PROCRASTINATION AND GOAL-SETTING BEHAVIORS IN THE COLLEGE POPULATION: AN EXPLORATORY STUDY

A Thesis

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By

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TABLES OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

SUMMARY

This study investigates the relationship between procrastination and goal-setting behaviors. Undergraduate students (20 male, 24 female) completed a measure of the Five-Factor Model of personality (Mini-Markers) a test of procrastination (PASS), the Achievement Goal Questionnaire, a goal commitment questionnaire for a specific goal and a goal commitment questionnaire for a non-specific goal. In addition, a measure was created for this study that measures how many incidents of being late the students have had this semester. Also, the students completed three situational questions measuring academic procrastination tendencies. Results showed that procrastination was significantly correlated with lateness (0.410), Neuroticism (-.470), Conscientiousness (0.342), age (-0.361), desire to decrease procrastination (0.741), and reasons for procrastination (0.519). When the Achievement Goal framework was further analyzed, the avoidance aspect of the avoidance/approach axis was significantly, positively correlated with procrastination (0.351). There was no differences in goal commitment for specific and non-specific goals, however low procrastinations showed a higher goal commitment overall than did high procrastinators. For the academic problem solving situations, both the major test vs. non-major test problem and four-week problem showed significant relationships on the amount of time allocated towards work over time. However, the amount of time allocated did not seem to vary according to procrastinator type.

CHAPTER 1: INTRODUCTION

Modern college students are forced to manage a varied array of academic assignments in varied subject areas. Some students may have to mange their time between studying for multiple tests, completing homework assignments, reading assignments, and completing papers and projects, on top of all of their extracurricular activities. With so many activities on students' schedules, they must possess the skills needed to set goals, complete these goals, and avoid procrastination of these goals. Procrastination among college students throughout the world is a prevalent phenomenon. It is generally defined, according to the psychological community, as a voluntary, irrational delay of behavior. Procrastination among college students occurs at alarmingly high rates. Some estimates put the incidence rate of procrastination in college students between 80% and 95% (Ellis and Knaus, 1977). The phenomenon has been widely studied in a variety of contexts, including self-regulatory failure, individual differences, and temporal discounting (Steel, 2007). However, procrastination has never been investigated in specific relation to goal-setting behavior; another skill set particularly important to success in college and careers. Good goal setting behavior has been shown to improve performance in the organizational setting (Ludwig & Geller, 2000). This study investigated, qualitatively and quantitatively, the relationship between goal-setting behaviors and procrastination tendencies in college students.

CHAPTER 2: THEORETICAL GROUNDWORK

2.1 Conceptualizing Procrastination

2.1.1 Active and Passive Procrastination

Research in procrastination has been extensive and extremely varied. Researchers have studied the phenomenon from a variety of perspectives including individual differences, task characteristics, rewards versus punishments (Steel, 2007), procrastination as self-regulation failure (Howell & Watson, 2007), and procrastination in both academic and domestic settings. Conventional perspectives define procrastination as the irrational delay of behavior or tasks (Steel, 2007). The current research evaluated procrastination along this definition; however, it has been studied as a positive construct as opposed to a negative construct (Chu & Choi, 2005). This research draws a distinction between active and passive procrastinators, where active procrastinators show the same procrastination behavior as passive procrastinators, but they demonstrate more "…purposive use of time, control of time, self-efficacy of belief, coping styles, and outcomes including academic performance (Chu & Choi, 2005)." Active procrastinators also had similar GPA scores to those of non-procrastinators despite the fact that active procrastinators do not structure their time nearly as much as either passive procrastinators or non-procrastinators. High procrastinators, however, have generally been found to perform more poorly when compared to low procrastinators (Brothen & Wambach, 2001). Thus, it is more applicable to use the conceptualization of procrastination as self-regulatory failure for the purposes of the current research.

2.1.2 Flow State

One more recent way of explaining procrastination behavior is through the concept of a "flow" state. In the academic setting, students sometimes prefer to work under pressure and in

one large block of time rather than in a larger number of smaller chunks of time (Olafson, Schraw, & Wadkins, 2007). This line of research actually proposes that procrastination, to a certain degree, is more beneficial than detrimental to students. The term "flow" is used to describe an "optimal psychological state" (Lee, 2005) where students become completely immersed in the activity, losing awareness of their surrounding environment and the time that passes. Lee (2005) showed that procrastination in students was primarily predicted by flow experiences as opposed to self-determined or non-self-determined motivation.

2.1.3 Temporal Motivation Theory

Another way of conceptualizing procrastination is with the Temporal Motivation Theory, a model of procrastination developed by Steel & König (2006). It is derived from hyperbolic discounting and the expectancy theory. TMT proposes that procrastination results as a function of the perceived utility of a behavior. In particular, behaviors that are perceived to have low utility are hypothesized to be delayed, whereas behaviors that are perceived to have high utility are enacted without delay.

Steel & König (2006) posit the following formula for determining the utility of a particular task or behavior.

$$\text{Utility} = \frac{E \times V}{\Gamma D}$$

In this formula, "E" refers to the degree of expectancy of the activity and "V" refers to the value of the activity. Theoretically, the higher the expectancy and value, the more desirable the activity becomes. The variable "Γ" refers to the "sensitivity to delay" of the individual. Sensitivity to delay refers to impulsiveness, distractibility, and lack of self-control (Steel, 2007). The higher the sensitivity to delay, the lower the utility of an activity will be. Finally, D refers to how immediately realizable the activity is; the degree to which the activity is temporally

discounted. This theoretical model of procrastination is similar to the model proposed by Rachlin (2000). They both view procrastination as an issue of temporally discounted self-control.

While the TMT theory of procrastination could be quite useful at predicting specific patterns of procrastination among students, no study has been done to establish a weighted relationship between the variables in the equation. Likewise, there have not been any specific instruments or inventories developed to directly measure each of the variables in the context of the TMT theory.

2.1.4 The Planning Fallacy

The planning fallacy refers to the common tendency to underestimate how long it takes to complete certain tasks. In the context of the academic setting this refers to students' abilities to underestimate how long it takes to write papers and lab reports, complete projects, and study for tests. Pychyl, Morin, & Salmon (2000) investigated the relationship between the planning fallacy and procrastination among college students. They found no difference between high and low procrastinators' accuracy in how long it takes to complete assignments. However, they did find that high procrastinators began studying for tests later than low procrastinators and high procrastinators also study less than low procrastinators. The current study investigated students' allocation of time on studying for hypothetical tests and a large semester project. If the results are consistent with Psychyl et al. (2000), then high procrastinators should begin studying later than low procrastinators.

