

FINALLY, MY THESIS ON ACADEMIC  
PROCRASTINATION

by

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## ACKNOWLEDGEMENTS

To my wife – who has always been there to support me on this journey.

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## ABSTRACT

### FINALLY, MY THESIS ON ACADEMIC PROCRASTINATION

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References to procrastination have been dated back to as long as 3,000 years ago. However, research on procrastination is ironically enormously behind the curve in active research on its antecedents and effects. Academic procrastination is a unique outlet of procrastinatory tendencies and is the object of much less scientific research. Academic procrastination occurs when students needlessly delay completing projects, activities or assignments and has been linked to lower academic grades, poorer well-being, and more stress. Studies have found procrastination to be a vital predictor of success in college and the development of a scale upon which to measure it could be quite profitable to colleges and universities. Numerous scales such as the Lay (1986) General Procrastination Scale, the Solomon and Rothblum (1984) Procrastination Assessment Scale for Students, and the Choi and Moran (2009) scale have been used to measure procrastination. However, the Tuckman (1991) Procrastination Scale is the most widely used scale to identify academic procrastinators.

The current study examined these scales as compared to a new scale, the Academic Procrastination Scale (APS). The main goal of the current study was the development of a superior academic procrastination scale. The 25-item APS was originally developed in a pilot

study using 86 undergraduate college students and was based on six different characteristics of procrastinators: Psychological belief about abilities, distractions of attention, social factors, time management skills, personal initiative, and laziness. The current study examined the relationship between the APS and the personality trait of conscientiousness and the predictive ability of the APS in regards to academic success as compared to the other procrastination scales.

In the current study, a total of 681 participants responded to a survey. Participants were, on average, 21 years of age and came from diverse academic majors and demographic backgrounds. The APS exhibited greater reliability and internal consistency,  $\alpha = .94$ , as compared to the four other scales. The APS also exhibited ample convergent validity and was significantly correlated with the other scales. The APS was also significantly related to Grade Point Average (GPA); as individuals procrastinated more, they possessed a significantly lower GPA. Yet, the APS proved far superior at predicting grades in school as compared to the four most widely used procrastination scales. The APS even added incremental validity beyond these four scales in predicting semester grades. The APS also predicted variance in grades beyond a well-known personality predictor, conscientiousness. Moreover, scores on the APS fully mediated this established relationship between conscientiousness and grades.

A factor analysis of the APS revealed one underlying factor, seemingly indicating that the scale was measuring academic procrastination. Test bias could possibly destroy a scale's validity and was therefore assessed using two different procedures. An Analysis of Variance revealed that scores on the APS did not systematically vary with such irrelevant variables as gender, ethnicity, academic major or academic year. The Lautenschlager and Mendoza (1986) approach found that scores did, however, vary across ethnicity with Caucasians exhibiting a higher GPA across all levels of the APS when compared to African Americans. This trend was also found for the Tuckman scale, however. However, this bias could potentially be explained by GPA varying across ethnicity with Caucasians exhibiting a significantly higher cumulative

GPA as compared to Hispanics or African Americans. Although the internal consistency of the APS was quite high, it is also symptomatic of redundant items. Thus, the possibility of reducing the scale to five items was assessed and validated. This shortened scale also exhibited adequate reliability,  $\alpha = .87$ , and was able to account for variance in GPA beyond the other widely used scales on procrastination.

Scholastic Aptitude Test (SAT) scores are used across the country to select students on the basis of success in college. However, both the APS and SAT uniquely predict college grades and together, account for 16% of the variance in college grades. It is even proposed that the current scale be used in conjunction with SAT scores to predict success in college. The APS could add significant validity to such a collegiate selection procedure. If procrastination is consistently found to have negative consequences, then students who exhibit higher scores on the APS could also be remediated in educational settings. Thus, based on results from the current study, the APS could be used as a valid, reliable, and instrumental tool within the educational community.

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Procrastination

It happens time and again: A student sits down to do a time-intensive project only to get distracted by friends. A teacher plans to grade papers but instead watches television. A business person is late to an appointment because he or she puts off leaving until later. All of these are examples of procrastination. Procrastination is a phenomenon that can affect all areas of a person's life. A unique form of procrastination, academic procrastination, is a less-studied and unique outlet of procrastination that deserves much more attention than what it has received. A valid and reliable scale is needed on which to base psychological conclusions and advance knowledge of this unique construct.

Procrastination comes from the Latin "pro," which means forward, and "crastinus," which means of tomorrow (Mish, 1994). It is a tendency to put off, avoid or delay activities. It has also been characterized as "delaying task completion to the point of experiencing subjective discomfort" (Ferrari, 1992, p. 315), an "intentional delay of an intended course of action" (Klassen, Krawchuk & Rajani, 2008, p. 916) or as a stable personality trait with negative consequences (Choi & Moran, 2009). There seems to be agreement on procrastination as consistently delaying behaviors regardless of consequences (Van Eerde, 2003). In most cultures, especially the American culture in which people strive for performance and results, procrastination can be detrimental for individuals. In fact, studies have reported that 20% of adults experience chronic procrastination (Klassen et al., 2008).

