent variables were considered separately, the only motivational dimensions that exhibited statistically significant

differences using a Bonnferroni adjusted alpha level of .01, were mastery approach goals, $F(2, 323) = 7.27$, $p = .001$, partial eta squared = .04, and self-efficacy $F(2, 323) = 11.01$, $p < .001$, partial eta squared = .06 (see Table 16). Results indicated that non-delayers had significantly higher mean values for mastery approach goals ($M = 3.90$, $SD = .93$) than intentional delayers ($M = 3.43$, $SD = .94$), but not non-intentional delayers ($M = 3.65$, $SD = .90$) (see Figure 4). Results also indicated that non-delayers had significantly higher mean values for self-efficacy ($M = 90.14$, $SD = .10.65$) than both intentional delayers ($M = 82.07$, $SD = 15.30$) and non-intentional delayers ($M = 81.10$, $SD = 18.11$) (see Figure 5). See Table 17 for Tukey's post hoc comparisons.

Table 15

Descriptive Statistics for Motivational Characteristics by Type of Delay

Dependent Variable	Intentional Delay	Mean	Standard Deviation	N
Performance Approach Goals	Yes	3.36	1.02	123
	No	3.41	1.08	105
	No Delay	3.45	1.16	98
Mastery Avoidance Goals	Yes	2.82	.98	123
	No	2.62	.95	105
	No Delay	2.66	1.15	98
Mastery Approach Goals	Yes	3.43	.94	123
	No	3.65	.89	105
	No Delay	3.90	.93	98
Perceived Instrumentality	Yes	3.23	1.03	123
	No	3.39	.96	105
	No Delay	3.61	1.00	98
Self-efficacy	Yes	82.07	15.30	123
	No	81.10	18.11	105
	No Delay	90.14	10.56	98

Table 16

Between-subjects Effects for Motivational Characteristics

Variable	(*F* 2, 323)	Significance	Partial Eta Squared
Performance Approach Goals	.197	.821	.001
Mastery Avoidance Goals	1.28	.279	.008
Mastery Approach Goals	7.27	.001	.043
Perceived Instrumentality	3.85	.022	.023
Self-efficacy	11.01	.000	.064

Figure 4 Mean Mastery Approach Goal Score by Type of Delay

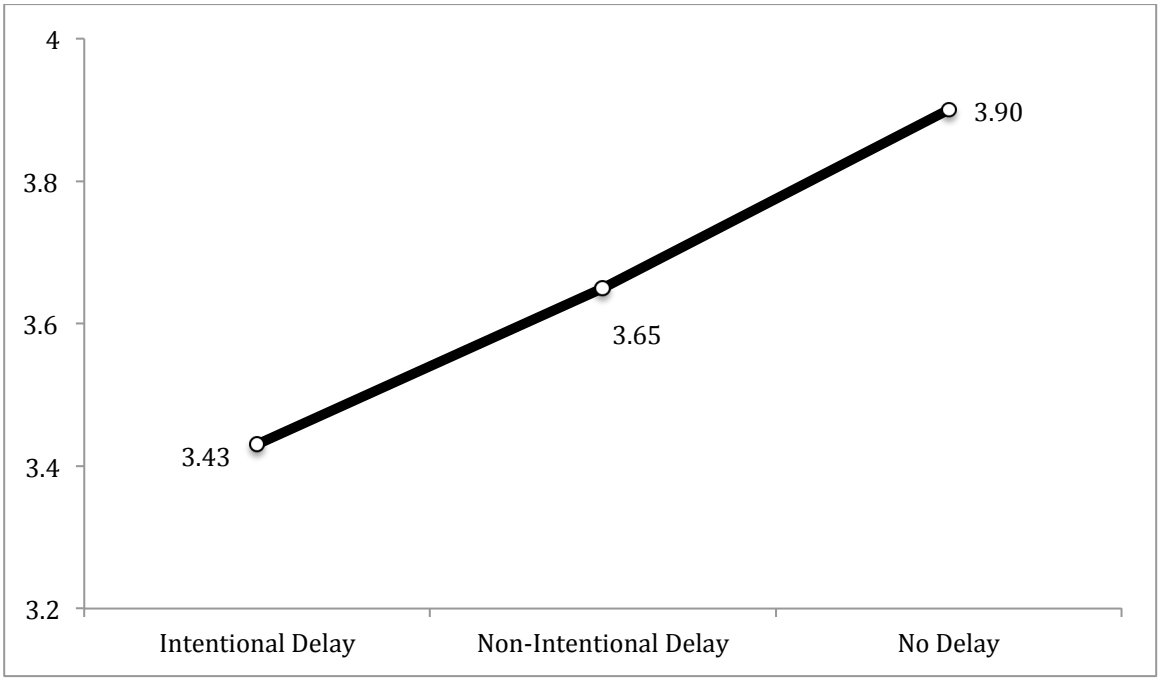


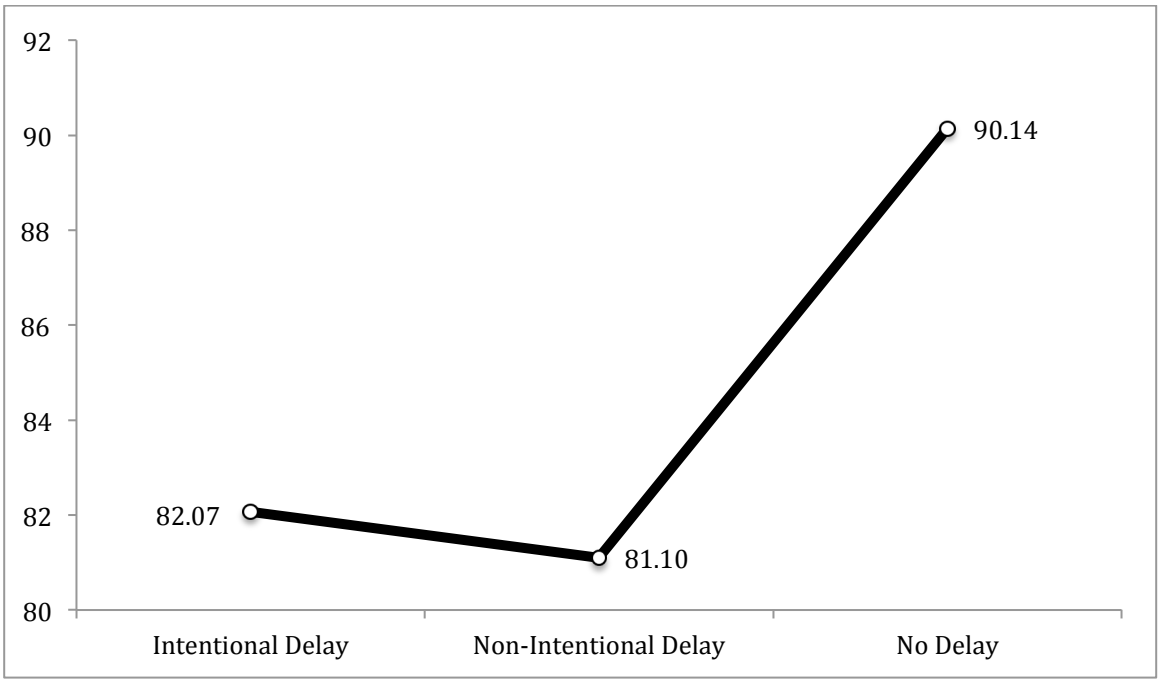
Table 17

Tukey Post Hoc Comparisons for Motivational Characteristics by Type of Delay

Dependent Variable	(I) Intentional Delay	(J) Intentional Delay	Mean Difference (I-J)	Sig.
Performance Approach	Yes	No	-.0459	.945
		No Delay	-.0919	.805
	No	Yes	.0459	.945
		No Delay	-.0460	.951
	No Delay	Yes	.0919	.805
		No	.0460	.951
Mastery Avoidance	Yes	No	.2066	.285
		No Delay	.1592	.487
	No	Yes	-.2066	.285
		No Delay	-.0474	.942
	No Delay	Yes	-.1592	.487
		No	.0474	.942
Mastery Approach	Yes	No	-.2181	.177
		No Delay	-.4752**	.000
	No	Yes	.2181	.177
		No Delay	-.2571	.117
	No Delay	Yes	.4752**	.000
		No	.2571	.117
Perceived	Yes	No	-.1601	.452
Instrumentality		No Delay	-.3761*	.016
	No	Yes	.1601	.452
		No Delay	-.2159	.275
	No Delay	Yes	.3761*	.016
		No	.2159	.275
Self-efficacy	Yes	No	.9630	.881
		No Delay	-8.0717**	.000
	No	Yes	-.9630	.881
		No Delay	-9.0347**	.000
	No Delay	Yes	8.0717**	.000
		No	9.0347**	.000

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

Figure 5 Mean Self-efficacy Score by Type of Delay



Research question four: behavioral differences by type of delay. A one-way between groups multivariate analysis of variance was performed to investigate differences in behavioral characteristics based upon the type of delay in which the student engaged. The grade received, the level of procrastination, and perceived flow experiences were the dependent variables and the type of delay (no-delay, intentional delay, non-intentional delay) was the independent variable (see Table 18 for descriptive statistics). A significant difference was found between the three groups on the combined behavioral dimensions, $F(6, 608) = 15.49$, $p < .001$; Wilks' Lambda = .75; partial eta squared = .13. When the results for the dependent variables were considered separately, the only behavioral dimensions revealing statistically significant differences using a Bonnferroni adjusted alpha level of .017, were procrastination, $F(2, 306) = 47.25$, $p = .001$, partial eta squared = .24, and perceived flow $F(2, 306) = 8.23$, $p < .001$, partial eta squared = .05 (see Table 19).

Results indicated that non-delayers had significantly lower mean values for procrastination (M = 2.17, SD = .93), than intentional delayers (M = 3.33, SD = .92) and non-intentional delayers (M = 3.27, SD = .96) (see Figure 6). Intentional delayers had slightly higher mean scores on procrastination than non-intentional delayers, but no significant difference was found between the two groups (p = .873).

While Schraw et al. (2007) reported that some students procrastinated as a way of achieving peak experience and flow, results from this study revealed that non-delayers (M = 3.59, SD = .58) reported significantly more perceptions of flow than intentional delayers (M = 3.26, SD = .59) and non-intentional delayers (M = 3.40, SD = .58) (see Figure 7). Again, there was no significant difference in perceived flow between intentional delayers and non-intentional delayers (p = .166). See Table 20 for Tukey's post hoc comparisons.

Table 18

Descriptive Statistics for Behavioral Outcomes by Type of Delay

Dependent Variable	Intentional Delay	Mean	Standard Deviation	N
Grade Received	Yes	4.58	.70	118
	No	4.62	.72	99
	No Delay	4.71	.70	92
Irrational	Yes	3.33	.92	118
Procrastination	No	3.27	.96	99
	No Delay	2.17	.93	92
Flow	Yes	3.26	.59	118
	No	3.40	.58	99
	No Delay	3.59	.58	92

Table 19

Between-subjects Effects for Behavioral Outcomes

Variable	(*F* 2, 306)	Significance	Partial Eta Squared
Grade Received	.895	.410	.006
Irrational Procrastination	47.25	.000	.236
Flow	8.23	.000	.051

Table 20

Tukey Post Hoc Comparisons for Behavioral Outcomes by Type of Delay

Dependent Variable	(I) Intentional Delay	(J) Intentional Delay	Mean Difference (I-J)	Sig.
Grade	Yes	No	-.0399	.910
Received		No Delay	-.1303	.383
	No	Yes	.0399	.910
		No Delay	-.0904	.652
	No Delay	Yes	.1303	.383
		No	.0904	.652
Irrational	Yes	No	.0635	.873
Procrastination		No Delay	1.1600**	.000
	No	Yes	-.0635	.873
		No Delay	1.0965**	.000
	No Delay	Yes	-1.1600**	.000
		No	-1.0965**	.000
Flow	Yes	No	-.1449	.131
		No Delay	-.3305**	.000
	No	Yes	.1449	.131
		No Delay	-.1856*	.048
	No Delay	Yes	.3305**	.000
		No	.1856*	.048

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

Figure 6 Mean Procrastination Scores by Type of Delay

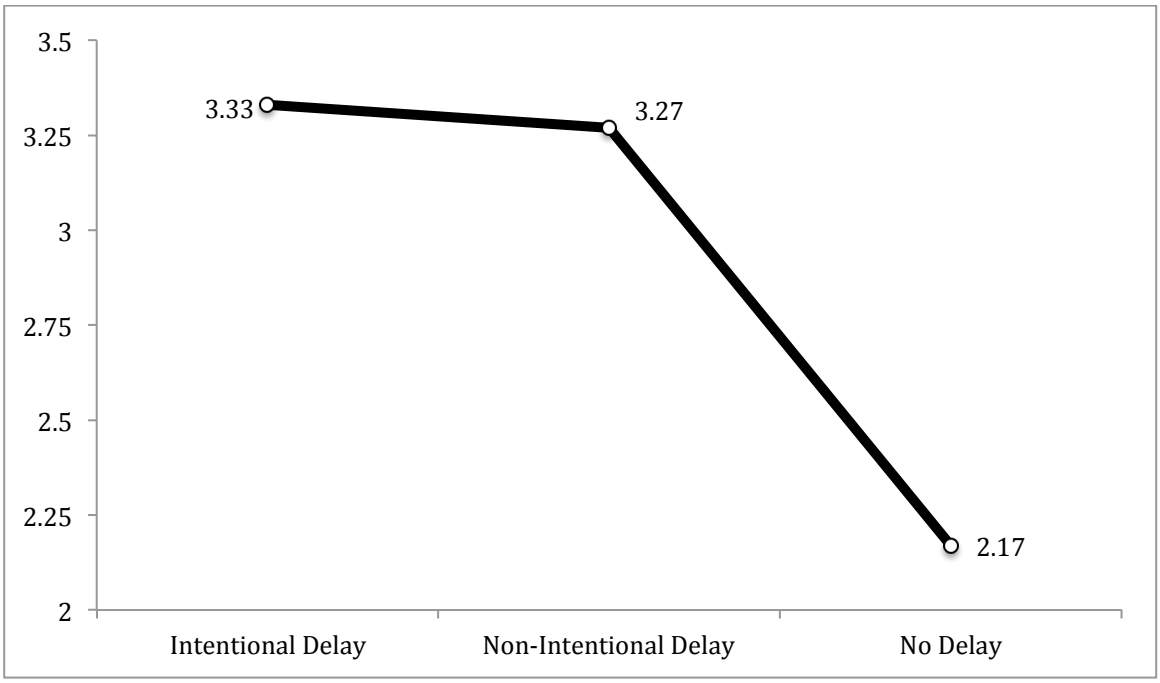
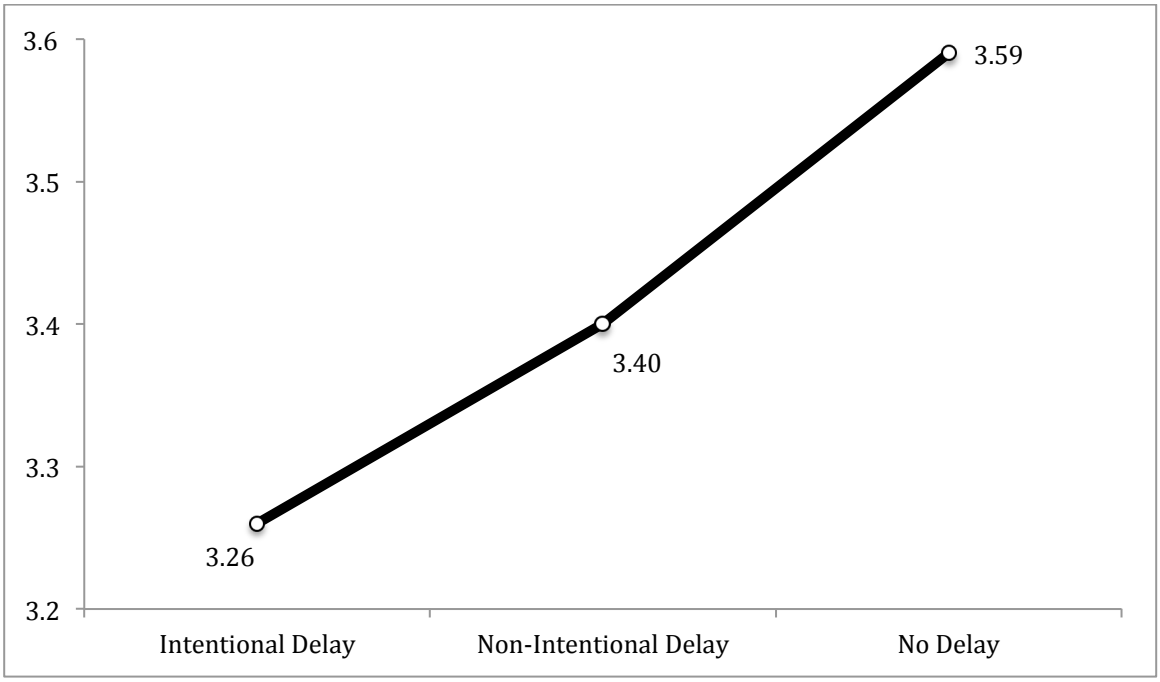