2.1.5 Measuring Procrastination

However, a variety of instruments have been constructed to measure procrastination outside of the context of TMT. Some of these instruments include the Academic Procrastination

Scales (Milgram & Toubiana, 1999), the Adult Inventory of Procrastination (McCrown & Johnson, 1989), General Procrastination Scale (Lay, 1986), Aitken Procrastination Inventory (Aitkin, 1982), the Tuckman Procrastination Scale (Tuckman, 1991), and the Procrastination Assessment Scale – Students (Solomon & Rothblum, 1984). Other instruments not specifically formulated for procrastination studies, such as the NEO-PI-R, have been correlated with these measures of procrastination. The five-factor model of personality traits has been a primary correlate of procrastination measures; and of the five measures, all but Openness have generally been correlated to procrastination measures in varying degrees. Conscientiousness and Neuroticism have consistently been the strongest correlates. According to Steel (2007) procrastination is traditionally conceptualized as low conscientiousness and high self-regulatory failure.

2.2 Goal Setting

Goal setting is considered to be extremely important behavior. Good planning and goal-setting behavior positively affects performance on any task (Neubert, 1998). In an organizational context Ludwig & Geller (2000) found goal-setting interventions to be effective at increasing individual performance. It has a positive effect on performance by providing the feedback and motivation to succeed at work and academic performance. Feedback is especially important as it metaphorically lays down the path for one to walk on; it will guide the recipient in the correct direction. For example, my academic advisor provides weekly feedback on the progress I make on this thesis project. With this feedback, the quality of this thesis project has very likely improved (Locke & Latham, 1990). Perhaps in the academic setting very little feedback is given in classes. In the typical introductory psychology course students will take 3-4 tests plus a final each semester. Students very often postpone studying and reading assignments

and until right before the test, behavior that seems related to both procrastination and failure in goal-setting behavior.

Locke & Latham (2002) have found that goal difficulty and goal specificity are important factors in successful goal-setting behaviors. Performance tends to decrease when goal difficulty is extremely low or extremely high (past a certain difficulty threshold), and when goals are unclear and unspecific. Performance tends to increase when goals are specific and clear. They have also noted that, "Goals have an energizing function." That is to say that when goals are more challenging work effort increases. Thus, students may be more willing to put more work into a more challenging goal early on than a less challenging goal. The confounding variable here, however, is that perhaps more challenging goals also require more work to complete, thus it is less likely that students can afford to procrastinate them as drastically as less challenging goals.

Elliot & McGregor (2001) developed a 2x2 achievement goal framework outlining motivational goals and approaches that students take towards their academic studies. They differentiate between mastery and performance orientation on one axis and approach and avoidance on the other. The approach and avoidance axis can be explained using operant conditioning. Students who are approach oriented are positively reinforced and students who are avoidance oriented are negatively reinforced. The performance/mastery axis explains how the students are reinforced or motivated. Performance oriented students are reinforced by succeeding in their studies (performance-approach) or by avoiding failing in their studies (performance-avoidance). Mastery oriented students are reinforced by mastering the material in their studies (mastery-approach) or by avoiding "…misunderstanding or failing to learn course material (Elliot & McGregor, 2001)."

This theoretical approach to academic study is useful due to its explanation of academic motivation. It explains what the most important goals are for students in college. Because students vary in their motivational orientations, students may show differences in procrastination and goal-setting behaviors.

Locke & Latham (2006) state that performance is a function of both ability and motivation; thus it should follow that students' motivations will influence their performance when applied to setting academic goals. They also conjecture that "Assigning hard goals may not be effective when people view those goals as threatening (Locke & Latham, 2006)." It should follow that it is necessary to assess students' relative commitments to goals. In the case of this study, students' goal commitments were assessed on specific and non-specific goals relating to academic performance.

2.3 The Present Study

Many theoretical models view procrastination in relation to individual differences (personality traits such as conscientiousness and neuroticism); where procrastination behavior actually results from mediating environmental circumstances or self-regulatory behavior. However, I propose a model of procrastination that addresses procrastination behavior as self-regulatory failure resulting from poor goal-setting behaviors. In this case, poor goal-setting behaviors would be a mediating aspect resulting from individual differences but affecting procrastination behavior. Ferrari and Emmons (1995) have concluded that procrastination is related to choosing short-term and pleasurable activities over long-term and more beneficial activities. Rachlin (2000) has come to similar conclusions using the model of temporal discounting. There is evidence (Lasane and Jones, 2000) that people who are more future-oriented (less focus on the short-term) also exhibit better goal-setting behaviors. It follow then

that procrastination and goal-setting behaviors among college students should be negatively correlated. The current research investigated the following hypotheses:

H1: Individual differences in procrastination are significantly, positively related to conscientiousness and significantly, negatively correlated to neuroticism.

H2: Individual differences in procrastination are not significantly related to goal level but are significantly, negatively related to goal commitment.

H3: Individual differences in procrastination are significantly, negatively related to the trajectory of progress in hypothetical situations. Persons high in procrastination were expected to engage in fewer periods of work progress early in the hypothetical assignment period and to engage in more periods of work late in the assignment period compared to persons low in procrastination.

H4: Individual differences in procrastination are significantly related to attributions for achievement as measured by the goal achievement questionnaire (Elliott & McGregor, 2001). Specifically, persons high in procrastination were expected to score higher on the avoidance dimension than the approach dimension.

To date, I am aware of no study that has examined the cognitive-motivational processes or the specific behaviors through which the negative effects of procrastination on achievement occur. The proposed work will provide evidence on this issue and is expected to shed new light on understanding how to develop interventions to help persons high in procrastination to engage in more effective self-regulatory action strategies.

CHAPTER 3: METHODS

3.1 Participants

This study included 44 undergraduate volunteers (20 male, 24 female) recruited from psychology courses at the Georgia Institute of Technology. The minimum age was 18.50 years and the maximum was 23.83 with an average age of 20.01 (SD = 1.38).

3.2 Measures

3.2.1 Broad Personality Traits

The Mini-Markers measures five personality traits: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. According to Higgins, Peterson, Pihl, & Lee (2007), the reliability coefficients of the subscales of the dimensions are respectively .87, .90, .89, .86, and .92. All five traits are extremely broad, encompassing multiple factors within each trait. However, there have been significant results correlating the five factors of personality with other trait constructs such as procrastination. With that said, it is necessary to define the traits as we use them.

Openness roughly corresponds to "intellectual curiosity" or "need for cognition" (Steel, 2007). Steel states that this is the trait most highly correlated with academic ability. However, the relationship between procrastination and openness is non-existent. Thus, it was not expected in this study that any relationship be found.

Conscientiousness refers to the degree of responsibility and motivation. Research has been consistent in finding that conscientiousness is negatively correlated with measures of procrastination, specifically in the realm of academic performance (Higgins, Peterson, Pihl, & Lee, 2007). According to these researchers, conscientiousness seems to be the most relevant personality factor (as measured by the Five-Factor Model) for predicting academic performance.