Research has even supported the notion of procrastination being relatively stable across an individual's lifetime. In a meta-analysis on aspects of procrastination, Steel (2007) mentioned that high test-retest reliabilities in previous studies over a span of 42 days and as

long as 10 years are indicative of the stability of procrastination across an individual's lifetime. Consequently, levels of procrastination tend to show consistency across time.

#### 1.1.1 The Prevalence of Procrastination

Some researchers have labeled procrastination as a discrepancy between intent and behavior (Lay, 1994). What an individual intends to do is entirely different from what an individual actually does. The greater this discrepancy between intent and behavior, the greater the procrastination (Schraw, Wadkins & Olafson, 2007). Nevertheless, procrastination seems to be a human phenomenon that has intrigued researchers ever since psychologist William James recognized its psychological underpinnings nearly 120 years ago (Klassen, Krawchuk & Rajani, 2008). Researchers have even labeled procrastination as "one of the least understood minor human miseries" (Ferrari, 1994, p. 673).

Procrastination has been widely noted since before the dawn of industrial civilization. John Lyly, an English novelist, mentioned as early as 1579 that there is "nothing so perilous as procrastination" (Steel, 2007, p. 66). Hesiod, a Greek poet, mentioned the perils of putting off work until tomorrow as early as 800 B.C. Famous people in history such as Thucydides, an Athenian general, and Cicero, a consul of Rome, have also been cited as speaking extensively against procrastination. Such widespread assent towards the existence of procrastination supports its persistence in human behavior (Steel, 2007).

Procrastination affects almost every single individual at some point in his or her life. Some researchers have even stated that nearly one-quarter of the adult population is affected by procrastination (Ferrari, 1994). Delaying departure only to be late to work or an appointment, talking to friends instead of working on schoolwork and putting off diet or exercise are all examples of how procrastination can affect a person's everyday life. All of these examples have financial, psychological and/or biological implications. In fact, Klassen, Krawchuk and Rajani (2008) established that procrastination, in most cases, has an inverse relationship with variables

such as self-esteem, self-efficacy and motivation. Overall, it would seem that procrastination results in negative consequences and is very rarely noted as a positive behavioral tendency.

Procrastination is present in the work setting as well, where employees tend to delay projects and activities until the last minute. According to two leading human resource management consultants, procrastination is even considered the number one killer of leading businesses (Caruth & Caruth, 2003). "Putting off until tomorrow, next week, next month, or next year has killed more ideas, innovations, improvements, and human initiative than all other faults combined" (Caruth & Caruth, 2003, p.1). Those who procrastinate can needlessly delay the implementation of new services or products to consumers and place companies in bad financial or competitive positions.

It is shocking at how much sparse scientific research has been conducted regarding procrastination (Steel, 2007). It would seem that "procrastination is a relatively un-explored psychological construct" (Klassen, Krawchuk & Rajani, 2008, p. 916). Sparse research is astonishing considering the fact that procrastination affects nearly 1 in 4 adults and has experienced a general increase in the population (Ferrari, 1994). Combine rising rates of procrastination with increasingly self-structured and unstructured jobs in the U.S. and it would seem that procrastination has the ability to become an unbridled distracter to work (Steel, 2007). If workers procrastinate more and are also not directed on the job, problems may arise. If companies were able to develop a reliable scale that identifies procrastinators, massive amounts of money could be saved through hiring, retention or training programs targeting procrastination.

### 1.2 Academic Procrastination

Perhaps the easiest studied and most prevalent of all outlets of procrastination is academic procrastination. Academic procrastination is the tendency to put off or delay school-related activities and behaviors. Academic procrastination occurs with students of all ages, whether those students are attending grade school or pursuing some type of educational

attainment or degree. Research has suggested, however, that procrastination is extremely common among college students (Schraw et al., 2007). Moreover, due to the wide availability of students in a college setting, research on academic procrastination can be more easily studied.

It should be noted that academic procrastination is a unique outlet for procrastination. People procrastinate on a wide variety of activities and in a wide variety of circumstances, whether it is putting off completing a project, grading papers, or leaving for a meeting. Nevertheless, unique outlets of procrastination, such as in academics, can exist where individuals tend to delay activities in certain areas. Unique outlets of procrastination have been of interest to researchers concerned in narrowing the behavioral and dependent outcomes of procrastination (Tuckman, 1991). Specific outlets of procrastination can be more easily studied, as well.

Moreover, although it does appear that individuals have a tendency towards procrastinating or not, which in turn affects the likelihood of demonstrating procrastinatory behaviors in these specific outlets, other factors can come into play which weaken this relationship. For example, individuals who do not typically procrastinate in their everyday lives may procrastinate in their academic endeavors because of a lack of understanding of the complexities of meeting numerous deadlines, inadequate beliefs regarding studying habits or because of a false belief that their high abilities allow them to do so.