Figure 7 Mean Flow Scores by Type of Delay



In summary, it was not surprising that those students who reported not delaying the project or paper they had in mind, had higher scores on self-regulation, mastery approach goals, self-efficacy, and flow as well as lower scores on procrastination than those who reported intentional and non-intentional delays. On the other hand, it was unexpected how remarkably similar intentional delayers were with non-intentional delayers in terms of their self-regulation, motivation, and behavior. Given the results for the first two research questions, it possible that the classification of intentional and non-intentional delayers may have been faulty.

Research question four: post hoc analyses. One of the issues that may have influenced the findings related to research question four is the apparent simplicity of the questions asked of participants at the beginning of the study: "Did you delay starting the project? If so, did you do so intentionally?" These questions could have been interpreted differently than expected. Some individuals might have believed they intentionally delayed when they chose to delay because they thought the task was too challenging, because they did not know where to begin, or because they were lazy or unmotivated For example, some specific reasons given for intentionally delaying included: "Knowing how hard the assignment was, I just didn't want to start," "I was very lost on how to even begin writing this paper," "Wasn't motivated to begin working on it as early as planned," "Work, laziness, social interactions, sleep deprivation." Such choices are in a sense intentional, but not the type of intentionality reflected in self-regulated delays. It is even conceivable that someone who chose to delay the onset of the task because other priorities took precedence, a very self-regulated form of delay, may not have thought of this as intentional. For example, some specific reasons for non-intentionally delaying included: "Not a priority compared to other classes with a borderline grade," "It is not my most difficult class and I knew the

assignment would not be very complicated," and "I can't ever seem to begin projects or papers when I feel I need to, something more immediate and seemingly more pressing usually gets in the way." Such potential confusion about the nature of the question asked may have led to some participants being incorrectly classified. So the question remains, is there a way to tease out those in the 'delay category' who were truly self-regulated in their intention rather than avoidant or self-protective in delaying?

In an attempt to address the question above, an alternative post hoc analysis was conducted. Using the 228 participants who reported delaying, a median split procedure was conducted to better classify participants as procrastinators or self-regulated delayers. Participants who indicated delaying and who had median or above scores on the Irrational Procrastination Scale (*Mdn* = 3.00) and below median scores on the Active Procrastination Scale (*Mdn* = 3.92) were classified as "non-self-regulated delayers/traditional procrastinators," and (2) participants who indicated delaying and who had median or above scores on the APS and below median scores on the IPS were classified as "self-regulated delayers." Since the findings from the first two research questions showed that the intentional decision to procrastinate subscale was not positively related to the APS as a whole, the subscale was excluded in the reclassification of individuals using the median split procedure.

Post hoc self-regulatory differences by type of delay. A one-way between groups multivariate analysis of variance was performed to investigate differences in self-regulatory skills based upon the type of delay in which the student engaged. The three subscales of the S-RCATS (prioritizing, time management, and self-monitoring) were the dependent variables and the type of delay (procrastination, self-regulated delay) was the independent variable (see Table 21 for descriptive statistics). A significant difference was found between

the two groups on the combined self-regulatory dimensions, $F(3, 168) = 24.75$, $p < .001$; Wilks' Lambda = .69; partial eta squared = .31. When the results for the dependent variables were considered separately, all three self-regulatory dimensions exhibited statistically significant differences using a Bonnferroni adjusted alpha level of .017 (see Table 22). Results indicated that self-regulated delayers had significantly higher mean values on all three self-regulatory dimensions over procrastinators (see Figures 8-10).

Table 21

Descriptive Statistics for Self-regulatory Dimensions by Type of Delay

Dependent Variable	Group	Mean	Standard Deviation	N
Prioritizing	Procrastination	3.54	.57	122
	Self-regulated Delay	4.18	.52	50
Time Management	Procrastination	3.21	.56	122
	Self-regulated Delay	3.86	.68	50
Self-monitoring	Procrastination	3.62	.50	122
	Self-regulated Delay	4.27	.41	50

Table 22

Between-subjects Effects for Self-regulatory Dimensions

Variable	(F 1, 170)	Significance	Partial Eta Squared
Prioritizing	46.99	.000	.22
Time Management	42.32	.000	.20
Self-monitoring	66.63	.000	.28

Figure 8 Mean Prioritizing Skills Score by Type of Delay

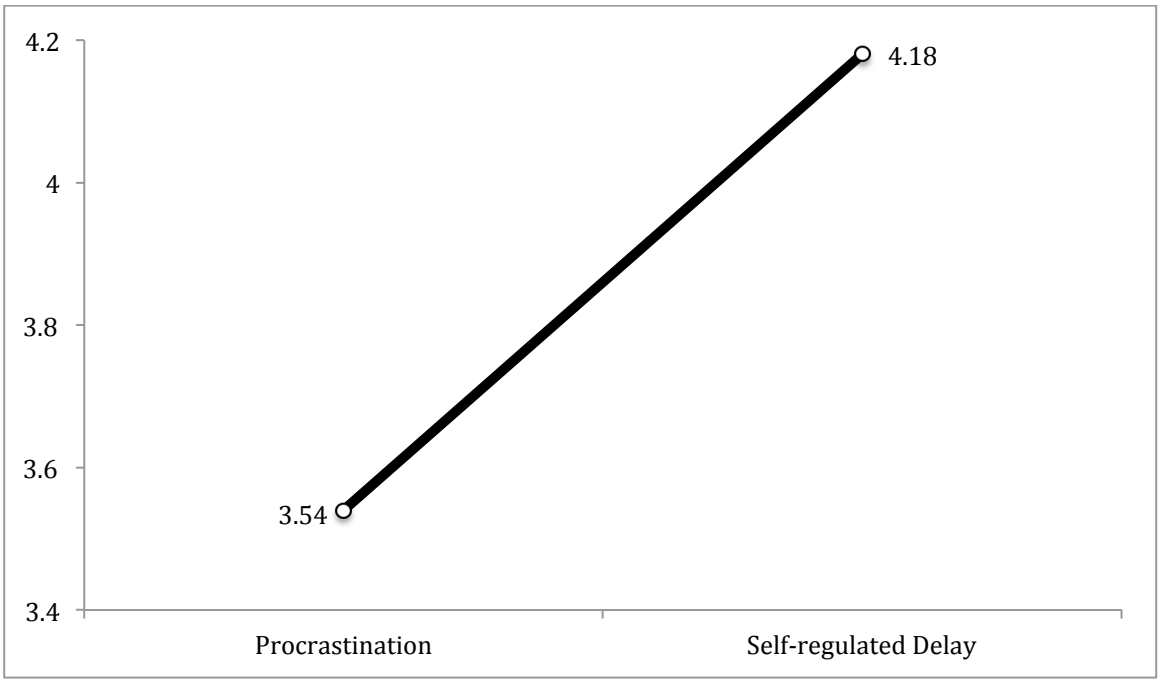


Figure 9 Mean Time Management Skills Score by Type of Delay

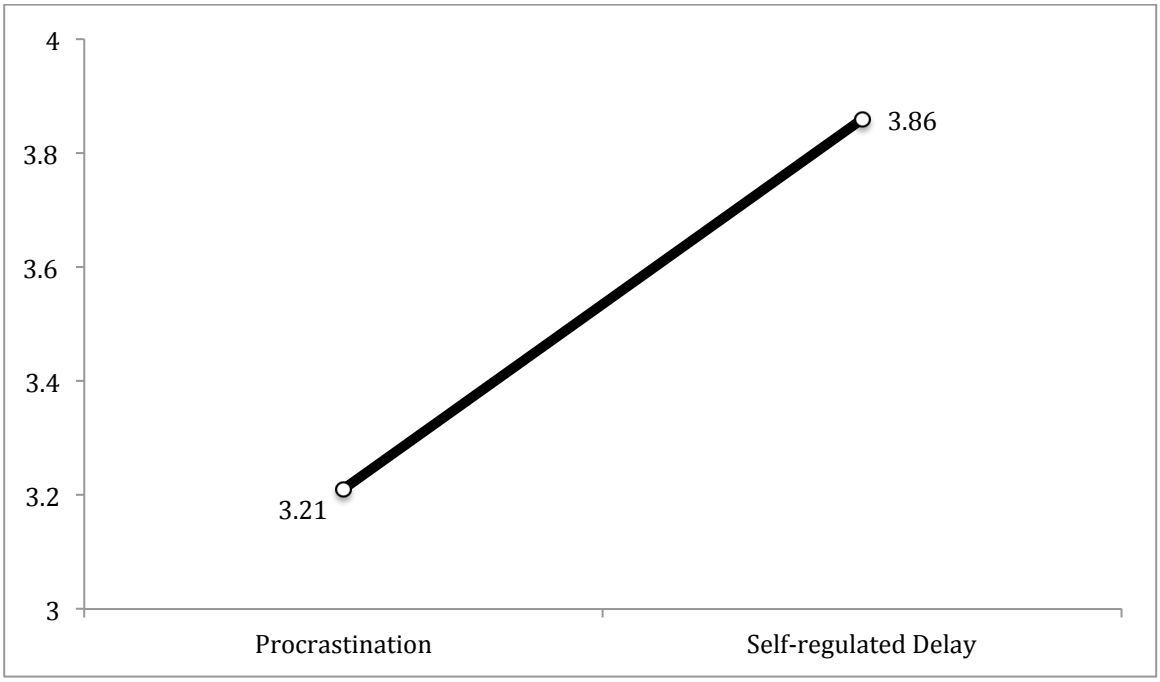
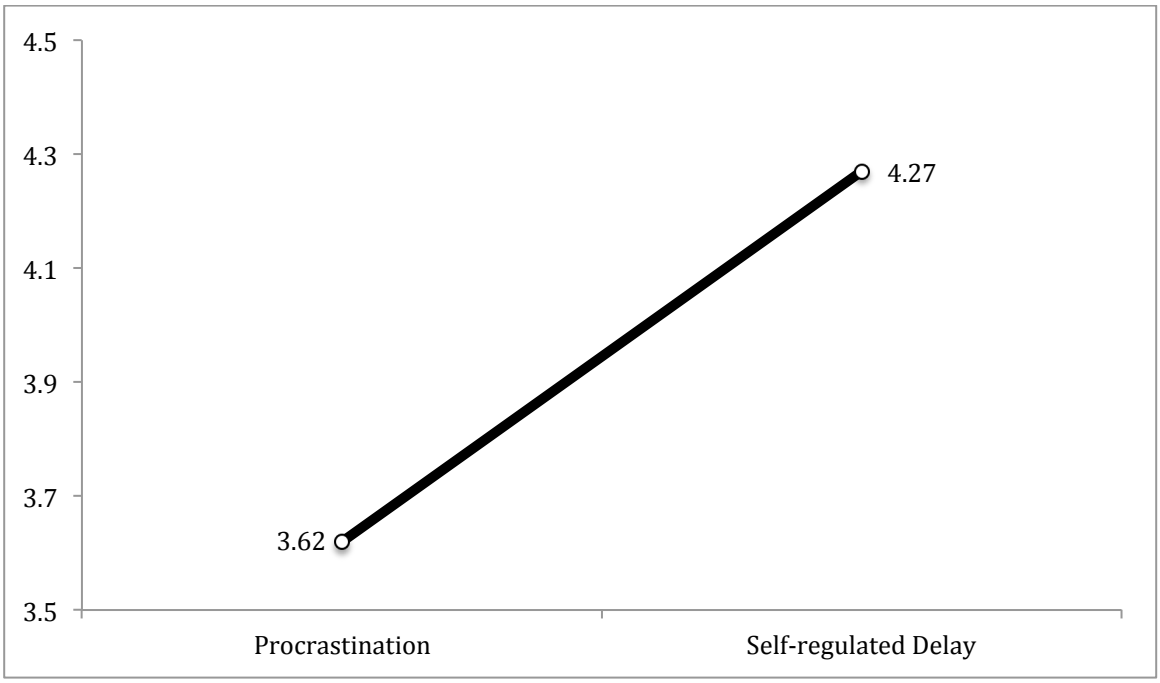


Figure 10 Mean Self-monitoring Skills Score by Type of Delay



Post hoc motivational differences by type of delay. A one-way between groups multivariate analysis of variance was performed to investigate differences in motivational characteristics based upon the type of delay in which the student engaged. Three of the four achievement goal subscales (performance approach, mastery avoidance, mastery approach), perceived instrumentality, and self-efficacy were the dependent variables, and the type of delay (procrastination, self-regulated delay) was the independent variable (see Table 23 for descriptive statistics). The performance avoidance subscale was excluded from the analysis due to the lack of internal consistency among the items of the scale. A significant difference was found between the two groups on the combined motivational dimensions, $F(5, 166) = 9.59$, $p < .001$; Wilks' Lambda = .78; partial eta squared = .22. When the results for the dependent variables were considered separately, all of the motivational dimensions, except performance approach goals, exhibited statistically

significant differences using a Bonnferroni adjusted alpha level of .01 (see Table 24). Results indicated that self-regulated delayers had significantly lower mean values for mastery avoidance goals (M = 2.26, SD = .98) than procrastinators (M = 2.84, SD = .90) (see Figure 11); self-regulated delayers had significantly higher mean values for mastery approach goals (M = 3.74, SD = .94) than procrastinators (M = 3.36, SD = .88) (see Figure 12); self-regulated delayers had significantly higher mean values for perceptions of instrumentality (M = 3.57, SD = 1.03) than procrastinators (M = 3.12, SD = .92) (see Figure 13); and self-regulated delayers had significantly higher mean values for self-efficacy (M = 91.31, SD = 7.97) than procrastinators (M = 76.55, SD = 18.30) (see Figure 14).