Extraversion is probably the most commonly referenced trait of the five traits. It refers to optimism, eagerness, excitement, and the overall sociable nature of the individual. Sometimes Extraversion also refers to impulsiveness. Extraversion is complicated because high extraversion generally implies a high amount of energy (lack of lethargy) and can imply a high amount of impulsivity. The latter would imply a lesser degree of procrastination whereas the former would imply a higher degree of procrastination (Steel, 2007). As such, Extraversion usually does not have significant results predicting procrastination.

Steel explains Agreeableness in relation to the clinical literature. He says that, "… rebelliousness, hostility, and disagreeableness are thought to be major motivations for procrastination [implying low levels of Agreeableness]." Agreeableness tends to refer to one's likeability and interpersonal skills. Adjectives such as "warm" and "sympathetic" are often used to describe those who are high in agreeableness. This trait is generally negatively correlated with procrastination.

Neuroticism is commonly referred to as worrying or trait anxiety. It has generally been reported as have a positive correlation with measures of procrastination. Adjectives that describe neuroticism include "temperamental," "touchy," and "moody." One can imagine that higher anxiety would result in higher avoidance behavior; thus procrastination. Thus, neuroticism and procrastination should be positively correlated.

3.2.2 Procrastination

The PASS consists of two parts. The first part of the test measures procrastination in relation to six common academic areas: working on a term paper, studying for an exam, keeping up with weekly reading assignments, performing administrative tasks, attending meetings, and other miscellaneous academic tasks. The second part of the task consists of procrastination

scenarios, and requires the test-taker to signify (using a Likert scale) why they would procrastinate in that given situation. Two options are given in each scenario. Solomon & Rothblum (1988) reported significant validity data for the PASS. Students in a class took self-paced quizzes throughout the semester. Those who reported higher procrastination on the PASS also tended to start and complete the quizzes later in the semester. They also found significant validity results in relation to attending extra credit class sessions for the class.

3.2.3 Achievement Goal Orientation

I used the achievement goal framework developed by Elliott & McGregor (2001) to assess individual differences in goal orientation. Procrastination should be negatively correlated with avoidance motivation and positively correlated with approach motivation. This study did not hypothesize any relationship on the performance/mastery dimension; however, the relationship will be analyzed.

3.2.4 Goal Commitment

Students were given a goal commitment measure (Hollenbeck, Klein, O'Leary, Wright, 1989) to complete for two different goals. One goal is a specific goal of achieving a 3.25 grade-point-average for the semester. The second goal is a non-specific goal of doing what the student considers "very well" this semester.

3.2.5 Academic Problem Solving

Two fill-in-the-blank questions and one multiple-choice question were designed specifically for this experiment. The two fill-in-the-blank questions gave the students a hypothetical academic situation and asked them to answer it how they would normally behave. The first question laid out that the students has exactly a week to study for two upcoming tests, one major test (in a difficult class in their major) and one non-major test (a relatively easy

course). They have a 90% (minimum for an A) in both classes and they need at least a 90% on the test to maintain the A in the classes. However, the students have only 9 hours to allocate to studying for both tests. The students were given a chart and asked to fill in what days they would study for which test and for how long. The total hours had to add up to 9 hours.

The second fill-in-the-blank question was similar to the first, only broader in scope. The students were told that they have a large project due in four weeks in a class on which both professors and prospective employers place a large emphasis. The project generally takes 30 hours to complete, and the students have only 4 weeks in which to complete it (they have not yet started on the project). They were asked to fill in how many hours each week they would work on the project.

The multiple-choice question also involved a hypothetical situation. Participants were told that it is Friday afternoon and that they have a large paper due on Monday morning. However, they also have a very important social event that night which they have been looking forward to all semester. They were asked what they would do in this situation, and they were given 9 choices from which to select. The choices the participants had included the following:

Choice 1: *Skip the social event and work on the paper.*

Choice 2: *Work on the paper and go late to the social event.*

Choice 3: *Go to the social event and leave early to work on the paper.*

Choice 4: *Go to the social event and stay up late to work on the paper when you return.*

Choice 5: *Go to the social event and get up early the next day to work on the paper.*

Choice 6: *Go to the social event and get up early or stay up late on Saturday or Sunday night or Sunday morning to work on the paper.*

Choice 7: *Go to the social event and get up early Monday morning to work on the paper.*

Choice 8: *Write your professor to request an extension and go to the social event hoping to get the extension.*

Choice 9: *Write your professor to request an extension and go to the social event only after you are granted the extension.*

3.3 Procedure

All of the measures were collated into one packet which all of the participants filled out. The order of the measures in the packet was consistent across participants. They first filled out demographic information including age, ethnicity, year in college, college GPA, major/discipline, and the lateness scale. Next they completed the Mini Markers survey, the PASS, and the Achievement Goal Questionnaire. They then completed the goal commitment questionnaire for the non-specific goal and then for the specific goal. Three academic problem-solving questions, specifically designed for this experiment, were located in the final part of the survey packet. They were first given the question involving the two tests, then the social situation, and finally the project situation. The one session was scheduled for one hour, however most participants finished in 20 to 30 minutes.

CHAPTER 4: RESULTS

4.1 Procrastination

The Procrastination Assessment Scale – Students (PASS) was used to measure procrastination. The PASS is composed of two parts. The first part consists of seven different subscales. The first two questions from each subscale are summed to acquire the generic procrastination score. The last question from each subscale is summed to achieve the participant's desire to decrease their procrastination tendencies. Participants' had a possible score range of 7 to 35, and an observed range of 11 to 29. The average was 18.18 (SD = 5.09). The second part of the PASS measures each participant's probable reasons for procrastination. The possible range for participants was 26 to 130. The observed range was 31 to 75 with an observed average of 58.80 (SD = 11.86).

The original procrastination score was slightly bimodal, so a logarithmic transformation was done on the procrastination score. The results provided an average transformed procrastination score of 1.53 (SD = 0.085). The range of values was from 1.32 to 1.69. To more easily observe the relationship between procrastination and the other variables, participants were organized into low, medium, and high procrastinators. All participants one SD or more below average were categorized as low procrastinators ($n = 6$) and all participants one SD or more above average were categorized as high procrastinators ($n = 11$). The rest of the participants were categorized as medium procrastinators ($n = 27$).

4.2 Exploratory Variables

The exploratory variables include the lateness scale developed for this experiment, age, and GPA (grade-point-average). Lateness was a measure of the number of times participants have been late this semester. All three variables were correlated with the transformed

procrastination score. Table 1 shows the correlations between the four variables. Lateness was positively correlated with procrastination ($r = 0.410$, $p < 0.01$) and age, not originally included in the hypotheses, was negatively correlated with procrastination ($r = -0.394$, $p < 0.01$). There was no significant relationship between GPA and procrastination.

Table 1. Exploratory Variables and Procrastination.