Procrastination among undergraduate students in college is more common and some studies have even found that over 70% of university students admit that they procrastinate regularly (Schraw et al., 2007). Academic procrastination occurs when students needlessly delay completing activities, projects or assignments. Such procrastination can place undue stress or anxiety upon individuals as they hasten to meet deadlines and complete assignments. Putting things off can not only affect one's psychological well-being, but can also affect one's relationship with others. As individuals fail to meet deadlines and commitments, relationships become strained. However, research is somewhat mixed on the effects of procrastination. For

example, Schraw et al. (2007) argue that procrastination might have a useful adaptive advantage that allows students to garner better use of available study time. However, other studies have established that procrastination corresponds to less success in life (Ferrari, 1992). The concentration of this research, like most others, is on the negative form of procrastination.

Colleges have become overly reliant on predictors of academic success such as scores on the Scholastic Aptitude Test (SAT) to the point where scores on the SAT are used in extremely important selection decisions (Wesley, 1994). However, studies have shown that “procrastination is capable of accounting for variance in college grades beyond what is explainable by the SAT” (Wesley, 1994, p. 407). Therefore, procrastination can possibly be distinguished as a particularly vital predictor of success in college. As a result, a valid and reliable scale of academic procrastination could be quite profitable and of great importance to colleges and universities.

Such a scale can prove valuable in remediating students. Those students who exhibit higher levels of academic procrastinatory tendencies could be given lessons in studying effectively and keeping deadlines and goals. If identified early enough, students can be given the right tools for overcoming procrastination and succeeding in college.

#### *1.2.1 Conceptualizing Academic Procrastination*

Regardless of the effects of procrastination, there appears to be numerous conceptualizations and components of academic procrastination. For example, Choi and Moran (2009) discussed what they referred to as active procrastination, which was comprised of four distinct characteristics. Specifically, it was proposed that those who actively procrastinate 1) prefer time pressure and 2) *intentionally* procrastinate. They are also 3) able to meet deadlines, and 4) are satisfied with the outcome. Later studies have discounted these four distinct characteristics of academic procrastination (Chu & Choi, 2005). However, numerous dimensions or facets of academic procrastination have been identified through past literature. Identifying those possible dimensions of academic procrastination, therefore, is one step



towards the creation of a valid and reliable scale. Six unique facets or characteristics of academic procrastination are exemplified in the literature. It is believed that these six characteristics describe those who procrastinate in academics. The six characteristics of academic procrastination are psychological beliefs about abilities, distractions, social factors, time management, personal initiative and laziness. Each will be discussed briefly.

#### 1.2.1.1 Psychological Belief About Abilities

Although other studies have failed to validate the four-factor approach to active academic procrastination, studies have found that procrastinators tend to rationalize their tendencies to put things off and their ability to work under pressure (Wohl, Pychyl & Bennett, 2010). Therefore, one aspect of procrastination involves psychological beliefs about the ability to work under pressure. This has been defined in similar studies as sensation-seeking (Steel, 2010). In other words, academic procrastinators seek, either actively or passively, to work under pressure. Those who procrastinate have an undeniable belief in their ability to work under pressure.

In fact, this belief in ability might have some basis in other psychological research. Students have what Sokolowska (2009) phrased as an academic self-concept. This self-concept is a self-reflective view individuals hold of themselves and students either believe themselves to be effective or ineffective students. The more students believe that they are effective, the more likely they are to procrastinate and “cram” before tests due to their self-confidence in their abilities and positive view of themselves. “Cramming” for tests is when students procrastinate, or wait until the night or hours before an exam or project to begin studying.

Schraw et al. (2007) cite research which found that “crammers” experience a greater sense of challenge and excitement when waiting until the last minute to study. This challenge might promote an emotional allure for some students in which they feel more compelled to study during these sessions. However, research indicates that those who “cram” or procrastinate

perform poorly in school (Steel, 2007). Nevertheless, a facet of procrastination might entail this emotional allure or psychological belief in the ability to work under pressure.

#### 1.2.1.2 Distractions of Attention

Studies on procrastination have determined that those who procrastinate are easily distracted by more interesting or fun activities. Thus, individuals who procrastinate take part in self-handicapping (Steel, 2007). That is, they intentionally place more pleasing activities ahead of appointments or deadlines. Procrastinating individuals tend to sleep, watch television or play instead of working on more important things in order to distract or distance themselves from responsibilities.

One reason students tend to distract themselves with other things instead of deadlines and schoolwork stems from the fact that, typically, tasks such as projects and assignments are aversive to students. “Consistently and strongly, the more people dislike a task... the more they procrastinate” and tend to choose more interesting activities instead of working on schoolwork (Steel, 2007, p. 75). This task aversiveness to important responsibilities is a hallmark of procrastinators. Those who procrastinate consistently turn to other activities and behaviors rather than concentrating on an intended course of action (Klassen, Krawchuk & Rajani, 2008).