Table 23

Descriptive Statistics for Motivational Characteristics by Type of Delay

Dependent Variable	Group	Mean	Standard Deviation	N
Performance Approach Goals	Procrastination	3.41	.95	122
	Self-regulated Delay	3.31	1.23	50
Mastery Avoidance Goals	Procrastination	2.84	.90	122
	Self-regulated Delay	2.26	.98	50
Mastery Approach Goals	Procrastination	3.36	.88	122
	Self-regulated Delay	3.74	.94	50
Perceived Instrumentality	Procrastination	3.12	.92	122
	Self-regulated Delay	3.57	1.03	50
Self-efficacy	Procrastination	76.55	18.30	122
	Self-regulated Delay	91.31	7.97	50

Table 24

Between-subjects Effects for Motivational Characteristics

Variable	(*F* 1, 170)	Significance	Partial Eta Squared
Performance Approach Goals	.306	.581	.002
Mastery Avoidance Goals	14.31	.000	.078
Mastery Approach Goals	6.45	.012	.037
Perceived Instrumentality	8.00	.005	.045
Self-efficacy	30.08	.000	.150

Figure 11 Mean Mastery Avoidance Goal Score by Delay Type

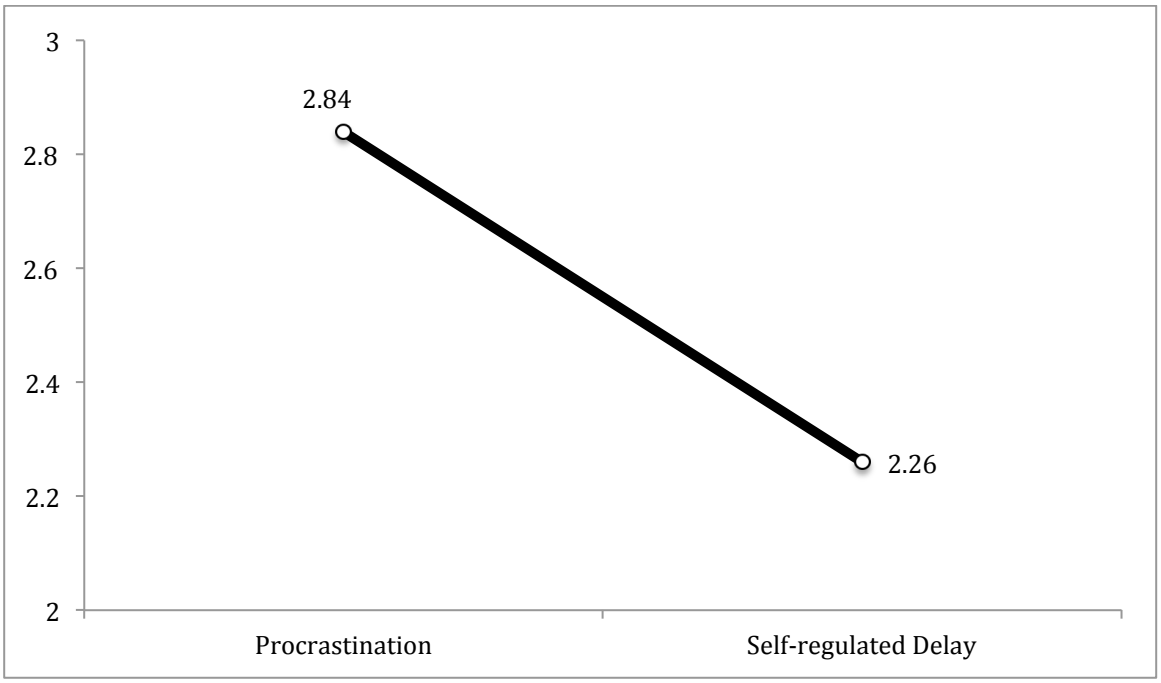


Figure 12 Mean Mastery Approach Goal Score by Type of Delay

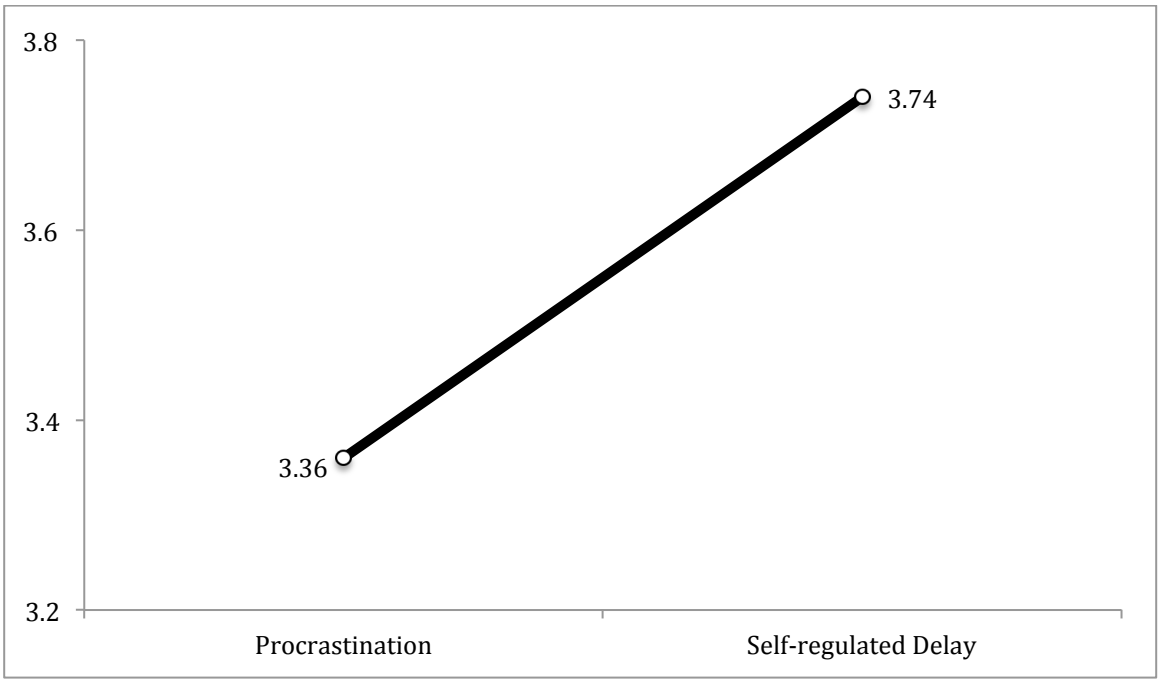


Figure 13 Mean Perceived Instrumentality Score by Type of Delay

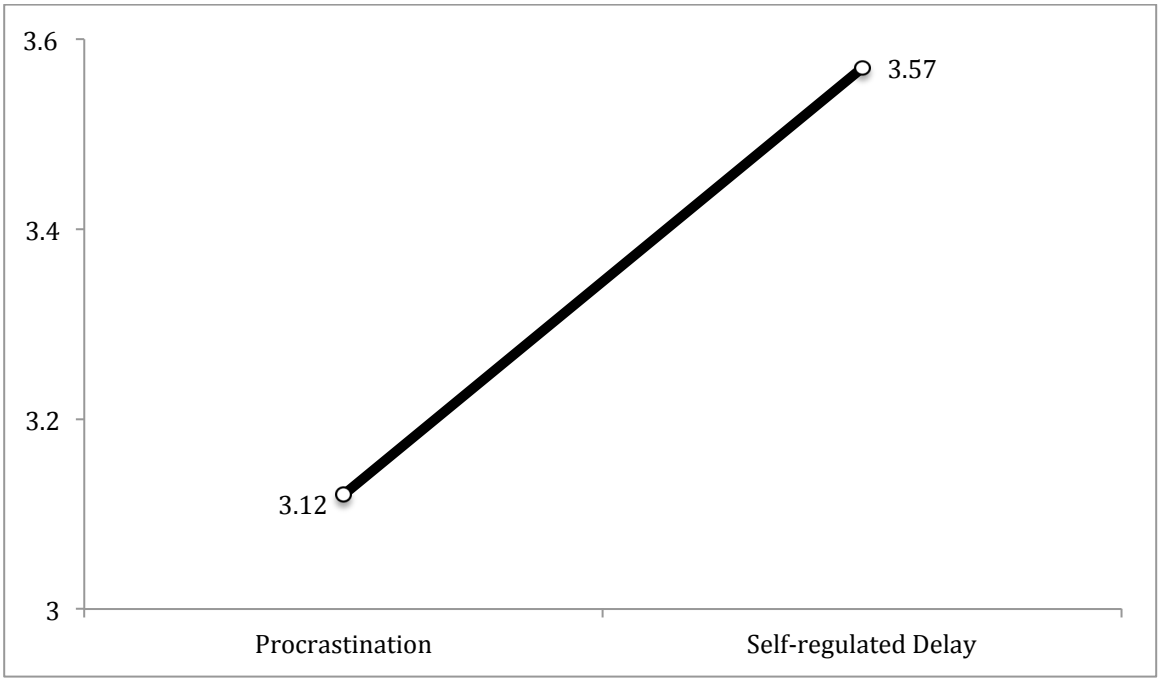
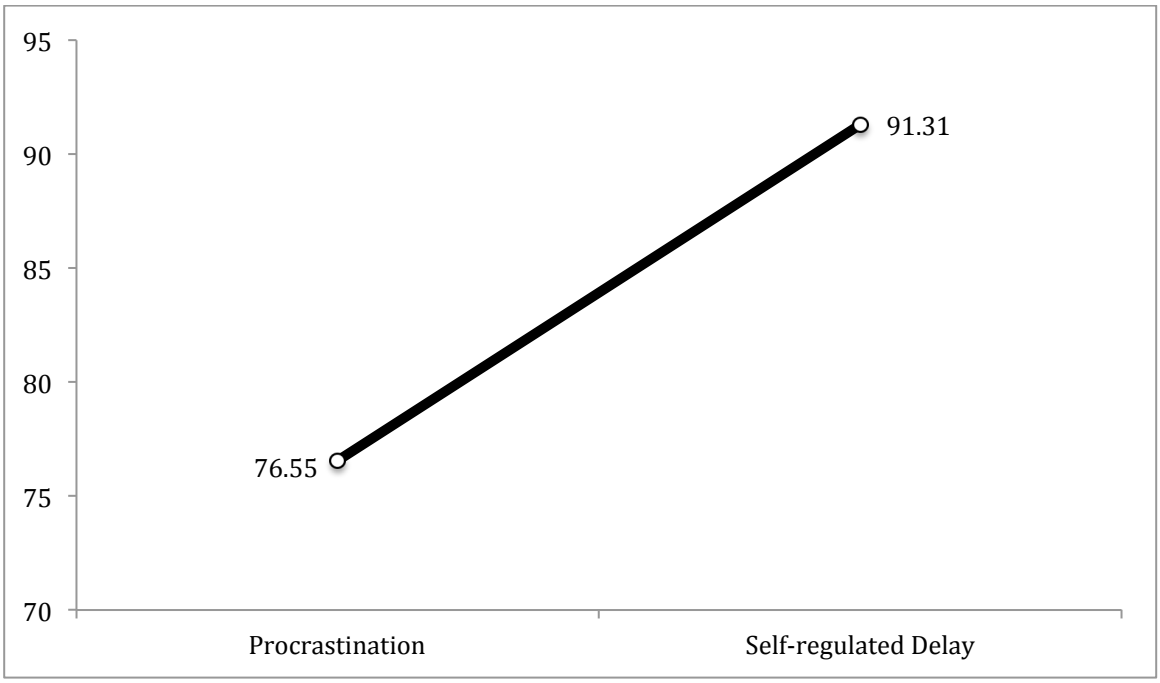


Figure 14 Mean Self-efficacy Score by Type of Delay



Post hoc behavioral differences by type of delay. A one-way between groups multivariate analysis of variance was performed to investigate differences in behavioral characteristics based upon the type of delay in which the student engaged. The grade received, the level of procrastination, and perceived flow experiences were the dependent variables and the type of delay (procrastination, self-regulated delay) was the independent variable (see Table 25 for descriptive statistics). A significant difference was found between the two groups on the combined behavioral dimensions, $F(3, 159) = 132.01$, $p < .001$; Wilks' Lambda = .29; partial eta squared = .71. When the results for the dependent variables were considered separately, all of the behavioral dimensions revealed statistically significant differences using a Bonnferroni adjusted alpha level of .017, grade received, $F(1, 161) = 21.78$, $p < .001$, partial eta squared = .12, procrastination, $F(1, 161) = 365.47$, $p < .001$, partial eta squared = .69, and perceived flow $F(1, 161) = 30.10$, $p < .001$, partial eta

squared = .16 (see Table 22). Results indicated that self-regulated delayers had significantly higher mean values for the grade received (M = 4.94, SD = .24) than procrastinators (M = 4.39, SD = .82) (see Figure 15); self-regulated delayers had significantly lower mean values for procrastination (M = 2.09, SD = .46) than procrastinators (M = 3.87, SD = .58) (see Figure 16); and self-regulated delayers had significantly higher mean values for perceived flow (M = 3.64, SD = .56) than procrastinators (M = 3.12, SD = .56) (see Figure 16).