	Procrastination	Lateness	Age	GPA
Procrastination	-	0.410**	-0.394**	-0.006
Lateness	0.410**	-	-0.250	0.097
Age	-0.394**	-0.250	-	0.128
GPA	-0.006	0.097	0.128	-

* Indicates significance at $p < 0.05$

** Indicates significance at $p < 0.01$

4.3 The Big Five

The five dimensions of The Big Five were all correlated with the procrastination score. Only two dimensions showed significant correlations; conscientiousness ($r = 0.342$, $p < 0.05$) and neuroticism ($r = -0.470$, $p < 0.01$). However, neuroticism was negatively correlated with procrastination, contrary to the study's initial expectations. This implies that lower procrastinators were more highly neurotic or less emotionally stable – a result contrary to the majority of procrastination studies. Procrastination was insignificantly and negatively correlated with Extraversion ($r = -0.179$, $p > 0.05$), Openness ($r = -0.084$, $p > 0.05$), and Agreeableness ($r = -0.056$, $p > 0.05$). Table 2 shows all of the correlations with procrastination as well as the correlations between the traits. It should also be noted that Conscientiousness was significantly and negatively correlated with Extraversion ($r = -0.452$, $p < 0.01$), Agreeableness ($r = -0.397$, p

< 0.01), and insignificantly and negatively correlated with Openness (r = -0.188, p > 0.05), and Neuroticism (r = -0.131, p > 0.05). It was predicted that correlation be negatively correlated with neuroticism as it is generally positively correlated with procrastination and conscientiousness is negatively related with procrastination.

Table 2. The Big Five and Procrastination.

	Procrastination	Extraversion	Agreeableness	Neuroticism	Conscientiousness	Openness
Procrastination	-	-0.179	-0.056	-0.470**	0.342*	-0.084
Extraversion	-0.179	-	0.151	-0.049	-0.452**	0.128
Agreeableness	-0.056	0.151	-	0.231	-0.397**	0.077
Neuroticism	-0.470**	-0.049	0.231	-	-0.131	-0.126
Conscientiousness	0.342*	-0.452**	-0.397**	-0.131	-	-0.188
Openness	-0.084	0.128	0.077	-0.126	-0.188	-

* Indicates significance at $p < 0.05$

** Indicates significance at $p < 0.01$

4.4 Achievement Goal Orientation

In the initial analysis the four dimensions of the Achievement Goal framework (Performance-Approach, Mastery-Avoidance, Mastery-Approach, and Performance-Avoidance) were correlated with procrastination. Table 3 shows the correlations between the four orientations and procrastination. None of the four achievement goal orientations showed any significant correlations with procrastination. Procrastination was negatively correlated with Performance-Approach (r = -0.001, p > 0.05) and Mastery-Approach (r = -0.143, p > 0.05) and positively correlated with Performance-Avoidance (r = 0.272, p > 0.05) and Mastery-Avoidance (r = 0.161, p > 0.05).

Table 3. Achievement Goal Orientations and Procrastination.

	Procrastination	Performance - Approach	Mastery - Avoidance	Mastery - Approach	Performance - Avoidance
Procrastination	-	-0.001	0.161	-0.143	0.272
Performance - Approach	-0.001	-	-0.022	0.255	0.034
Mastery - Avoidance	0.161	-0.022	-	0.232	-0.213
Mastery - Approach	-0.143	0.255	0.232	-	-0.118
Performance - Avoidance	0.272	0.034	-0.213	-0.118	-

* Indicates significance at $p < 0.05$

** Indicates significance at $p < 0.01$

In order to analyze the prediction that procrastination would be negatively correlated to the avoidance dimension and to further investigate the relationship between procrastination and the Achievement Goal framework, a repeated measures analysis was completed. Scores were collapsed across the Performance/Mastery axis to obtain Avoidance and Approach scores, and scores were collapsed across the Avoidance/Approach axis to obtain Performance and Mastery scores. Table 4 shows the initial correlations between these four scores and procrastination.

Table 4. Individual Achievement Goal Dimensions and Procrastination.

	Procrastination	Approach	Avoidance	Peroformance	Mastery
Procrastination	-	-0.076	0.351*	0.202	0.037
Approach	-0.076	-	0.042	0.525**	0.466**
Avoidance	0.351*	0.042	-	0.547**	0.409**
Performance	0.202	0.525**	0.547**	-	-0.083
Mastery	0.037	0.466**	0.409**	-0.083	-

* Indicates significance at $p < 0.05$

** Indicates significance at $p < 0.01$

The repeated measures analysis was run between procrastinator type (low, medium, and high). The results showed a significant interaction between procrastination and the avoidance/approach axis ($p = 0.029$), an insignificant main effect of avoidance/approach ($p = 0.091$), and a significant main effect of procrastination ($p = 0.008$). Figure 1 depicts the avoidance/approach scores as a function of procrastinator type (plotted with standard error).

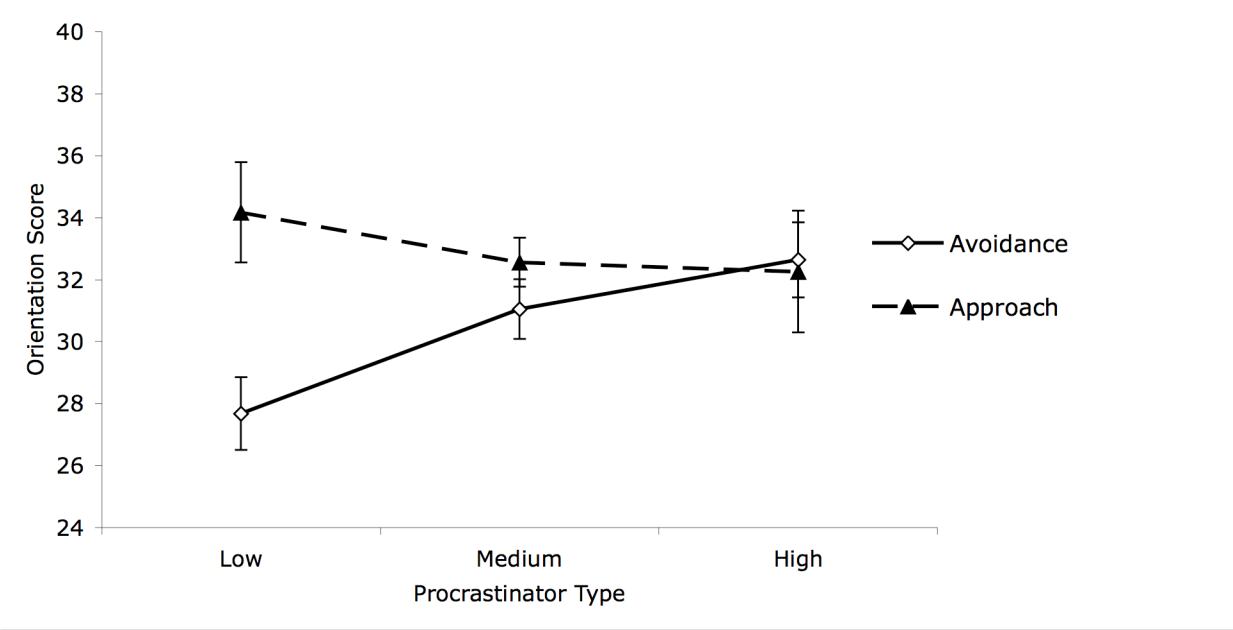

Figure 1. Avoidance/Approach scores as a function of Procrastinator Type.