Distracting oneself from responsibilities also gives “an out” if one fails at that task (Steel, 2007). For example, if a student has an extremely difficult test or project due and is afraid of failing, he or she can protect self-worth or self-esteem by giving an outside excuse or external distracter for failing. Thus, the student instead distracts him or her self with another activity, blaming failure on said activity. Therefore, a unique characteristic of procrastinators is that they tend to immerse themselves in distractions.

#### 1.2.1.3 Social Factors of Procrastination

Research on procrastination has established that procrastinators tend to fail in self-regulation of behaviors in times of high stress (Klassen, Krawchuk & Rajani, 2008). Self-regulation involves the ability to adapt or regulate one’s performance under varying

circumstances. Thus, procrastinators tend to disregard deadlines or projects when placed in stressful situations. Social factors, such as friends or family could keep one from keeping timelines or deadlines. This task aversion to school work was recognized by Brownlow and Reasinger (2000) as one of the major reasons procrastinators put off school work.

Social factors can promote task aversiveness or task avoidance, both of which are dimensions of procrastination mentioned by Schraw et al. (2007). Traditional college students are those in their early adulthood and late adolescence, aged 18-23 years of age. Such an age is characterized by social adjustment and independence. Students attempt to juggle and schedule time with family, friends and work. Add a newfound sense of independence and autonomy to this struggle and college students can turn away from school work and deadlines and choose instead to work or socialize with friends. Therefore, social factors are indicative and promotive of procrastination.

#### 1.2.1.4 Time Management Skills

Steel (2010) provided support for a three-factor model of procrastination. Two of these factors could be labeled as time management and fall under the realms of promptness and appointment keeping. Time management can be defined as having an ability to consciously control activities and behaviors so as to maximize one's available time (Mish, 1994). Procrastinators tend to have an inability to manage their time and experience a wide discrepancy between their actual intent and their realized behaviors. Difficulty in managing one's time was discovered in previous studies as a reason why students academically procrastinate (Solomon & Rothblum, 1984).

Time management skills are not an inherent trait, but a learned characteristic within individuals. Time management is "a critical contributor to procrastination in academic settings" (Sokolowska, 2009, p. 18). To succeed in an academic environment, students must show up on time to classes and keep deadlines. They must also complete assignments and tests by predetermined dates. Juggling a large course load, homework, projects and assignments

usually requires an individual to maximize his or her free time. Poor time management could result in forgetting to turn in an assignment, unintentionally putting off studying until the last minute or working on other, less important activities instead of academic work. Thus, failing to manage time effectively could be a defining characteristic of academic procrastinators.

#### 1.2.1.5 Personal Initiative

Some researchers have characterized procrastination as a “dysfunctional delay” (Steel, 2010, p. 929). Such a delay can occur not only because of social or situational variables but also because of attitudinal or personality characteristics such as initiative. Initiative is a general readiness or ability to begin or carry out tasks energetically (Mish, 1994). If a student lacks initiative, he or she will not have a certain drive to complete a task or assignment on time. Lack of motivation or personal initiative was mentioned by Caruth and Caruth (2002) as a reason for procrastination. Generally, students are more effective academically when they are motivated. Motivation is a drive to succeed and can either be internal or external.

Those students who have an internal drive to complete academic work also procrastinate less. Conti (2000) found that students with intrinsic reasons for completing academic work procrastinate less while those who are externally motivated to complete academic work experience high procrastinatory tendencies. Carden, Bryant and Moss (2004) support this supposition and found that students who are internally-oriented procrastinate less academically when compared to those who are externally-oriented. Personal initiative is most synonymous to internal motivation. Therefore, it is proposed that those students who possess personal initiative and the intrinsic drive for completing their academic work procrastinate to a lesser extent.

Fear of failure, as well, could be a potential reason behind some forms of procrastination (Steel, 2010). Academic procrastinators might be prone to not carrying out tasks for fear of failing at that task. In fact, Solomon and Rothblum (1984) performed a factor analysis on the reasons why students procrastinated and found that fear of failure accounted for

approximately 49.40% of the variance. Thus, fear of failing could quite possibly be one of the reasons why students procrastinate. Students might lack initiative and have an absence of motivation and enthusiasm to complete school work because they fear failing at those tasks. Thus an academic procrastination scale must assess a student's personal initiative.

#### 1.2.1.6 Laziness

Meanwhile, various other studies on academic procrastination have found a variety of up to three factors of academic procrastination. These factors include "fear of failure, task aversiveness, and laziness" (Schraw et al., 2007, p. 13). Laziness is a tendency to avoid work even when physically able (Mish, 1994). Aversiveness and laziness were factors that accounted for 18% of the variance in reasons for students' procrastination according to Solomon and Rothblum (1984). If students are physically avoiding school work, they are merely putting off all of this work until the end of the semester. Thus, they are exhibiting a degree of laziness and task aversiveness.