Table 25

Descriptive Statistics for Behavioral Outcomes by Type of Delay

Dependent Variable	Group	Mean	Standard Deviation	N
Grade Received	Procrastination	4.39	.82	113
	Self-regulated Delay	4.94	.24	50
Irrational Procrastination	Procrastination	3.87	.58	113
	Self-regulated Delay	2.09	.46	50
Flow	Procrastination	3.12	.56	113
	Self-regulated Delay	3.64	.56	50

Table 26

Between-subjects Effects for Behavioral Outcomes

Variable	(F 1, 161)	Significance	Partial Eta Squared
Grade Received	21.78	.000	.119
Irrational Procrastination	365.47	.000	.694
Flow	30.10	.000	.158

Figure 15 Mean Grade Received Score by Type of Delay

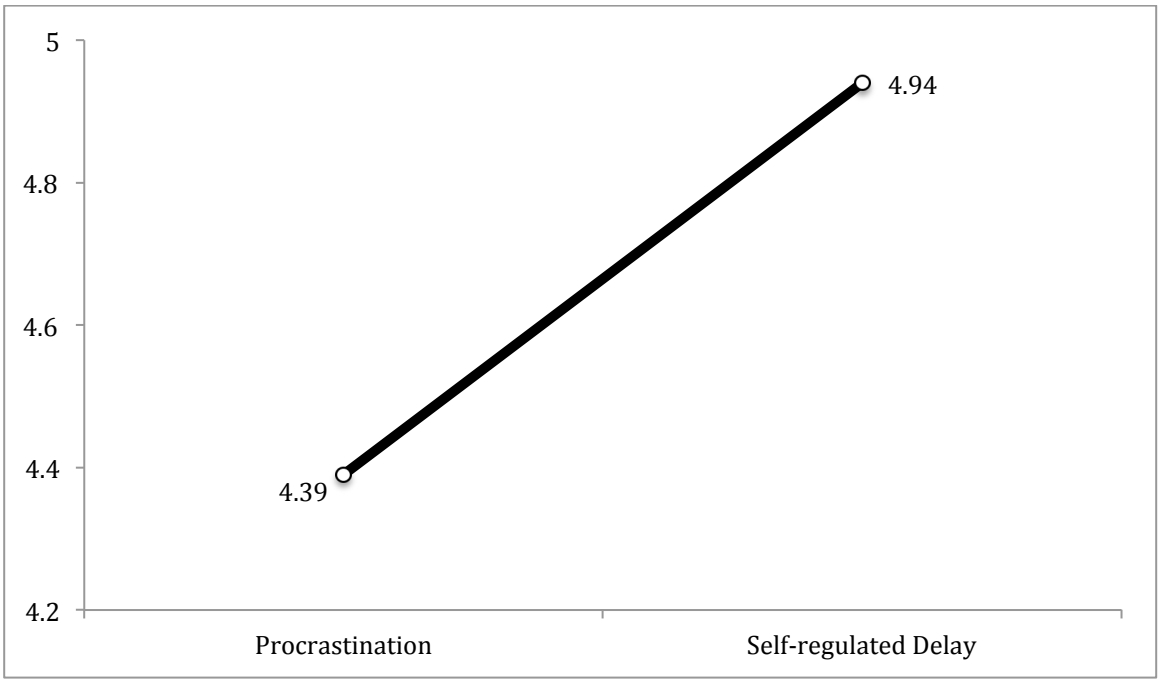


Figure 16 Mean Procrastination Score by Type of Delay

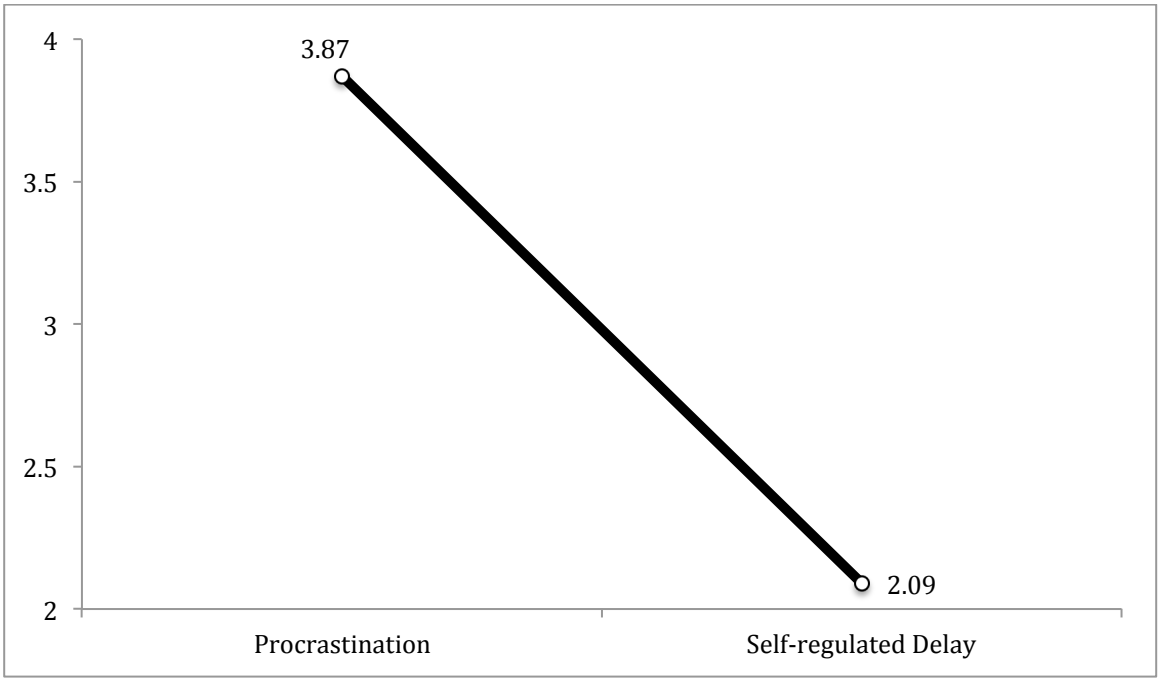
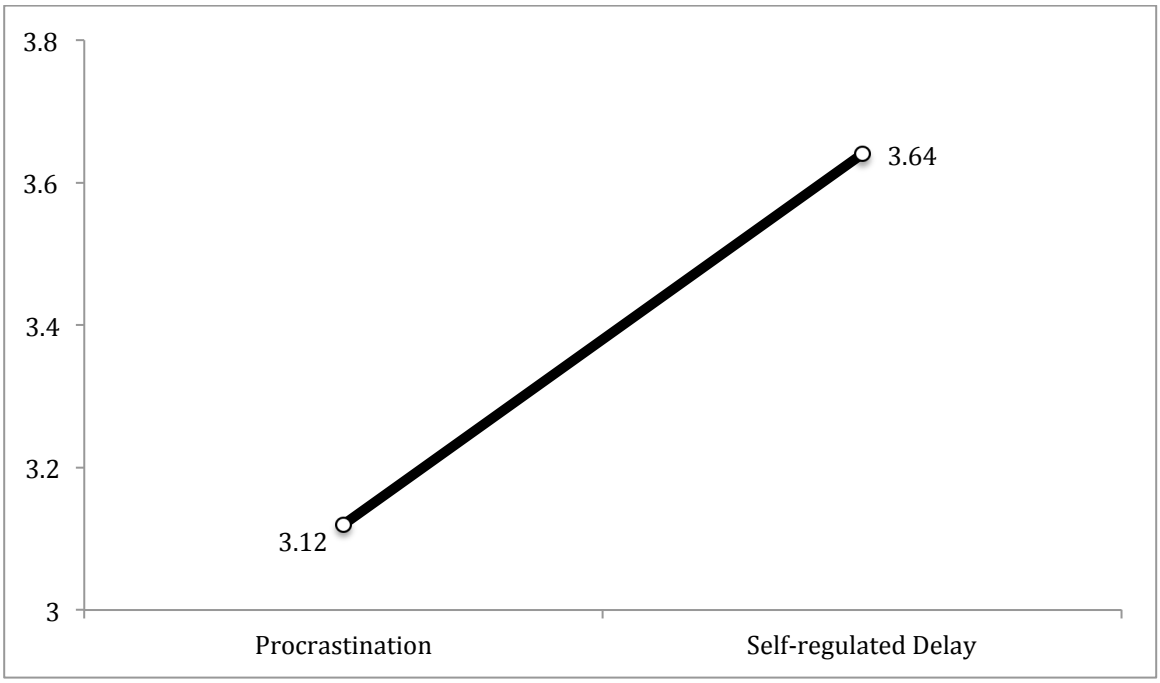


Figure 17 Mean Flow Score by Type of Delay



Research question four: post hoc analyses. To provide further support for the utility of the S-RCATS, the post hoc analyses were also conducted using the composite S-RCATS scores instead of the APS. Since the previous findings from the first research question showed moderately strong, positive and significant correlations between the three S-RCATS subscales (prioritizing, time management, self-monitoring) and the three subscales of the APS (outcome satisfaction, preference for time pressure, ability to meet deadlines), it was expected that the following post-hoc analyses using the self-regulation scale would be similar to the analyses above that used the APS. Using the 228 participants who reported delaying, a median split procedure was conducted to better classify participants as procrastinators or self-regulated delayers. Participants who indicated delaying and who had median or above scores on the IPS (*Mdn* = 3.00) and below median scores on the S-RCATS (*Mdn* = 3.83) were classified as "non-self-regulated

delayers/traditional procrastinators," and (2) participants who indicated delaying and who had median or above scores on the new self-regulation scale and below median scores on the IPS were classified as "self-regulated delayers."

Post hoc self-regulatory differences by type of delay. A one-way between groups multivariate analysis of variance was performed to investigate differences in self-regulatory skills based upon the type of delay in which the student engaged. The three subscales of the S-RCATS (prioritizing, time management, and self-monitoring) were the dependent variables and the type of delay (procrastination, self-regulated delay) was the independent variable (see Table 27 for descriptive statistics). A significant difference was found between the two groups on the combined self-regulatory dimensions, $F(3, 152) = 85.00$, $p < .001$; Wilks' Lambda = .37; partial eta squared = .63. When the results for the dependent variables were considered separately, all three self-regulatory dimensions exhibited statistically significant differences using a Bonnferroni adjusted alpha level of .017 (see Table 28). Results indicated that self-regulated delayers had significantly higher mean values on all three self-regulatory dimensions over procrastinators (see Figures 18-20).

Table 27

Descriptive Statistics for Self-regulatory Dimensions by Type of Delay

Dependent Variable	Group	Mean	Standard Deviation	N
Prioritizing	Procrastination	3.37	.46	111
	Self-regulated Delay	4.31	.40	45
Time Management	Procrastination	3.03	.46	111
	Self-regulated Delay	4.09	.49	45
Self-monitoring	Procrastination	3.48	.41	111
	Self-regulated Delay	4.31	.79	45

Table 28

Between-subjects Effects for Self-regulatory Dimensions

Variable	(*F* 1, 154)	Significance	Partial Eta Squared
Prioritizing	145.27	.000	.49
Time Management	165.76	.000	.52
Self-monitoring	138.24	.000	.47

Figure 18 Mean Prioritizing Skills Score by Type of Delay

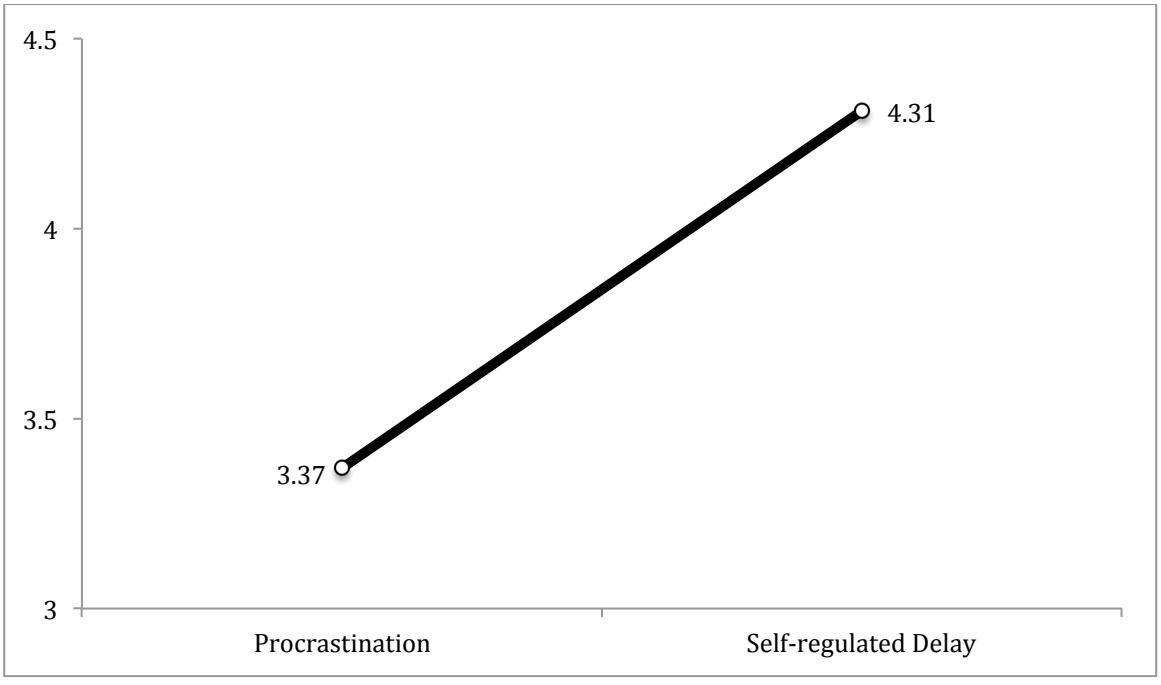


Figure 19 Mean Time Management Skills Score by Type of Delay

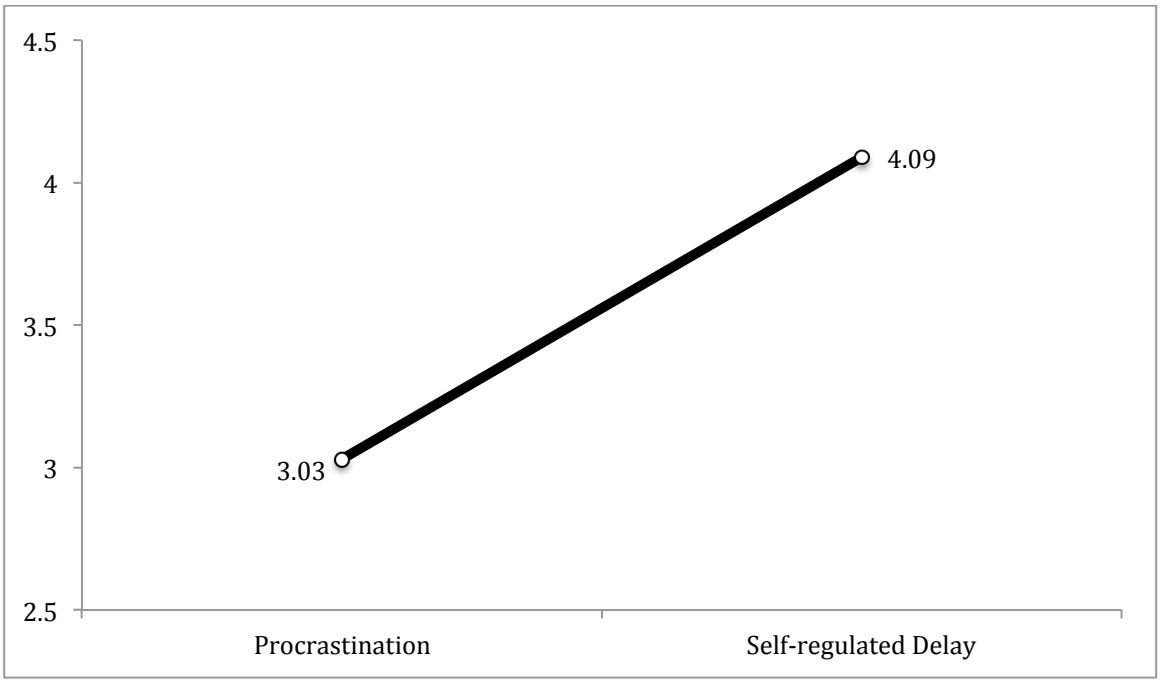
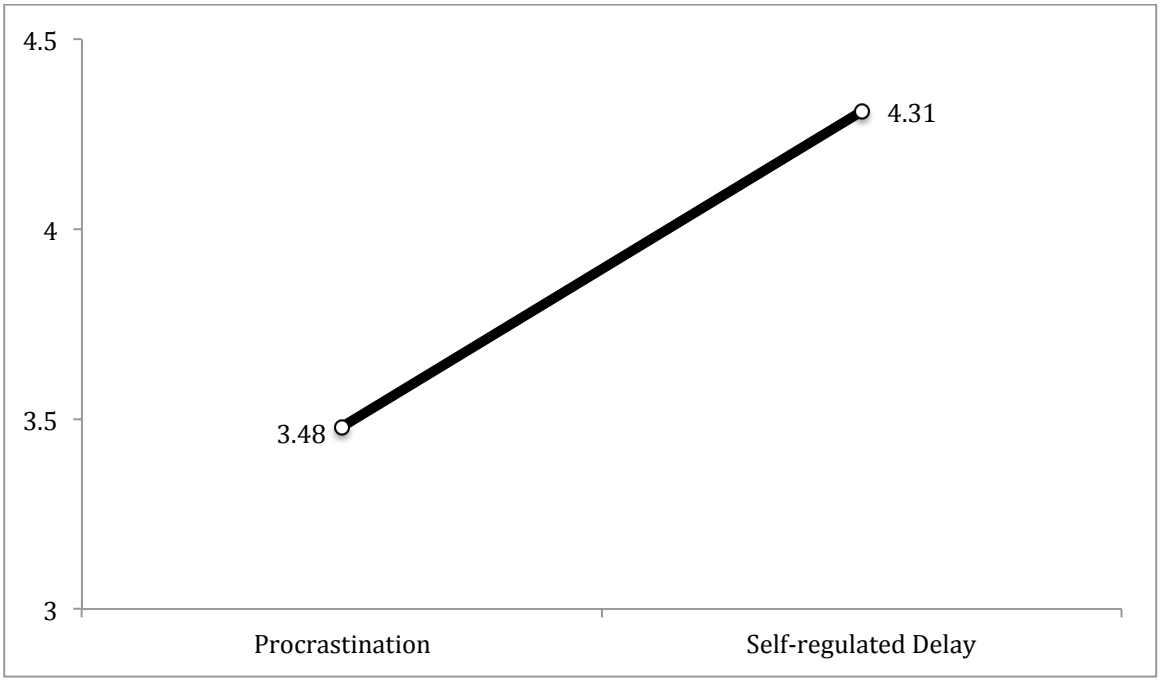