The second repeated measures analysis was run on the performance/mastery axis as a function of procrastinator type. Unlike the avoidance/approach analysis, this analysis was not significant ($p = 0.678$). In addition, there were no significant main effects of the performance/mastery axis ($p = 0.690$) and procrastinator type ($p = 0.856$). Figure 2 depicts the performance/mastery scores as a function of procrastinator type (plotted with standard error).

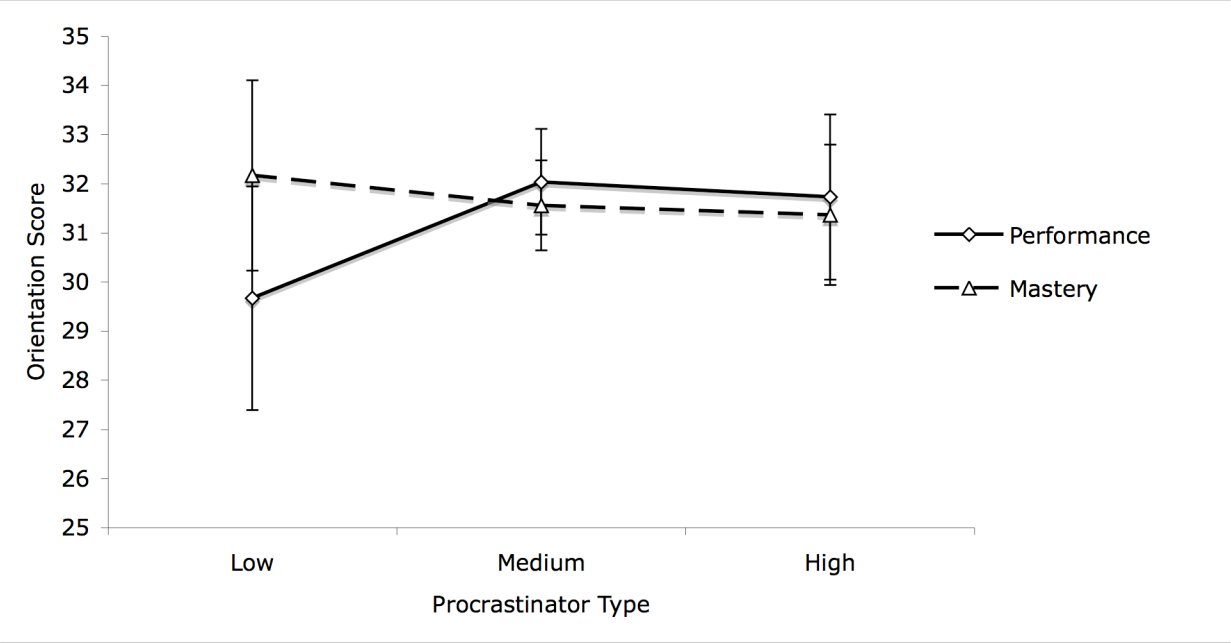

Figure 2. Performance/Mastery scores as a function of Procrastinator Type.

4.5 Goal Commitment

Goal commitment scores were summed for each participant, divided by specific and non-specific goals, and correlated with procrastination score. Table 5 reports the correlations between goal commitment and procrastination.

Table 5. Goal Commitment and Procrastination.

	Procrastination	Non-Specific Goal	Specific Goal
Procrastination	-	-0.275	-0.203
Non-Specific Goal	-0.275	-	0.607**
Specific Goal	-0.203	0.607**	-

* Indicates significance at $p < 0.05$

** Indicates significance at $p < 0.01$

Procrastination was negatively correlated with both specific (r = -0.203, p > 0.05) and non-specific (r = -0.275, p > 0.05) goals as predicted. However, neither correlation was significant. To further investigate the relationship between these variables, a paired samples t-test was run to assess whether there was a significant difference between commitment on the specific and non-specific goals. The t-test revealed no significant difference between commitment on specific and non-specific goals (t = -0.768, p = 0.447). Goal commitment may have varied as a function of procrastinator type, so a repeated measures analysis was run to assess the relationship. The repeated measures did not discover any significant interaction (p = 0.381) between procrastinator type and goal commitment, nor did it find a significant main effect of goal commitment (p = 0.981) and procrastinator type (p = 0.094). While no significance was revealed between the two variables, it should be noted that there is a general negative relationship between goal commitment and procrastinator type (reflected in the negative correlation). Figure 3 shows the overall relationship between the two variables.

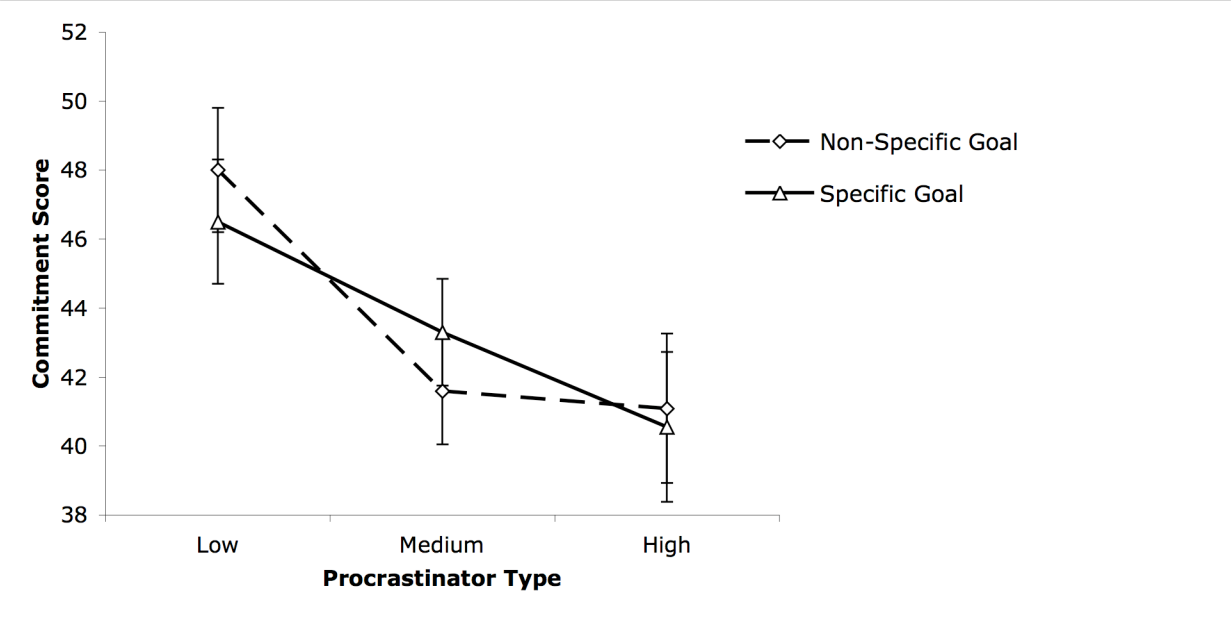

Figure 3. Goal Commitment as a function of Procrastinator Type.