According to a recent theoretical study on procrastination, up to 40% of students stated that they would drop a college course if the professor expected too much of students or was too inflexible on due dates or deadlines (Schraw et al., 2007). Thus, academic procrastination might involve the tendency to avoid a great deal of school work, or laziness.

#### 1.2.2 *Defining Academic Procrastination*

For the purposes of the current study, it is believed that academic procrastination is an overarching factor comprised of the various interrelated components previously discussed. Moreover, it is believed that although procrastination tends to be relatively stable over time, given proper interventions or contextual factors, these tendencies can be modified. Thus, as previously discussed, training interventions may be beneficial for students identified as high in academic procrastination. Finally, it is believed that academic procrastination is related to overall procrastination, but that it is a unique outlet that can be affected by contextual cues and interventions, thus warranting its own line of research.

### 1.2.2.1 Nomological Network

As evidenced by the multiple proposed characteristics and dimensions of procrastination, procrastination can be related to multiple different facets of behavior, personality and psychological concepts. To garner a better understanding of the construct of academic procrastination, a nomological network was proposed on which the Academic Procrastination Scale (APS) was to be constructed. A nomological network is a means by which to evaluate the interrelatedness of a construct to other constructs and facets by observing their relationships and expected associations (Cronbach & Meehl, 1955). Identifying the nomological network also helps in identifying the construct and developing items for the creation of a scale.

Van Eerde (2003) conducted a meta-analysis on procrastination in an attempt to discover the relationship procrastination has to various personality variables and behavioral characteristics. The results supported the notion that procrastination fits lawfully into a nomological network. Observing a wider array of performance indicators such as academic performance and grade point average (GPA) and personality variables such as neuroticism and conscientiousness, van Eerde (2003) found that the largest (negative) correlation occurred between procrastination and conscientiousness. Such things as self-image and self-confidence exhibited high correlations with procrastination, as well. As a precursor to scale development, the current study incorporated results from van Eerde (2003), as well as novel ideas and behaviors, into a working nomological network in which theory would drive scale development. Figure 1.1 shows the proposed nomological network of academic procrastination. The interrelated constructs and behaviors are, by no stretch of the imagination, an exhaustive list of all possible relationships. Academic procrastination has the potential to be related to various other constructs, measures and outcomes. For example, the relationship between conscientiousness and procrastination and the effect of procrastination on academic performance has been documented in previous research (Steel, 2007).

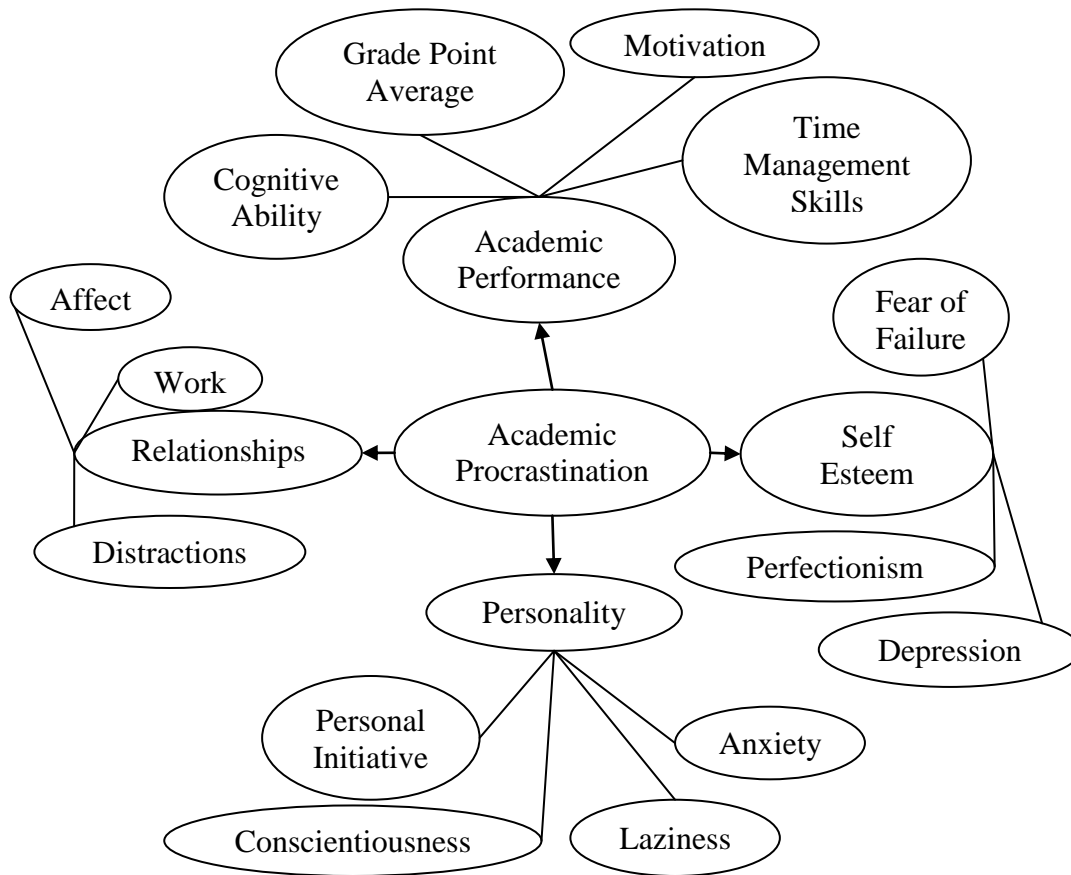


Figure 1.1 Proposed nomological network for academic procrastination.