Figure 20 Mean Self-monitoring Skills Score by Type of Delay



Post hoc motivational differences by type of delay. A one-way between groups multivariate analysis of variance was performed to investigate differences in motivational characteristics based upon the type of delay in which the student engaged. Three of the four achievement goal subscales (performance approach, mastery avoidance, mastery approach), perceived instrumentality, and self-efficacy were the dependent variables, and the type of delay (procrastination, self-regulated delay) was the independent variable (see Table 29 for descriptive statistics). The performance avoidance subscale was excluded from the analysis due to the lack of internal consistency among the items of the scale. A significant difference was found between the two groups on the combined motivational dimensions, $F(5, 150) = 10.02$, $p < .001$; Wilks' Lambda = .75; partial eta squared = .25. When the results for the dependent variables were considered separately, all of the motivational dimensions, except performance approach goals, exhibited statistically significant differences using a Bonnferroni adjusted alpha level of .01 (see Table 30). Results indicated that self-regulated delayers had significantly lower mean values for mastery avoidance goals ($M = 2.36$, $SD = 1.10$) than procrastinators ($M = 2.83$, $SD = .92$) (see Figure 21); self-regulated delayers had significantly higher mean values for mastery approach goals ($M = 3.81$, $SD = .91$) than procrastinators ($M = 3.34$, $SD = .92$) (see Figure 22); self-regulated delayers had significantly higher mean values for perceptions of instrumentality ($M = 3.75$, $SD = .95$) than procrastinators ($M = 3.13$, $SD = .89$) (see Figure 23); and self-regulated delayers had significantly higher mean values for elf-efficacy ($M = 90.39$, $SD = 0.78$) than procrastinators ($M = 74.80$, $SD = 18.81$) (see Figure 24).

Table 29

Descriptive Statistics for Motivational Characteristics by Type of Delay

Dependent Variable	Group	Mean	Standard Deviation	N
Performance Approach	Procrastination	3.32	1.02	111
Goals	Self-regulated Delay	3.18	1.20	45
Mastery Avoidance Goals	Procrastination	2.83	.92	111
	Self-regulated Delay	2.36	1.10	45
Mastery Approach Goals	Procrastination	3.34	.92	111
	Self-regulated Delay	3.81	.91	45
Perceived Instrumentality	Procrastination	3.13	.89	111
	Self-regulated Delay	3.75	.95	45
Self-efficacy	Procrastination	74.80	18.81	111
	Self-regulated Delay	90.39	10.78	45

Table 30

Between-subjects Effects for Motivational Characteristics

Variable	(F 1, 154)	Significance	Partial Eta Squared
Performance Approach Goals	.599	.440	.004
Mastery Avoidance Goals	7.39	.007	.046
Mastery Approach Goals	8.40	.004	.052
Perceived Instrumentality	14.79	.000	.088
Self-efficacy	27.21	.000	.150

Figure 21 Mean Mastery Avoidance Goal Scores by Type of Delay

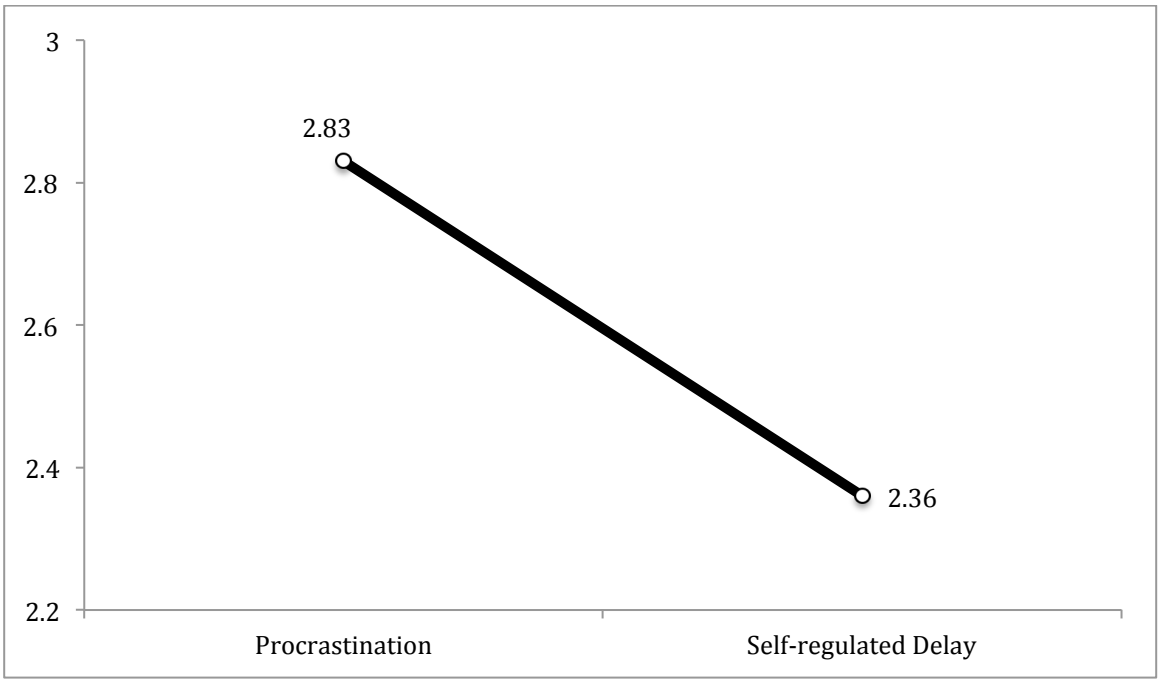


Figure 22 Mean Mastery Approach Goal Scores by Type of Delay

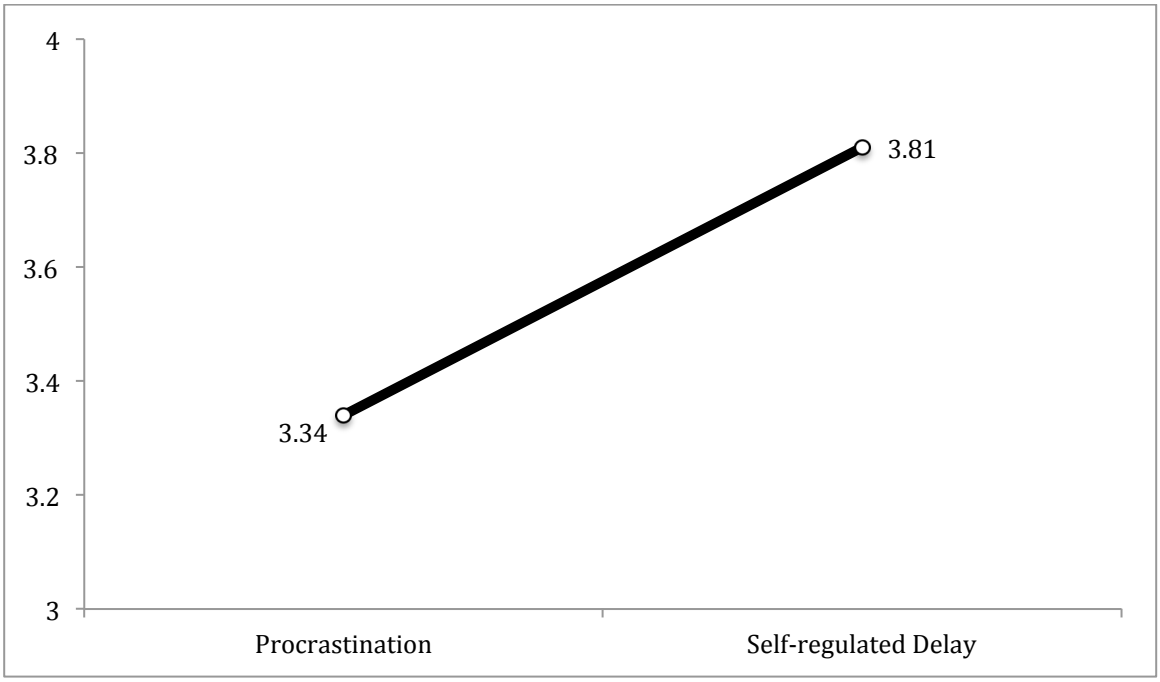


Figure 23 Mean Perceived Instrumentality Score by Type of Delay

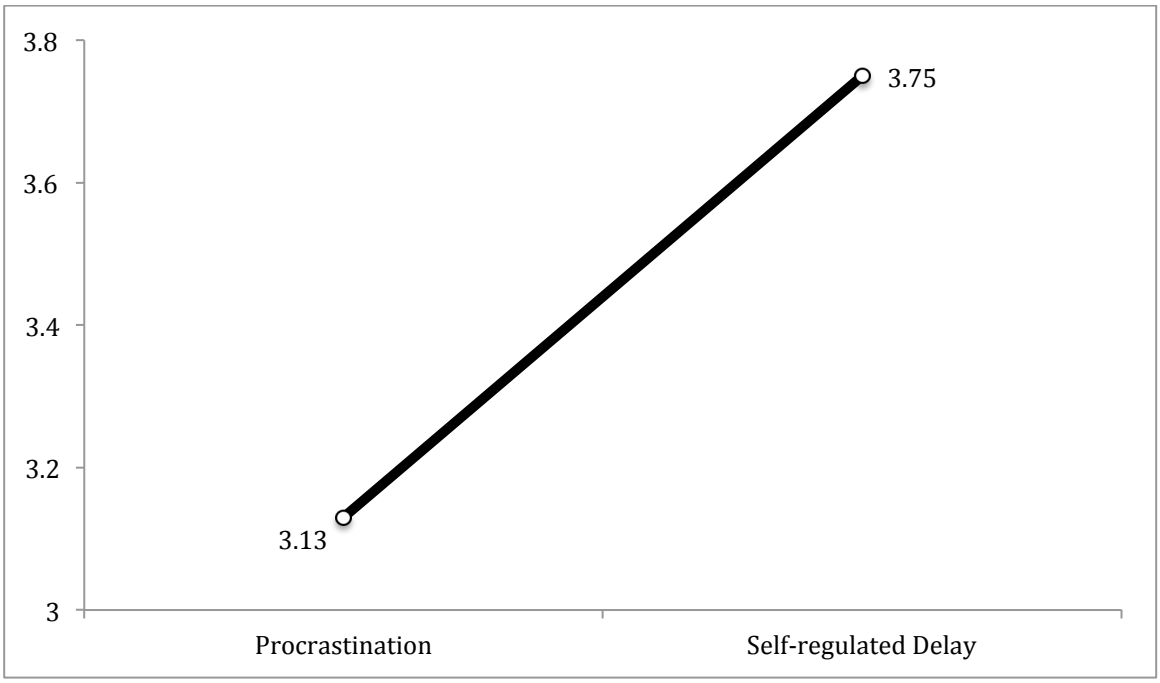
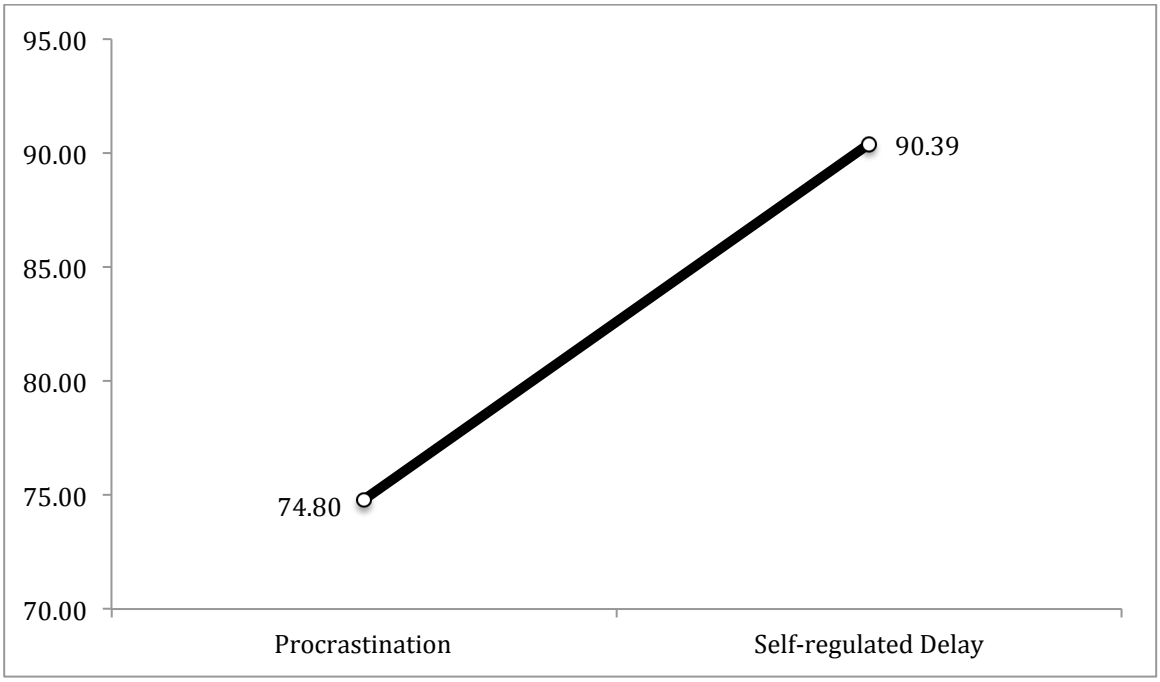


Figure 24 Mean Self-efficacy Score by Type of Delay



Post hoc behavioral differences by type of delay. A one-way between groups multivariate analysis of variance was performed to investigate differences in behavioral characteristics based upon the type of delay in which the student engaged. The grade received, the level of procrastination, and perceived flow experiences were the dependent variables and the type of delay (procrastination, self-regulated delay) was the independent variable (see Table 31 for descriptive statistics). A significant difference was found between the two groups on the combined behavioral dimensions, $F(3, 159) = 119.69$, $p < .001$; Wilks' Lambda = .28; partial eta squared = .72. When the results for the dependent variables were considered separately, all of the behavioral dimensions revealed statistically significant differences using a Bonnferroni adjusted alpha level of .017, grade received, $F(1, 145) = 17.03$, $p < .001$, partial eta squared = .11, procrastination, $F(1, 145) = 321.64$, $p < .001$, partial eta squared = .69, and perceived flow $F(1, 145) = 41.37$, $p < .001$, partial eta squared = .22 (see Table 32). Results indicated that self-regulated delayers had significantly higher mean values for the grade received ($M = 4.91$, $SD = .29$) than procrastinators ($M = 4.38$, $SD = .83$) (see Figure 25); self-regulated delayers had significantly lower mean values for procrastination ($M = 2.13$, $SD = .46$) than procrastinators ($M = 3.86$, $SD = .57$) (see Figure 26); and self-regulated delayers had significantly higher mean values for perceived flow ($M = 3.67$, $SD = .60$) than procrastinators ($M = 3.06$, $SD = .49$) (see Figure 27).