4.6 Academic Problem Solving

4.6.1 Major Test vs. Non-Major Test

As mentioned in the procedure, this problem involved students allocating 9 hours of study time between a test in a difficult class in their major and a test in a less difficult class not in their major. Across procrastinator types and procrastination scores, students had a mean hour allocation of 5.97 hours (SD = 0.8449) on the major test and a mean hour allocation of 3.03 hours (SD = 0.8449) on the non-major test. In order to analyze the significance of these descriptive statistics, a paired samples t-test was run to assess whether or not the differences in hours studied were significantly different on the major test and non-major test when collapsed across procrastination. The t-test showed a significant difference between the hours allocated to the major test and non-major test ($t = 11.508$, $p < 0.001$). Figure 4 shows the relationship between test type and procrastinator type. The figures shows that the number of hours allocated was consistent across procrastinator type – that different types of procrastinators did not seem to allocate a significantly different number of hours.

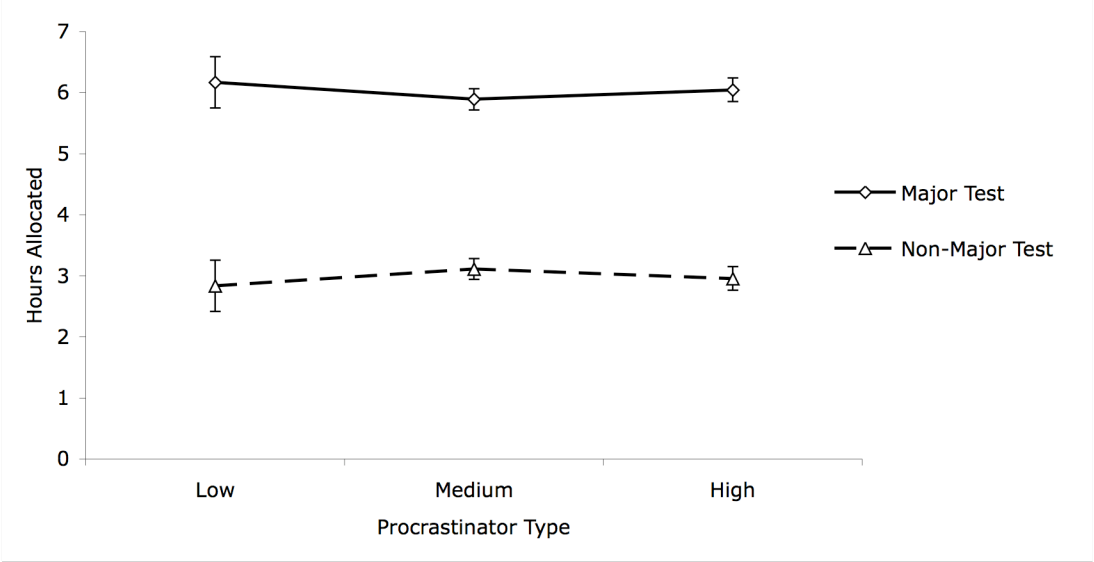

Figure 4. Hours allocated by Test Type and Procrastinator Type.

It was also necessary to analyze how different procrastinators distributed the 9 hours across the days of the week. In order to do this, the data was collapsed across test type (as we already showed that there was no difference in hour allocation among different types of procrastinators). Figure 5 shows hour allocation by day and procrastinator type.

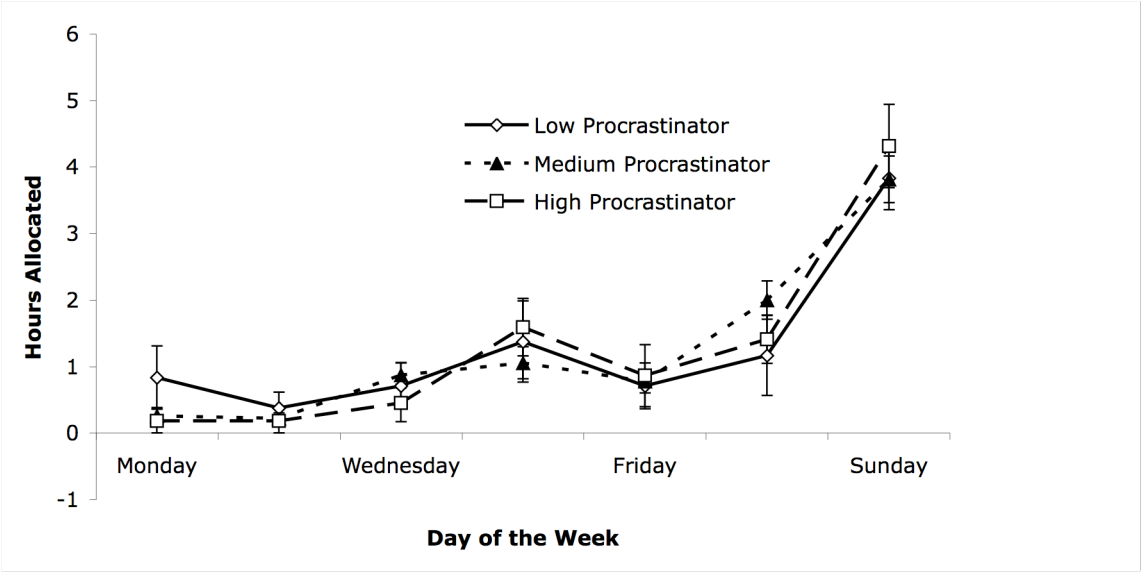

Figure 5. Hours allocated each day of the week according to Procrastinator Type.

A repeated measures test was run on the procrastinator types and days of the week. The results indicated a significant main effect of the days of the week ($p < 0.001$) and an insignificant interaction between the days of the week and procrastinator type ($p = 0.714$). No main effect of procrastinator type could be calculated.

4.6.2 Social Situation

The social situation choices were analyzed by the frequency at which each choice was selected among all participants and among the different procrastinator types. Table 6 shows the frequency at which each choice occurred among low, medium, and high procrastinators as well as the frequency at which they occurred across procrastinator types.