### 1.2.3 Relationship with Academic Success

#### 1.2.3.1 Conscientiousness

Those who are conscientious are described as being dependable, organized and responsible (Davis & Palladino, 2007). Conscientious people tend to keep to deadlines and are able to delay gratification. Previous studies have supported the proposition that conscientiousness is a stable predictor of academic success in college (Cheng & Ickes, 2009). Those students who are highly conscientious should perform better academically. Academic success, however, can be measured a multitude of different ways. GPA is the most widely used

measurement of academic success and thus will be used as the main academic success variable. Research has stated that those who are high in conscientiousness should perform better academically because they are more organized, responsible and diligent in completing requirements. Thus, it is proposed:

**Hypothesis 1** Conscientiousness will be positively related to academic success.

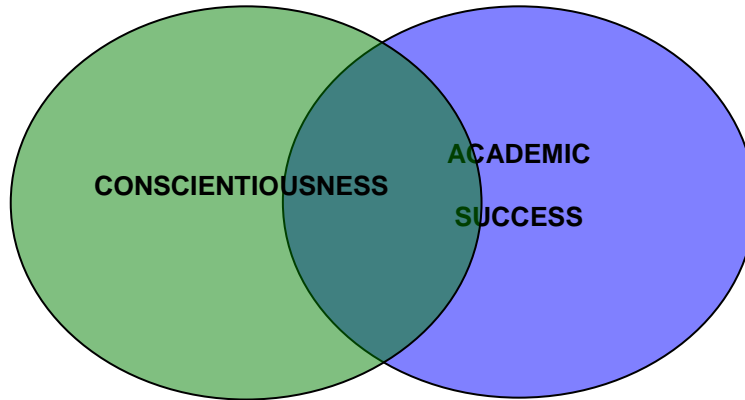


Figure 1.2 Illustration depicting Hypothesis 1.

Those who procrastinate tend to be just the opposite of those who are conscientious, putting off deadlines and being characterized as inefficient. Therefore, it is proposed that conscientiousness is negatively related to procrastination. In other studies of procrastination, procrastination has been found to be negatively related to conscientiousness. Choi and Moran (2009) found that unintentional procrastination was highly negatively related to conscientiousness. However, the intentional decision to procrastinate was not related to conscientiousness. This might be because those who choose to procrastinate frequently restructure tasks and deadlines, organizing their responsibilities and thus, exhibit a higher level of conscientiousness (Choi and Moran, 2009). Nevertheless, other studies have also supported the relationship between procrastination and conscientiousness. Some studies have even proposed that “procrastination is conceptually representative of low conscientiousness” (Steel, 2007, p. 70).



However, studies have suggested that procrastination and conscientiousness are two distinct constructs (Steel, 2007). Previous studies have found as many as six factors that represent conscientiousness (Roberts, Chernyshenko, Stark & Goldberg, 2005). Only one of these factors represented and was indicative of procrastination, labeled as industriousness. “Procrastination may be considered to be the most central facet of conscientiousness, but it is not conscientiousness itself” (Steel, 2007, p. 67). However, a meta-analysis consisting of 20 articles and over four thousand participants on procrastination and conscientiousness reveals a high negative correlation between the two constructs (Steel, 2007). Thus, procrastination and conscientiousness are two distinct, yet interrelated constructs. In turn, the relationship between the two is proposed to be the same for academic procrastination. Specifically, it is proposed that:

**Hypothesis 2** Scores on the newly developed Academic Procrastination Scale will negatively correlate with measures of conscientiousness.

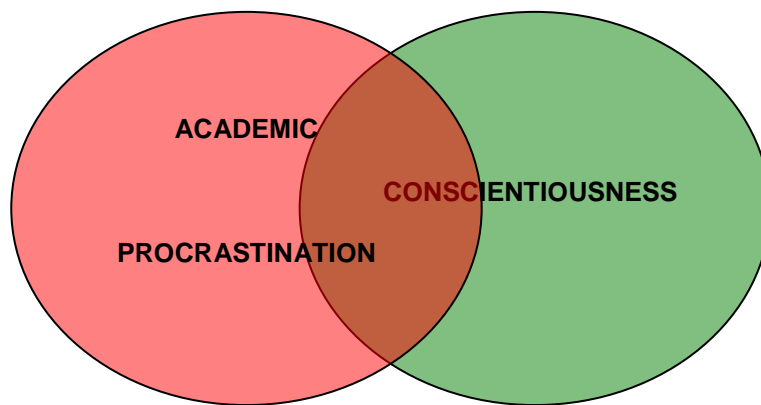


Figure 1.3 Illustration depicting Hypothesis 2.