Table 31

Descriptive Statistics for Behavioral Outcomes by Type of Delay

Dependent Variable	Group	Mean	Standard Deviation	N
Grade Received	Procrastination	4.38	.83	103
	Self-regulated Delay	4.91	.29	44
Irrational Procrastination	Procrastination	3.86	.57	103
	Self-regulated Delay	2.13	.46	44
Flow	Procrastination	3.06	.49	103
	Self-regulated Delay	3.67	.60	44

Table 32

Between-subjects Effects for Behavioral Outcomes

Variable	(*F* 1, 145)	Significance	Partial Eta Squared
Grade Received	17.03	.000	.105
Irrational Procrastination	321.64	.000	.689
Flow	41.37	.000	.222

Figure 25 Mean Grade Received Score by Type of Delay

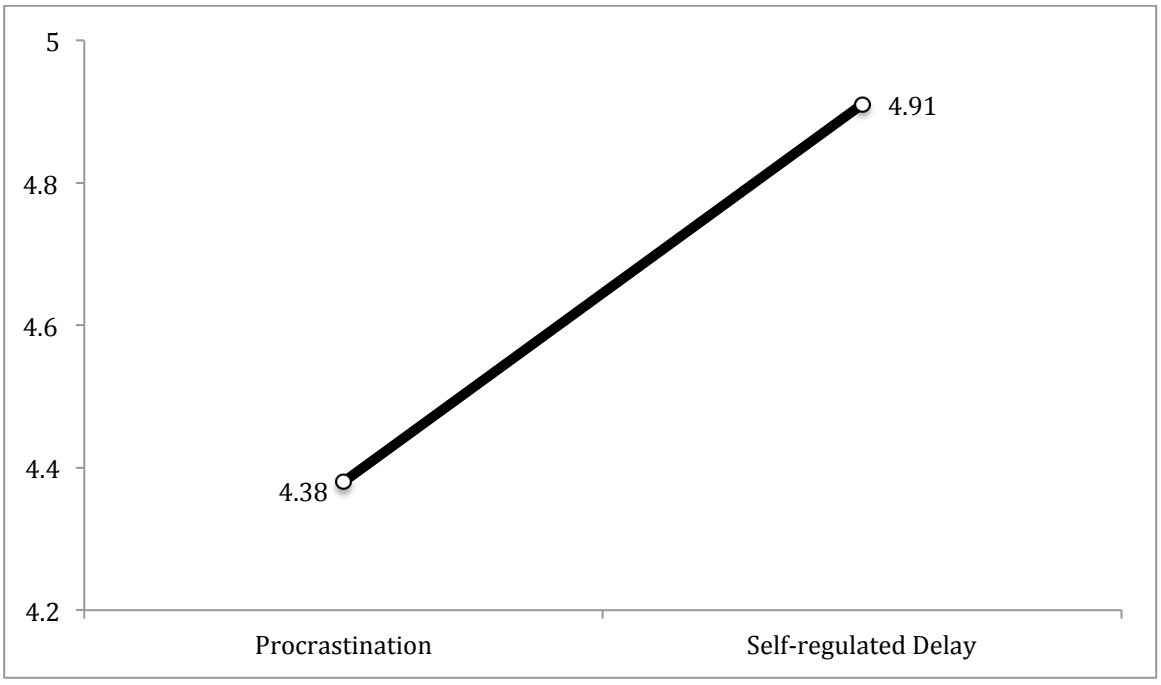


Figure 26 Mean Procrastination Score by Type of Delay

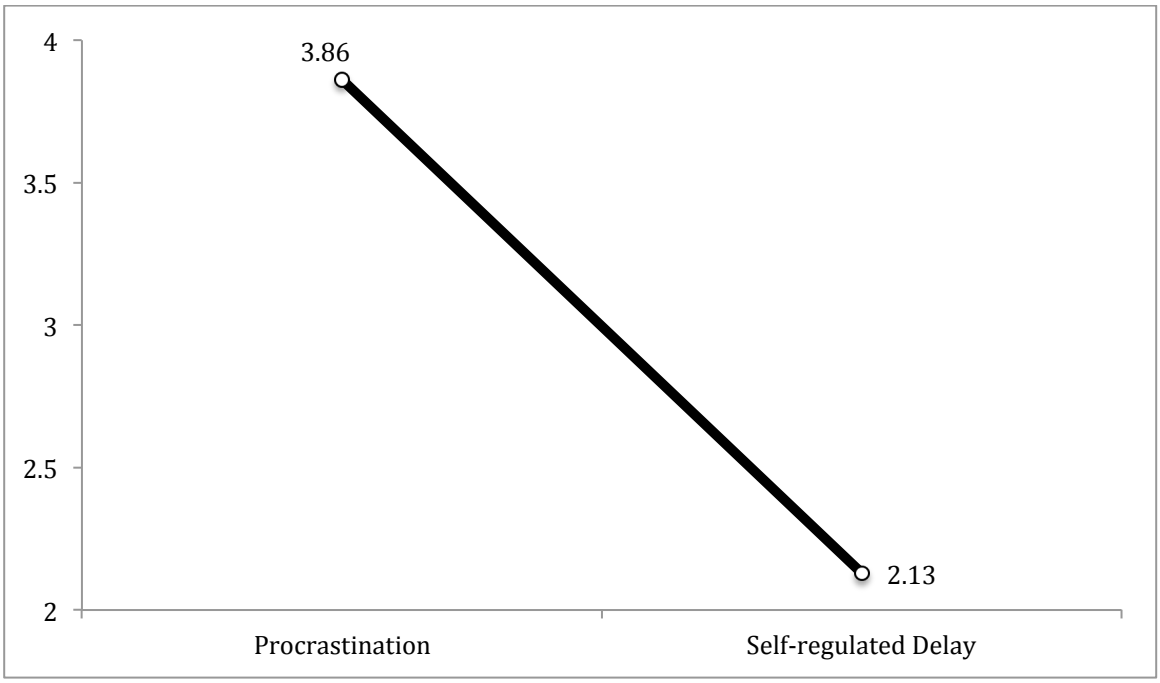
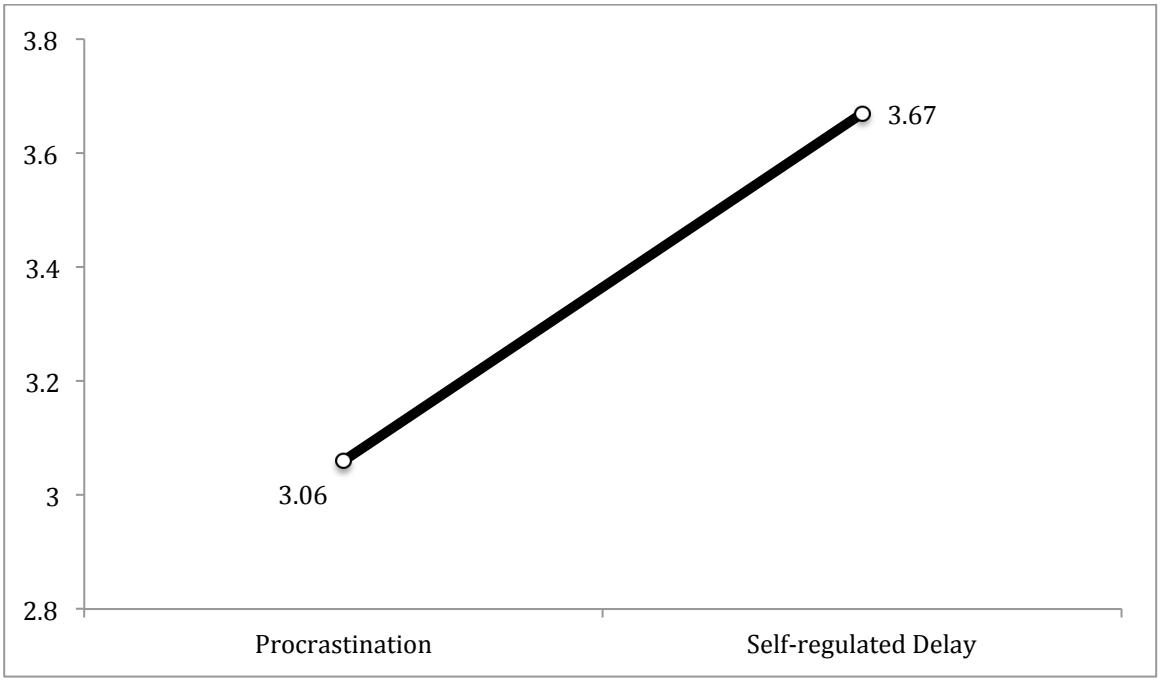


Figure 27 Mean Flow Score by Type of Delay



Chapter 5:

Discussion and Conclusions

The purpose of the current investigation was to better understand academic procrastination and academic delay behaviors from self-regulatory perspective. Specifically, there were two primary objectives of the investigation. The first objective was to test a newly developed scale of self-regulation designed specifically for complex tasks executed over time, in contexts involving multiple other tasks to determine whether the characteristics of active procrastination as measured by the Active Procrastination Scale (APS) were actually related to self-regulation rather than procrastination. This objective was carried out in two steps. In the first step, the self-regulation scale was correlated with other antecedent and outcome variables to support the self-regulatory nature of the Self-regulation for Complex Academic Tasks Scale (S-RCATS). In the second step, the hypothesized relationships between the S-RCATS and the subscales of the APS were tested using correlation and factor analysis.

The second objective was to examine the differences in self-regulatory skills, motivational characteristics, and behavioral outcomes of students who engaged in different types of delay (intentional delay, non-intentional delay) or no delay at all. This objective was to better understand the "intentional delay" aspects of "active procrastination." That is, the investigation sought to determine whether intentional delays could be considered procrastination and if there are beneficial outcomes (e.g., attaining flow, higher grades) that result from intentionally delaying an academic task.

Procrastination is just one of many types of delay behaviors. Nevertheless, researchers have sometimes used the terms procrastination and delay interchangeably. Even the student participants in this study seemed to be unclear about whether they

delayed or procrastinated on a recent academic task—a finding that will be discussed later in further detail. Part of the problem in making a distinction between procrastination and other types of delays has resulted from how procrastination has been defined. Procrastination has been defined as the behavioral act of postponing the initiation of a task that is necessary to complete (Wolters & Corkin, 2012). However, the study of procrastination within academic settings (i.e., academic procrastination) has often been associated with negative learning outcomes such as anxiety, poor performance, and a failure to self-regulate (e.g., Lay & Schouwenburg, 1993; Pychyl & Flett, 2012; Schouwenburg et al., 2004; Steel, 2007; Tice & Baumeister, 1997). As such, academic procrastination is widely considered to be negative and maladaptive.

Recently however, some researchers have suggested that procrastination can be intentional, positive, and adaptive (Choi & Moran, 2009; Chu & Choi, 2005; Schraw, et al., 2007). Yet, others have disputed whether the purported positive and adaptive procrastination behaviors are actually procrastination or if they are another type of delay behavior (Corkin, et al., 2011; Mortensen & Miller, 2012). Furthermore, it remains unclear if intentional delays can be considered to be procrastination. For example, as the results from this investigation point out, many students intentionally delayed beginning academic tasks because of other academic priorities and time constraints, but did not consider such delays procrastination. On the other hand, some students reported intentionally delaying because they were lazy, lacked motivation, or chose to engage in activities that they considered more entertaining (e.g., socializing, watching television). Thus, it seems that some delays are intentional and are guided by an overarching self-regulatory system, whereas, others are merely acts of avoidance—something more akin to traditional forms of procrastination. Below I will summarize the validation of the newly developed S-RCATS as

a measure that captures the defining characteristics of self-regulated delays. I will then describe the evidence showing that the purported positive procrastination (i.e., active procrastination) behaviors are actually self-regulated delay behaviors that differ from procrastination.

Objective One

Confirming the self-regulatory nature of the self-regulation for complex academic tasks scale. The first step of this investigation was to provide support for the self-regulatory nature of the new self-regulation scale by correlating the scale with other antecedent variables that have previously been shown to relate to self-regulation. The results were consistent with previous findings concerning the relationship between self-regulation variables, self-efficacy, achievement goals, and personally valued future goals (Brickman & Miller, 1998; Miller et al., 1996; Miller & Brickman, 2004; Moller & Elliot, 2006; Wolters, 2003, 2004; Zimmerman, 2000). It was found that students who reported higher levels of self-efficacy also had higher levels of self-regulation. At the same time, students who adopted mastery goals and personally valued future goals (i.e., higher perceived instrumentality scores) also had higher levels of self-regulation. Additionally, students who had higher levels of self-regulation were only slightly more likely to adopt performance-approach goals because while self-regulated learners want to perform well, performance is a personal quest rather than a socially oriented outcome. Conversely, while students who had higher levels of self-regulation were less likely to adopt mastery-avoidance goals, the difference with students who had lower levels of self-regulation, failed to reach statistical significance. Since mastery-avoidance goals have been associated with negative learning outcomes (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010),

further research is needed to better understand the reasons for why students with higher levels of self-regulation adopt goals with the purpose to avoid misunderstanding.

The self-regulatory nature of active procrastination. The results from the correlational analyses do support the notion that active procrastination differs from procrastination in terms of the self-regulatory skills that are involved. The notion that active procrastination might be better characterized as a self-regulated delay is supported by three main findings. First, three of the four APS subscales (outcome satisfaction, preference for time pressure, and ability to meet deadlines) were significantly and positively related to three facets of self-regulation (prioritizing, time-management, and self-monitoring). Second, those three APS subscales (outcome satisfaction, preference for time pressure, and ability to meet deadlines) were found to be significantly and inversely related to irrational procrastination. Third, irrational procrastination and the Intentional Decision to Procrastinate subscale of the APS were significantly and negatively related to the three S-RCATS subscales, yet were positively related to one another.