Table 6. Choice Frequency of Social Situation choices by Procrastinator Type.

Choice	Low Procrastinator	Medium Procrastinator	High Procrastinator	Total
Skip the social event and work on the paper	16.7% (1)	22.2% (6)	18.2% (2)	20.5% (9)
Work on the paper and go late to the social event	50.0% (3)	25.9% (7)	18.2% (2)	27.4% (12)
Go to the social event and leave early to work on the paper	0.0% (0)	11.1% (3)	0.0% (0)	6.8% (3)
Go to the social event and stay up late to work on the paper when you return	16.7% (1)	0.0% (0)	9.1% (1)	4.5% (2)
Go to the social event and get up early the next day to work on the paper	0.0% (0)	7.4% (2)	18.2% (2)	9.1% (4)
Go to the social event and get up early or stay up late on Sat. or Sun. night, or Sun. morning to work on the paper	16.7% (0)	29.6% (8)	36.4% (4)	27.4% (12)
Go to the social event and get up early Mon. morning to work on the paper	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Write your professor to request an extension and go to the social event hoping to get the extension	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Write your professor to request an extension and go to the social event only after getting the extension	0.0% (0)	3.7% (1)	0.0% (0)	2.3% (1)

According to the frequency data, 66.7% of low procrastinators, 48.1% of medium procrastinators, and 36.4% of high procrastinators picked the first two options. That is, a much larger percentage of low procrastinators began work on their project at an earlier time. It is also important to note that a much lower percentage of low procrastinators (16.7%) opted to go to the

social event and begin work on their paper at a later date than did medium procrastinators (37.0%) and high procrastinators (54.6%).

4.6.3 Four-Week Situation

The participants had to allocate a certain number of hours each week to the 30-hour hypothetical construct. Figure 6 depicts the hours allocated each week by procrastinator type (plotted with standard error).

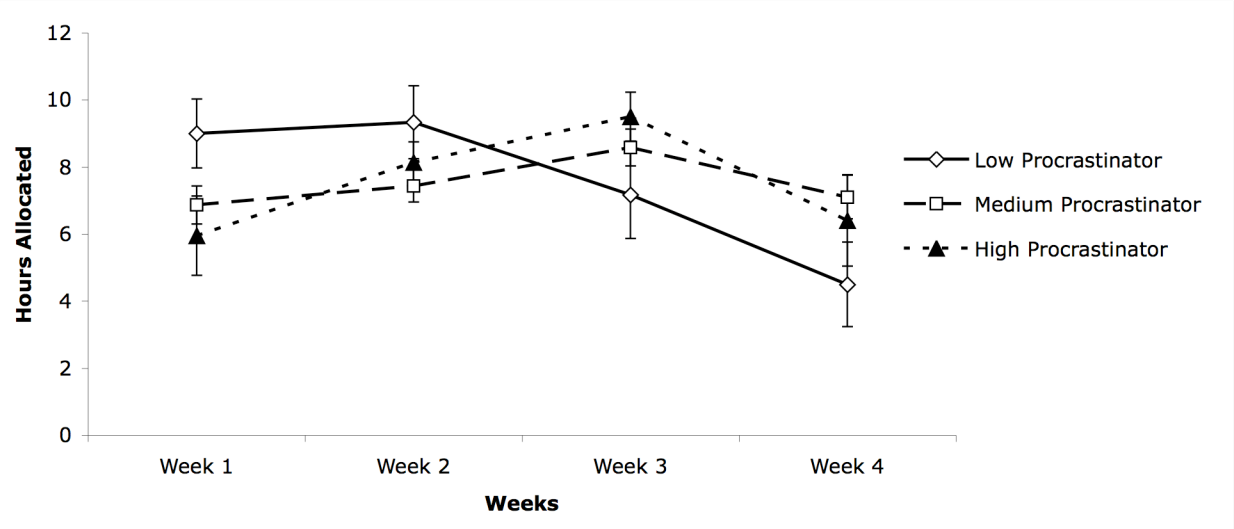

Figure 6. Hours allocated towards project by Procrastinator Type.

Low procrastinators showed a higher amount of work earlier in the four weeks and lower amounts of work later in the four weeks than high procrastinators. A repeated measures was run to assess the degree of significance of the relationship. There was a significant main effect of the week ($p = 0.029$) and an insignificant interaction between week and procrastinator type ($p = 0.215$). A test of within-subjects contrasts revealed a significant quadratic contrast for the week ($F = 12.42$, $p = 0.001$).

4.7 Regression Analysis

A linear regression analysis was completed to attempt to account for the variance in procrastination scores. Only variables with significant correlations were used in the regression analysis, except the desire to decrease procrastination scores. Theoretically, someone's desire to decrease his or her procrastination tendencies should arise out of a tendency to procrastinate in the first place. Thus, their desire to decrease their procrastination tendencies would not directly contribute to their procrastination score. The variables used in the regression analysis were age, lateness, neuroticism, conscientiousness, reasons for procrastination, and avoidance orientation. The regression proved to be significant ($f = 7.664$, $p < 0.001$), with $r = 0.744$ and $r^2 = 0.554$ and an adjusted $r^2 = 0.482$. Thus, approximately half of the variance among procrastination scores was accounted for by the six variables.

CHAPTER 5: DISCUSSION

5.1 The Big Five

The experiment was consistent with previous research in showing a significant and positive correlation with procrastination. However, this study was contrary to previous research in showing a significant and negative correlation with procrastination. Steel (2007) associates neuroticism with one's susceptibility to anxiety and stress. He recites that researchers have argued that if someone procrastinates because tasks are aversive, then people prone to stress should procrastinate more if they procrastinate because the tasks are stressful. Perhaps persons in the sample population higher in neuroticism were more likely to be avoidance oriented, where the avoidance of poor performance was more of a motivator than actually avoiding the work.

It is interesting to note that Conscientiousness was significantly, negatively correlated with Extraversion and Agreeableness. Fumham & Fudge (2008) reported slight, positive correlations Conscientiousness with Extraversion and Agreeableness. The differences between the reported correlations might be able to be attributed to the differences in the sample populations. The students at Georgia Tech and sales consultants may vary in their trait characteristics.

5.2 Exploratory Variables

The hypothesis was maintained that the number of late incidents positively correlated with procrastination scores. While Steel (2007) reviewed that age is negatively correlated with procrastination, it was not originally hypothesized that age would have a significant correlation in the sample population. The age range among the population was about 18.33 to 23.84, a range a little over 4 years. Age and procrastination were not hypothesized to be highly correlated due to the small range of the age group included in the sample population. Perhaps the differences

were magnified due to the college environment. Students in college may learn strategies to avoid procrastinating studying for tests and working on projects. The work students do in college is much greater than the work they do in high school, and older students may simply know better procrastination avoidance strategies.