#### 1.2.3.2 Academic Success

Objective indicators of academic success are routinely used in studies on academic procrastination. One of the earliest studies on a self-report measure of procrastination, the PASS, however, failed to find a significant relationship between college course grade and

academic procrastination (Solomon & Rothblum, 1984). In validation of an active procrastination scale in which people make an intentional decision to procrastinate, Choi and Moran (2009) found that grade point average was unrelated to active procrastination.

Other studies, however, have found there to be a relationship between academic success and procrastinatory tendencies. In a seminal study on the effects of procrastinatory behaviors on academic success, Wesley (1994) suggested that academic success in college was not an invariant property of ability or success in high school. Instead, Wesley proposed that procrastinatory behavior explained unique variance above and beyond ability or success. Results suggested that procrastination accounted for a significant proportion of variance in academic college success above and beyond that explained by academic success in high school or academic ability. Thus, Wesley (1994) essentially projected the significance and importance of procrastination on academic success. In a meta-analysis on the effects of procrastination on GPA, Steel (2007) established a somewhat high negative correlation between procrastination and academic performance. Thus, it is proposed that in the development of the APS, procrastination will be related to academic success.

**Hypothesis 3** Scores on the APS will negatively correlate with academic success.

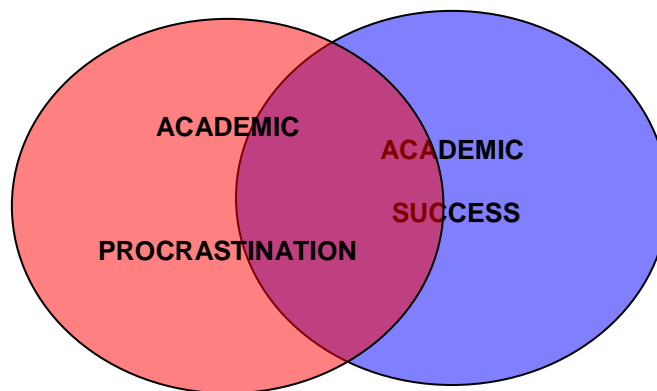


Figure 1.4 Illustration depicting Hypothesis 3.

In addition, it is proposed that conscientiousness does not, in and of itself, explain and predict academic success in college. According to past research on procrastination, “procrastination largely, although not entirely, accounts for the relationship of conscientiousness to performance” (Steel, 2007, p. 81). Thus, it is proposed that:

**Hypothesis 4** The relationship between conscientiousness and academic success will be mediated by academic procrastination.

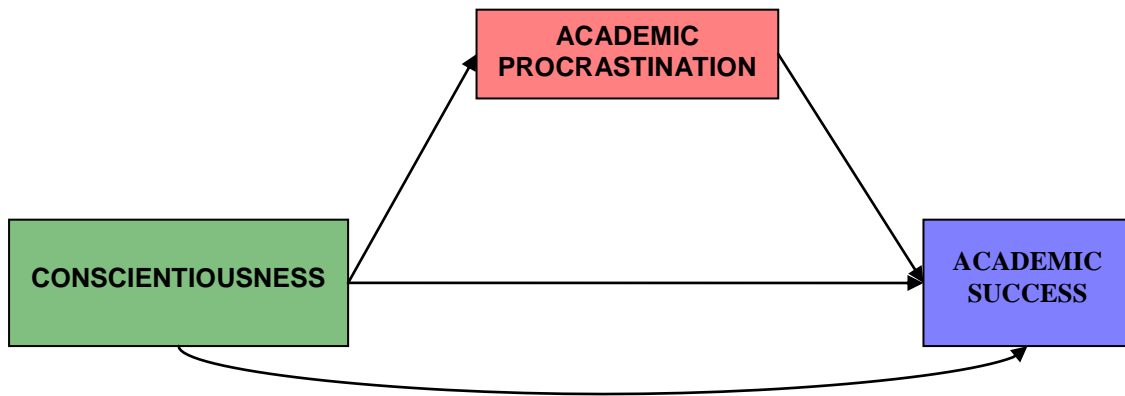


Figure 1.5 Illustration depicting Hypothesis 4.

However, it is believed that the new scale on procrastination can predict academic success above and beyond that predicted by conscientiousness.

**Hypothesis 5** The new measure of academic procrastination will exhibit incremental validity beyond conscientiousness in predicting academic success.