In summary, the positive correlations that were found between three of the APS subscales (outcome satisfaction, preference for time pressure, ability to meet deadlines) and the three subscales of the S-RCATS (prioritizing, time management, self-monitoring), suggest that self-regulation is a major component in the measure of active procrastination. On the other hand, the positive relationship between the intentional decision to procrastinate subscale and the IPS suggests that the Intentional Decision to Procrastinate subscale is measuring something closer to more traditional or irrational forms of procrastination. Similarly, the negative relationships between the Intentional Decision to Procrastinate subscale and the other three subscales suggest that the Intentional Decision to Procrastinate subscale is incongruent with the other three subscales. Thus, making an

intentional decision to procrastinate does not appear to fit within the hypothetical construct of active procrastination because it seems to measure more traditional or irrational forms of procrastination rather than an intentional delay that is done in response to other external demands, tasks, or priorities (e.g., self-regulated delay).

The results from the factor analyses provided further support for the notion that active procrastination is primarily a self-regulation construct that does not seem to involve procrastination. This notion was also supported by three main findings. First, the items from three APS subscales (outcome satisfaction, preference for time pressure, and ability to meet deadlines) and the items from the three S-RCATS subscales (prioritizing, time management, and self-monitoring) loaded strongly and positively on a single factor. Second, the items from the intentional decision to procrastinate subscale of the APS and the items from the three S-RCATS subscales (prioritizing, time management, and self-monitoring) loaded on separate factors. Third, the items from the IPS and the items from the three S-RCATS subscales (prioritizing, time management, and self-monitoring) also loaded on separate factors.

The items comprising the S-RCATS and the items comprising the three APS subscales (outcome satisfaction, preference for time pressure, and ability to meet deadlines) loaded strongly and positively on a single factor, the items from both scales do indeed seem to measure the overarching hypothetical construct of self-regulation. On the other hand, since the items on the S-RCATS loaded on separate factors than the items on the intentional decision to procrastinate subscale and the IPS, suggests that the scales are measuring different hypothetical constructs.

The finding that the APS is related to self-regulation is consistent with previous research (Corkin, et al., 2011). In their study, Corkin et al. (2011) found that active

procrastination was positively related to certain self-regulatory processes (i.e., self-efficacy), but was negatively related to cognitive and metacognitive strategies usage. On the other hand, the results from the current investigation showed that three subscales of the APS were positively related to metacognitive strategies (e.g., prioritizing, time management, self-monitoring). The finding that active procrastination is negatively related to traditional procrastination (i.e., irrational procrastination) is also consistent with previous research (Corkin, et al., 2011). The positive relationship found between the three APS subscales and the three self-regulation subscales in conjunction with the negative relationship found between the three APS subscales and the IPS suggests that active procrastination is not a positive type of procrastination, but rather a delay behavior that is guided by self-regulatory skills. The suggestion that active procrastination would be better described, as self-regulated delay is consistent with other recommendations for describing active procrastination as an active delay (cf., Corkin et al., 2011).

The investigation also provided support for the self-regulatory nature of the new self-regulation scale by correlating the scale with other outcome variables that have previously been shown to relate to self-regulation. The results were consistent with previous findings concerning the relationship between self-regulation variables, task performance, and perceptions of flow (Corkin et al., 2011; Schraw et al., 2007). It was found that students who had higher levels of self-regulation were more likely to have reported perceptions of flow-like experiences as well as received higher grades.

Objective Two

The second objective was addressed in three parts: (a) the examination of differences in self-regulatory skills, motivational characteristics, and behavioral outcomes between students who intentionally delayed, non-intentionally delayed, or did not delay an

academic task; (b) the determination of whether intentional delays could be considered procrastination; and (c) the examination of whether there were perceived benefits (e.g., attaining flow; getting good grades) with intentionally delaying an academic task. Two questions in the initial demographic portion of the data collection were used to determine the type of delay in which participants engaged: did they delay starting the task they were thinking of, and if so, did they do so intentionally. This seemed like a simple, direct way to classify participants' type of delay. However, the initial data analyses revealed that the technique might have been less clear to participants than originally thought. First, a summary of the initial analyses based on the original two-question classifications will be discussed. Second, an alternative classification scheme and related analyses will be discussed. Finally, the findings will be discussed within the context of procrastination and self-regulated delay.

Using the original two-question classification method, an astonishingly high number of students reported delaying the project or paper they had in mind (70%; 228), leaving only 30% (98) of students who reported not engaging in any delay whatsoever. Of those participants that reported delaying, 124 (54%) claimed their delay was intentional. Even though more than half of the participants in this study reported that they intentionally delayed the project or paper they had in mind, according to the self-reported outcomes (i.e., grades) it appeared that the participants were relatively successful despite their delay—a finding that is consistent with Schraw et al. (2007).

Not surprisingly, non-delayers had significantly higher self-regulatory skills, higher levels of self-efficacy, were more likely to adopt mastery-approach goals, engaged in less procrastination, and reported greater perceptions of having flow-like experiences than either of the delay groups. What was surprising was that the intentional delayers were very

similar to non-delayers in terms of their self-regulation, motivation, and behavioral outcomes. Both types of delayers had essentially identical levels of self-regulatory skills pertaining to prioritizing, time management, and self-monitoring. Intentional delayers and non-intentional delayers were also nearly identical in their levels of self-efficacy and procrastination. While intentional delayers reported lower mastery-approach goals and lower perceptions of flow than non-intentional delayers, the mean differences between the two delay groups were not significant. Additionally, intentional delayers had the highest overall mean procrastination scores on the irrational procrastination scale, with 15% (19) of them claiming to procrastinate. They also had the lowest mean grades. On the other hand, non-intentional delayers had nearly identical levels of procrastination as the intentional delayers. In short, the findings from the original classification and analyses were contrary to the research on active procrastination (Choi & Moran, 2009; Corkin, 2011; Chu & Choi, 2005; Mortensen & Miller, 2012; Miller et al., 2004, Schraw et al., 2007; Seo, 2011), and to the intended meaning for "intentional delay."

After reviewing the specific reasons that students gave for delaying, it appeared that the initial classification of intentional and non-intentional delayers might have been faulty and overly simplistic. For example, while there were several intentional delayers who admitted to procrastination, there were also students who intentionally delayed because of other academic tasks and priorities. It was clear that students who engaged in such purposeful and intentional delays did not consider their delays to be procrastination.

Given the strikingly different, as well as the overlapping, reasons that were given for both intentional and non-intentional delays, it appeared that the distinction was overly simplistic. In other words, it seems that some delays resulted from the characteristics of the individual and some delays were born out of circumstance. For example, several students in

both categories of delay admitted that they were procrastinators and cited their procrastination as the reason for their delay. It seems plausible that these students would approach most of their academic assignments in a similar fashion by procrastinating. Additionally, many students in both categories of delay reported that they delayed because of other academic tasks and priorities. Some of these students may have responded to other academic tasks and priorities as needing to make an intentional decision to delay tasks of lesser importance or more distal tasks. On the other hand, some students may not have desired or intended to delay an academic task, but understood that they needed to delay the task to attend to more important or time-sensitive tasks. Therefore, it appears that students in this study have similar confusion with the term procrastination that some researchers have had as well.

Students who delay tasks due to other academic tasks and priorities likely have greater self-regulatory skills and lower levels of procrastination. On the other hand, procrastinators are often characterized as lacking the ability to self-regulate (Lay & Schouwenburg, 1993; Pychyl & Flett, 2012; Steel, 2007; Tice & Baumeister, 1997). Therefore, as a result of the over simplicity in categorizing delayers as intentional or non-intentional, a follow-up post hoc procedure attempted to categorize delayers according to their self-regulation and procrastination.

To identify delayers who were self-regulated delayers and students who were not self-regulated delayers (i.e., procrastinators), a median split procedure was performed using the active procrastination scale and irrational procrastination scale. After reclassifying the delayers, the results revealed two distinct groups with different motivations and outcomes. It was found that self-regulated delayers had higher levels of self-efficacy, were more likely to adopt mastery-approach goals, were less likely to adopt mastery-avoidance goals, had

higher levels of perceived instrumentality, higher mean grades, and greater perceptions of flow than procrastinators.

Since the S-RCATS was designed to provide a more direct measurement of the defining characteristics of self-regulated delays than the APS, a second median split procedure was performed using the S-RCATS instead of the APS. The results were very similar to the previous reclassification using the active procrastination scale, and therefore, provide further support for the viability of the S-RCATS in measuring delays that are guided by an overarching self-regulatory scheme.

Limitations and Future Directions

There are several limitations to the study that should be mentioned. While it was a goal of the study to use a diverse sample by recruiting students from different academic fields, the variability between the types of classes (general education, required, elective) may have made the interpretation of the findings less clear. Therefore, future research will need to more closely examine how the type of class affects how students approach their academic assignments. Additionally, since the sample was predominantly female, it was not possible to make gender comparisons. Consequently, future research will need to be more deliberate in sampling students from classes where there are more equal amounts of males and females to determine what gender differences exist with regard to different types of delay behaviors.

It should be noted that the post hoc median split procedure used to examine the self-regulatory, motivational, and behavioral differences between procrastinators and self-regulated delayers may have led to inaccuracies in identifying students as having engaged in a self-regulated delay or a non-self-regulated delay (i.e., procrastination). However, the procedure was similar to how Chu & Choi (2005) used their APS to classify students in

their sample as either being a passive procrastinator (scores below 4.33) or an active procrastinator (scores above 4.33). It is also important to note that there also were some students who delayed, but did not fall into one of the two categories. Finally, even if students were classified as having engaged in a self-regulated delay, they may still have considered themselves as having engaged in procrastination.

Although the study was able to identify different types of academic delayers, there are some limitations in being able to categorize students accurately, especially when it comes to distinguishing between delays that are intentional from those that are non-intentional. First, students were asked to identify themselves as having made an intentional or non-intentional decision to delay. It is possible that students may have lacked awareness about the reasons for their delay or may have had difficulty accurately reflecting on past cognitions and behaviors. The students' self-reported reasons may have also been biased due to social desirability.

Another attempt was made to reclassify delayers based upon the specific reasons given for delaying. However, reclassifying delayers using this method proved to be more challenging because there were many delayers who could be classified as both procrastinators and self-regulated delayers based on the information they gave. For example, several of the delayers equated procrastination and delay by stating that they procrastinated, but also said that it was because they were working on other more important or timely tasks. Furthermore, it was difficult to determine how to classify students when they merely reported that they were, "busy with other things" because it was unclear if they meant other academic tasks or watching television, for example. Therefore, reclassifying based on the given explanations was determined to be less reliable and valid,

and would have resulted in misclassifications due to the subjectivity involved in trying to force students into a group that they may not have belonged to.

Thus, it will be important for future research to pay close attention to the reasons for academic delays, particularly in trying to understand the reasons for intentional and non-intentional delays. Research that involves qualitative or mixed-method designs will likely be necessary to accurately identify the reasons for intentional and non-intentional delays. It will also be important that future research is careful in distinguishing intentional delays that are purposeful and rational from intentional delays that irrational and detrimental so as not to mistake purposeful delays as positive or adaptive procrastination behaviors. Through the development of the S-RCATS, three defining characteristics of self-regulated delays were identified. It will be beneficial for future research to use the S-RCATS as a platform to develop an instrument that can distinguish between procrastination and self-regulated delays.

Educational Implications

Overall, the results of the investigation point out that some students engaged in delay behaviors and achieved successful outcomes such as obtaining good grades and experiencing intrinsic motivation (i.e., flow). However, some students engaged in delay behaviors (i.e., procrastination) but do not achieve as positive of outcomes as non-delayers and self-regulated delayers. While the results of this investigation showed that self-regulated delayers had significantly higher mean grades and perceptions of flow than the procrastinators, the differences were small (*MD* = .53; *MD* = .61, respectively). Even though many of the procrastinators in this study reported successful outcomes (i.e., passing grades), there were a few students who reported that their project or paper was unsatisfactory. Results from decades of procrastination research have pointed out that on

the whole, procrastination is associated with negative outcomes. Thus, while many procrastinators reported successful outcomes this time, their procrastination may ultimately lead to problems in future. Nevertheless, what can be done to help students who may be struggling with problematic procrastination behaviors that are leading to poor performance outcomes? Clearly, the results suggest that developing self-regulatory strategies are a key component for experiencing academic success whether one engages in delay behaviors or does not delay whatsoever. Therefore, consistent with the recommendations of Schouwenburg et al. (2004), self-regulatory training is likely to be a key intervention strategy for combatting problematic procrastination behaviors.

However, it may not be feasible for teachers to be able to implement self-regulatory trainings in the classroom. Therefore, it will be important for other units in higher education (e.g., academic affairs) to not only provide self-regulatory skill development for new college entrants, but to also provide more tailored or individualized counseling to students who are struggling with problematic procrastination behaviors. While some students may benefit from additional services there are also some potential interventions that could be implemented at the classroom level. For example, teachers need to be reminded about the importance of making the relevance of their assignments more salient to students. The results of this investigation have shown that self-regulation is positively related to perceived instrumentality—a finding that is consistent with previous research as well (Brickman & Miller, 1998; Greene, et al., 2004; Miller et al. 1996; Tabachnick, et al., 2008). That is, when students understand how their coursework is related to their future goals, they are more likely to use self-regulatory strategies (e.g., prioritizing, time management, self-monitoring) and consequently, are less likely to procrastinate.

Conclusion

In conclusion, findings from the investigation provide further support that active procrastination is not procrastination, but rather a form of delay that is characterized by an overarching set of self-regulatory skills that include prioritizing, time-management, and self-monitoring. While Chu and Choi (2005) and Choi and Moran (2009) believed that active procrastinators were characterized as having made intentional decisions to procrastinate, it appears that this is more of a characteristic of procrastinators. Previous research has sometimes mistaken purposeful delays as positive or adaptive procrastination behaviors. However, as this investigation points out, procrastination—intentional or non-intentional—seems to offer students little benefit in helping them achieve higher grades or helping them find their academic tasks to be intrinsically motivating and perceiving them as instrumental towards achieving future goals.

College students often manage many different tasks at the same time, thereby necessitating the need to work on one while putting off another. Some students can delay certain tasks and still be successful, whereas, other students may engage in delay behaviors and experience negative consequences as a result. Therefore, it is important to be able to better understand the characteristics of successful delayers to help students who are plagued by unsuccessful and problematic delays. The results of this investigation highlight the importance of developing self-regulatory skills. Specifically, it is essential that college students are able to: (a) prioritize their tasks according to importance, difficulty, and time-sensitivity; (b) manage their time so that they do not underestimate the time that is needed to complete tasks; and (c) plan effective approaches to tasks, develop an awareness about their abilities, and evaluate their progress towards completing tasks and meeting goals.

The investigation also tested a new measure of self-regulation for complex academic tasks. The findings supported and confirmed the self-regulatory nature of the S-RCATS and determined that the scale was a reliable and valid measure of three important self-regulatory characteristics that help students manage multiple academic tasks to ensure that they will achieve successful outcomes. Furthermore, the S-RCATS provides an alternative to the APS in being able to more directly measure the self-regulatory skills that are involved with certain academic delay behaviors.

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Appendices:

Appendix A: Achievement Goal Questionnaire

While thinking about the project or paper that you have in mind, please answer the following questions. These questions relate to the thoughts and feelings about that task. There are no right or wrong answers. Think about how you felt during the assignment and select the bubble that best matches your experience.