5.3 Achievement Goal Framework

The results for the Achievement Goal Framework were generally consistent with the initial hypotheses. While none of the correlations were significant, both the avoidance orientations were positively correlated with procrastination and both of the approach orientations were negatively correlated with procrastination (although Performance-Approach had a correlation of only -0.001). This is also consistent with the theoretical framework as persons more avoidance oriented are more motivated by avoiding failure. Theoretically, high procrastinators will be much more likely to avoid aversive tasks (Steel, 2007), thus they should be more likely to be motivated to avoid aversive consequences as well.

When the four orientations were collapsed and assessed individually, only the avoidance orientation had a significant correlation with procrastination, however both the performance and mastery orientations were positively correlated with procrastination. Also, the repeated measures tests showed that persons lower in procrastination were more likely to have an approach orientation and persons higher in procrastination were more likely to have an avoidance orientation. This is consistent with the initial correlation findings. There was not, however, any significant main effect of the performance/mastery axis. This suggests that both low and high procrastinators maintained similar levels on the performance and mastery orientations. Figure 2 shows that, despite these findings, there was still a much larger discrepancy between the mastery and performance values among low procrastinators than there

was among medium procrastinators and high procrastinators. Low procrastinators had higher average values for the mastery dimension than the performance dimension. These findings, while not significant, suggest that perhaps low procrastinators are more mastery-approach oriented while high procrastinators are more performance-avoidance oriented.

5.4 Goal Commitment

The results showed that goal commitment was lower among high procrastinators than it was among lower procrastinators. However, goal commitment, contrary to the initial predictions, was not higher for the specific goal than it was for the non-specific goal. According to goal-setting theories, the goal of achieving a 3.25 GPA was likely perceived as too challenging to obtain by participants with lower GPAs. This is slightly reflected in the small positive correlation between GPA and Goal Commitment. Grade-point-average was more strongly correlated with the non-specific goal commitment ($r = 0.213$, $p < 0.05$) than it was with the specific goal commitment ($r = 0.173$, $p < 0.05$). Theoretically, goal commitment should have been higher with the specific goal than with the non-specific goal, however the sample size, and design of the study likely diluted the probability a statistically significant relationship would be discovered.

5.5 Academic Problem Solving

5.5.1 Major Test vs. Non-Major Test

The academic problem solving situations shed light upon the differences between study behavior in low and high procrastinators. The Major vs. Non-Major test situation showed that the amount of time allocated to studying for the major and non-major tests individually remained constant. However, this was due to the design of the project in which the number of hours for study had to add up to 9 hours total. If students were allowed a maximum number of hours and

told to write down the number of hours they would likely study for each test, then there may have been different results. When analyzed over the course of the week, collapsing across test type, participants of all three procrastinator types tend to study in the same manner. They studied less at the beginning of the week and had a spike of productivity on Saturday and Sunday. However, low procrastinators tended to do slightly more work than higher procrastinators earlier in the week, although this data was not significant. The flaw in this methodology, however, is in the hypothetical nature of the situation. The situation measures how participants believe they would study rather than how they actually study. Thus, this problem is vulnerable to psychological biases such as the overconfidence bias. Hypothetically, the discrepancy between low and high procrastinators' study habits would vary more given a larger sample size and an objective measurement of study habits.

5.5.2 Social Situation

The significance of the social situation problem is establishing the validity of the procrastination measurement. Theoretically, it is already known that students prone to high procrastination tendencies would be more likely to display these procrastination tendencies when choosing between going to a social event and completing the work that needs to get done. Low procrastinators were much more likely to skip the event or leave early to start work on the hypothetical paper. However, it must be mentioned that the relationships between Conscientiousness and Extraversion, and Conscientiousness and Agreeableness could explain the reason for the results of the frequencies of the social situation answers. Conscientiousness was negatively correlated with both Extraversion and Agreeableness, and because of this correlation, students higher in Conscientiousness may have also been less likely to attend social events and may be less motivated by social situations. Thus, this may contribute to the fact that these

participants would be more willing to skip a hypothetical social event to do work and avoid procrastinating.

5.5.3 Four-Week Situation

The significant revelation for this situation was the pattern of studying across the weeks. There was as significant quadratic relationship, revealing that students, among all procrastinator types, tend to do less work at the beginning, and the most work in the middle. In this case, the most work was done during the third week with a reduced amount of productivity during the fourth week. There would not be any effect of procrastinator type due to the design of the study. Similar to the test type situation, this situation is hypothetical, and it might be more significant and revealing if participants were allowed to allocate the hours they would work on the project. If participants were told that the project usually takes between 20 and 40 hours (instead of a flat 30 hours) it would be interesting to observe whether or not high procrastinators allocated a lower number of hours to the project than low procrastinators.

5.6 Regression Analysis

This analysis was done to analyze whether or not the predictor variables included in the experiment were accurate in predicting the procrastination tendencies of the relatively small and heterogeneous sample population. About 48.5% of the variance was accounted for by six of the predictor variables. The amount of variance accounted for would likely be higher with a larger sample size. While this is not a large account of the variance, it was statistically significant and indicative of a relationship between the predictor variables and procrastination. Perhaps further investigation into the exact relationship would reveal a stronger relationship.

5.7 Limitations

This study is an exploratory study aimed at uncovering the previously unknown relationship between procrastination and goal setting. As such, this study reveals no causal relationships, merely presence or absence, and strength of the relationships between the variables involved in the experiment. This study will be most useful for simply showing the relationship. It will be up to future studies to investigate the details of the relationship between procrastination and goal setting behaviors.

Another weakness of this study lies in the methodology. Among motivated students, performance would likely be higher if the students created their own goals to complete. This study assigns a mandatory goal to all students, thus students might be less motivated to pursue and successfully fulfill a goal assigned by a third party. Among less motivated students, this should not matter, as they would likely be too unmotivated to create their own goals in the first place. However, this study lacks significant amount of power to generalize the results to self-imposed goals as an outside party imposes the assigned goal on the students. Difficulties would arise if students were allowed to create their own goals as some goals would be more or less quantifiable and would involve varying time frames. Thus, it is necessary for this study to impose the same goal on all participants.

5.8 Future Research

This study was very broad, not deep, in nature. The purpose was to explore the relationship between procrastination and predictor variables, including an initial relationship with goal-setting behaviors. Thus, studies investigating these relationships in depth would likely reveal more about the details of these relationships. Studies in the future might assess individual differences in procrastination then analyze goal-setting behaviors in depth. Specifically, they

might require students to set goals and analyze how students varying on trait procrastination differ in their particular goal-setting behaviors. Likewise, goal-setting interventions that have been successful in the professional setting might be modified for the university setting and analyzed to assess whether these interventions are as effective among college students as they are in an organizational context.

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