		Not at all true of me				Very true of me
1	It was important for me to do better than other students.	1	2	3	4	5
2	It was important for me to do well compared to others on this assignment.	1	2	3	4	5
3	My goal on this assignment is to get a better grade than most other students.	1	2	3	4	5
4	I worried that I might not learn all that I possibly could on this assignment.	1	2	3	4	5
5	Sometimes I was afraid that I might not understand this assignment as thoroughly as I'd like.	1	2	3	4	5
6	I was often concerned that I may not learn all that there is to learn on this assignment.	1	2	3	4	5
7	I wanted to learn as much as possible from this assignment.	1	2	3	4	5
8	It was important for me to understand the content of this assignment as thoroughly as possible.	1	2	3	4	5
9	I desired to completely master the material presented in this assignment.	1	2	3	4	5
10	I just wanted to avoid doing poorly on this assignment.	1	2	3	4	5
11	My goal on this assignment was to avoid performing poorly.	1	2	3	4	5
12	My fear of performing poorly on this assignment was often what motivated me.	1	2	3	4	5

Appendix B: Achievement Goal Questionnaire Subscales

Subscale and item number	Item
Performance approach	
Q1	It was important for me to do better than other students.
Q2	It was important for me to do well compared to others on this assignment.
Q3	My goal on this assignment is to get a better grade than most other students.
Mastery avoidance	
Q4	I worried that I might not learn all that I possibly could on this assignment.
Q5	Sometimes I was afraid that I might not understand this assignment as thoroughly as I'd like.
Q6	I was often concerned that I may not learn all that there is to learn on this assignment.
Mastery approach	
Q7	I wanted to learn as much as possible from this assignment.
Q8	It was important for me to understand the content of this assignment as thoroughly as possible.
Q9	I desired to completely master the material presented in this assignment.
Performance avoidance	
Q10	I just wanted to avoid doing poorly on this assignment.
Q11	My goal on this assignment was to avoid performing poorly.
Q12	My fear of performing poorly on this assignment was often what motivated me.

Appendix C: Perceived Instrumentality Scale

As you think about the project or paper that you identified earlier, please answer the following questions in relation to the academic project or paper that you have in mind. These questions relate to the thoughts and feelings about that task. There are no right or wrong answers. Think about how you felt during the assignment and select the bubble that best matches your experience.

		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	I did the project/paper assigned in this class because my achievement was important for attaining my dreams.	1	2	3	4	5
2	I did the project/paper assigned in this class because my achievement played a role in reaching my future goals.	1	2	3	4	5
3	I did the project/paper assigned in this class because learning the content played a role in reaching my future goals.	1	2	3	4	5
4	I did the project/paper assigned in this class because learning this material was important for attaining my dreams.	1	2	3	4	5
5	I did the project/paper assigned in this class because understanding this content was important for becoming the person I want to be.	1	2	3	4	5

Appendix D: Flow State Scale

As you think about the project or paper that you identified earlier, please answer the following questions in relation to the academic project or paper that you have in mind. These questions relate to the thoughts and feelings about that task. There are no right or wrong answers. Think about how you felt during the assignment and select the bubble that best matches your experience.

		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	I was challenged, but I believed my skills would allow me to meet the challenge.	1	2	3	4	5
2	I made the correct decisions without thinking about trying to do so.	1	2	3	4	5
3	I knew clearly what I wanted to do.	1	2	3	4	5
4	It was really clear to me that I was doing well.	1	2	3	4	5
5	My attention was focused entirely on what I was doing.	1	2	3	4	5
6	I felt in total control of what I was doing.	1	2	3	4	5
7	I was not concerned with what others may have been thinking of me.	1	2	3	4	5
8	Time seemed to alter (either slowed down or speeded up).	1	2	3	4	5
9	I really enjoyed the experience.	1	2	3	4	5
10	My abilities matched the high challenge of the situation.	1	2	3	4	5
11	Things just seemed to be happening automatically.	1	2	3	4	5
12	I had a strong sense of what I wanted to do.	1	2	3	4	5
13	I was aware of how well I was performing.	1	2	3	4	5
14	It was no effort to keep my mind on what was happening.	1	2	3	4	5
15	I felt like I could control what I was doing.	1	2	3	4	5
16	I was not worried about my performance during the event.	1	2	3	4	5
17	The way time passed seemed to be different from normal.	1	2	3	4	5
18	I loved the feeling of that performance and I want to capture it again.	1	2	3	4	5
19	I felt I was competent enough to meet the high demands of the situation.	1	2	3	4	5
20	I performed automatically.	1	2	3	4	5
21	I knew what I wanted to achieve.	1	2	3	4	5
22	I had a good idea while I was performing about how well I was doing.	1	2	3	4	5
23	I had total concentration.	1	2	3	4	5
24	I had a feeling of total control.	1	2	3	4	5
25	I was not concerned with how I was presenting myself.	1	2	3	4	5
26	I felt like time had stopped while I was performing.	1	2	3	4	5
27	The experience left me feeling great.	1	2	3	4	5
28	The challenge and my skills were at an equally high level.	1	2	3	4	5
29	I did things spontaneously and automatically without having to think.	1	2	3	4	5
30	My goals were clearly defined.	1	2	3	4	5
31	I could tell by the way I was performing how well I was doing.	1	2	3	4	5
32	I was completely focused on the task at hand.	1	2	3	4	5
33	I felt in total control of my body.	1	2	3	4	5
34	I was not worried about what others may have been thinking of me.	1	2	3	4	5
35	At times, it almost seemed like things were happening in slow motion.	1	2	3	4	5
36	I found the experience extremely rewarding.	1	2	3	4	5

Appendix E: Flow State Scale Subscales

Subscale and item number	Item
Challenge-skill balance	
Q1	I was challenged, but I believed my skills would allow me to meet the challenge.
Q10	My abilities matched the high challenge of the situation.
Q19	I felt I was competent enough to meet the high demands of the situation.
Q28	The challenge and my skills were at an equally high level.
Action-awareness merging	
Q2	I made the correct decisions without thinking about trying to do so.
Q11	Things just seemed to be happening automatically.
Q20	I performed automatically.
Q29	I did things spontaneously and automatically without having to think.
Clear goals	
Q3	I knew clearly what I wanted to do.
Q12	I had a strong sense of what I wanted to do.
Q21	I knew what I wanted to achieve.
Q30	My goals were clearly defined.
Unambiguous feedback	
Q4	It was really clear to me that I was doing well.
Q13	I was aware of how well I was performing.
Q22	I had a good idea while I was performing about how well I was doing.
Q31	I could tell by the way I was performing how well I was doing.
Concentration on task at hand	
Q5	My attention was focused entirely on what I was doing.
Q14	It was no effort to keep my mind on what was happening.
Q23	I had total concentration.
Q32	I was completely focused on the task at hand.
Paradox of control	
Q6	I felt in total control of what I was doing.
Q15	I felt like I could control what I was doing.
Q24	I had a feeling of total control.
Q33	I felt in total control of my body.
Loss of self-consciousness	
Q7	I was not concerned with what others may have been thinking of me.
Q16	I was not worried about my performance during the event.
Q25	I was not concerned with how I was presenting myself.
Q34	I was not worried about what others may have been thinking of me.
Transformation of time	
Q8	Time seemed to alter (either slowed down or speeded up).
Q17	The way time passed seemed to be different from normal.
Q26	I felt like time had stopped while I was performing.
Q35	At times, it almost seemed like things were happening in slow motion.
Autotelic Experience	
Q9	I really enjoyed the experience.
Q18	I loved the feeling of that performance and I want to capture it again.
Q27	The experience left me feeling great.
Q36	I found the experience extremely rewarding.

Appendix F: Irrational Procrastination Scale

As you think about the project or paper that you identified earlier, please answer the following questions in relation to the academic project or paper that you have in mind. These questions relate to the thoughts and feelings about that task. There are no right or wrong answers. Think about how you felt during the assignment and select the bubble that best matches your experience.

		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	If there was something I should do, I got to it before attending to lesser tasks.	1	2	3	4	5
2	I did everything when I believed it needed to be done.	1	2	3	4	5
3	I procrastinated.	1	2	3	4	5
4	I delayed the task beyond what was reasonable.	1	2	3	4	5
5	When I should have been doing the task, I did something else.	1	2	3	4	5
6	At the end of the day, I knew I could have spent my time better.	1	2	3	4	5
7	I spent my time wisely.	1	2	3	4	5
8	My life would have been better if I did some activities or tasks earlier.	1	2	3	4	5
9	I put things off so long that my well-being suffered	1	2	3	4	5

Appendix G: Active Procrastination Scale

As you think about the project or paper that you identified earlier, please answer the following questions in relation to the academic project or paper that you have in mind. These questions relate to the thoughts and feelings about that task. There are no right or wrong answers. Think about how you felt during the assignment and select the bubble that best matches your experience.

		Not at all true				Very true
1	My performance suffered because I had to race against the deadline.	1	2	3	4	5
2	I didn't do well because I rushed through the task.	1	2	3	4	5
3	I put things off until the last moment and was not satisfied with my outcome.	1	2	3	4	5
4	I achieved a good result because I completed the task at a slower pace, well ahead of the deadline.	1	2	3	4	5
5	It was really a pain for me to work under the established deadline.	1	2	3	4	5
6	I was upset and reluctant to act when I was forced to work under pressure.	1	2	3	4	5
7	I felt tense and could not concentrate because there was too much time pressure on me.	1	2	3	4	5
8	I was frustrated because I had to rush to meet the deadline.	1	2	3	4	5
9	To use my time more efficiently, I deliberately postponed this task.	1	2	3	4	5
10	I intentionally put off work on this task to maximize my motivation.	1	2	3	4	5
11	In order to make better use of my time, I intentionally put off this task.	1	2	3	4	5
12	I finished this assignment right before the deadline because I choose to do so.	1	2	3	4	5
13	I started this task at the last minute and found it difficult to complete it on time.	1	2	3	4	5
14	I failed to accomplish the goal that I set for myself on this task.	1	2	3	4	5
15	I often ran late on getting things done on this task.	1	2	3	4	5
16	I had difficulty finishing this activity once I started it.	1	2	3	4	5

Appendix H: Active Procrastination Scale Subscales

Subscale and item number	Item
Outcome Satisfaction	
Q1	My performance suffered because I had to race against the deadline.
Q2	I didn't do well because I rushed through the task.
Q3	I put things off until the last moment and was not satisfied with my outcome.
Q4	I achieved a good result because I completed the task at a slower pace, well ahead of the deadline.
Preference for Time Pressure	
Q5	It was really a pain for me to work under the established deadline.
Q6	I was upset and reluctant to act when I was forced to work under pressure.
Q7	I felt tense and could not concentrate because there was too much time pressure on me.
Q8	I was frustrated because I had to rush to meet the deadline.
Intentional Decision to Procrastinate	
Q9	To use my time more efficiently, I deliberately postponed this task.
Q10	I intentionally put off work on this task to maximize my motivation.
Q11	In order to make better use of my time, I intentionally put off this task.
Q12	I finished this assignment right before the deadline because I choose to do so.
Ability to Meet Deadlines	
Q13	I started this task at the last minute and found it difficult to complete it on time.
Q14	I failed to accomplish the goal that I set for myself on this task.
Q15	I often ran late on getting things done on this task.
Q16	I had difficulty finishing this activity once I started it.

Appendix I: Self-efficacy Scale

As you think about the project or paper that you identified earlier, please indicate how certain you were about each of the following aspects of performing the task, using a scale from 0 to 100. Think about how you felt during the assignment and answer the questions by moving the toggle to the number that best matches your experience of working on the project or paper.

1. I knew I could pull together everything I needed to carry out the project/paper.
2. I was confident that I could management my time successfully on the project/paper.
3. I was confident that I could complete the project/paper by the deadline.
4. I was certain I could find all the necessary resources to complete my project/paper.

Appendix J: 23-item Self-regulation for Complex Tasks Scale

As you think about the project or paper that you identified earlier, please answer the following questions in relation to the academic project or paper that you have in mind. These questions relate to the thoughts and feelings about that task. There are no right or wrong answers. Think about how you felt during the assignment and select the bubble that best matches your experience.

		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	I set deadlines for myself when I set out to accomplish the task.	1	2	3	4	5
2	I was good at prioritizing all the tasks that I needed to complete.	1	2	3	4	5
3	I accomplished all of the things I needed to do.	1	2	3	4	5
4	I set priorities to determine the order in which I performed the tasks on the project or paper.	1	2	3	4	5
5	Before I started the project or paper, I determined what I needed to do first.	1	2	3	4	5
6	I finished top priority tasks before going on to less important ones.	1	2	3	4	5
7	I was good at prioritizing all of the tasks that I had to do.	1	2	3	4	5
8	I scheduled tasks in advance.	1	2	3	4	5
9	I did my best to avoid interruptions and distractions.	1	2	3	4	5
10	I accurately estimated the time that it would take to accomplish the task.	1	2	3	4	5
11	I was able to shift my attention if another time-sensitive task arose.	1	2	3	4	5
12	I set deadlines for myself.	1	2	3	4	5
13	I was good at estimating how much time the task would take to complete.	1	2	3	4	5
14	I was good at breaking down complex tasks.	1	2	3	4	5
15	I was aware of the approaching deadline for the task.	1	2	3	4	5
16	I was aware of how I was doing.	1	2	3	4	5
17	It was clear to me what I was doing well.	1	2	3	4	5
18	I could tell how well I was doing.	1	2	3	4	5
19	I made prompt decisions as I worked on the task.	1	2	3	4	5
20	I made decisions based upon the importance of the tasks that I had to do.	1	2	3	4	5
21	I was focused on the task at hand.	1	2	3	4	5
22	I set short-term goals for what I wanted to accomplish.	1	2	3	4	5
23	I was aware of the time that remained to complete the task.	1	2	3	4	5

Appendix K: Self-regulation for Complex Tasks Subscales

Subscale and item number	Item
Prioritizing	
Q1	I set deadlines for myself when I set out to accomplish the task.
Q2	I was good at prioritizing all the tasks that I needed to complete.
Q3	I accomplished all of the things I needed to do.
Q4	I set priorities to determine the order in which I performed the tasks on the project or paper.
Q5	Before I started the project or paper, I determined what I needed to do first.
Q6	I finished top priority tasks before going on to less important ones.
Q7	I was good at prioritizing all of the tasks that I had to do.
Time management	
Q8	I scheduled tasks in advance.
Q9	I did my best to avoid interruptions and distractions.
Q10	I accurately estimated the time that it would take to accomplish the task.
Q11	I was able to shift my attention if another time-sensitive task arose.
Q12	I set deadlines for myself.
Q13	I was good at estimating how much time the task would take to complete.
Self-monitoring	
Q14	I was good at breaking down complex tasks.
Q15	I was aware of the approaching deadline for the task.
Q16	I was aware of how I was doing.
Q17	It was clear to me what I was doing well.
Q18	I could tell how well I was doing.
Q19	I made prompt decisions as I worked on the task.
Q20	I made decisions based upon the importance of the tasks that I had to do.
Q21	I was focused on the task at hand.
Q22	I set short-term goals for what I wanted to accomplish.
Q23	I was aware of the time that remained to complete the task.