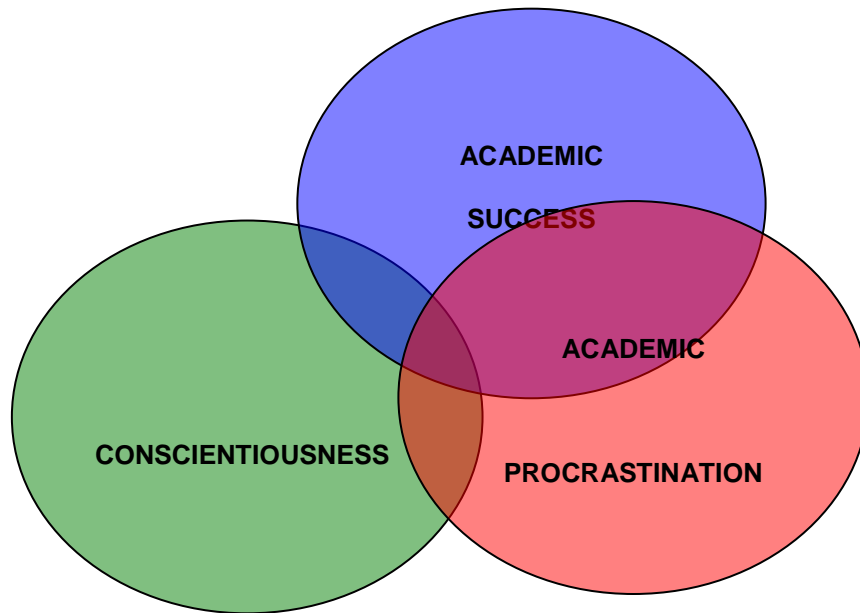


Figure 1.6 Illustration depicting Hypothesis 5.

#### 1.2.4 Current Scales on Academic Procrastination

To date, very little research has attempted the construction of a valid academic procrastination scale. One of the very first attempts at developing a general scale related to procrastination resulted in the General Procrastination Scale (GPS; Lay, 1986). The GPS was a 20-item scale consisting of a reliability of .82 according to Cronbach's alpha coefficient. However, Lay used a median split to describe those either high or low in procrastination and also relied heavily on a study design consisting of participants mailing back inventories to the researcher. Nevertheless, using this scale, Lay (1986) found that procrastination was not correlated with grade point average for undergraduate college students. The GPS scale has received criticism on grounds that Lay (1986) defined procrastination as solely a lack of goal achievement.

The Procrastination Assessment Scale-Students (PASS) developed by Solomon and Rothblum (1984) is a widely used scale to assess academic procrastination. Up until that point, academic procrastination had been mostly measured by looking at behavioral tendencies such

as amount of time spent studying. The PASS was the first recorded attempt at a self-report measure of procrastination. Although Solomon and Rothblum (1984) found that procrastination did not correlate significantly with academic performance, it was found that self-reported procrastination did significantly correlate with an objective behavioral indicator of procrastination.

A major limitation of the PASS is that it consists of measuring procrastination tendencies in only six areas of academic performance: writing term papers, studying, weekly readings, administrative tasks, attending meetings and general academic tasks. Students are asked to indicate both their 1) level of procrastination and 2) degree to which procrastination is a problem on each task individually (Solomon & Rothblum, 1984).

Other studies, however, have indicated that procrastination does not necessarily correspond to problems (Schraw et al., 2007). Thus, by summing up the scores on both questions, the authors are not adequately assessing procrastination but procrastination and negative consequences of procrastination, which is seen as an entirely separate construct. Nevertheless, Solomon and Rothblum (1984) was a seminal article relating to the development of a self-report measure of academic procrastination and is even still in use today.

Chu and Choi (2005) proposed two different constructs related to procrastination. Active procrastinators were those who chose to put things off until the last minute while passive procrastinators were those who had an inability to keep prior scheduling. However, the active procrastination scale consisted of an alpha reliability of .67. The study also failed to provide theoretical proof on the development of the two types of procrastination nor did they provide support for the dimensions of procrastination.

Choi and Moran (2009) attempted to reconcile the shortcomings of the active procrastination scale. In a seminal article, an exploratory and confirmatory factor analysis indicated a multidimensional construct. Theoretically, the first dimension represented outcome satisfaction and those who are satisfied with the products of their procrastination. The second

dimension represented those who prefer the time pressures associated with procrastination. The third dimension consisted of identifying those who made an intentional decision to procrastinate while the fourth dimension identified the ability to meet deadlines.

The Choi and Moran (2009) scale consisted of 16 items with an overall reliability (Cronbach's alpha) of .80. The reliability of the four dimensions of procrastination ranged from .70 to .83. However, convergent validity diagnostics revealed that active procrastination was a unique construct and did not relate to traditional procrastination. Thus, the scale was excellent at identifying the multidimensionality of procrastination. However, the scale developed by Choi and Moran (2009) consisted of general lifestyle questions rather than identifying specific outlets of procrastination, such as academically. It is proposed that procrastination can manifest its intent in specific arenas, such as actively procrastinating on schoolwork or projects. Table 1.1 displays each of the three procrastination scales mentioned previously as well as their proposed limitations.

Table 1.1 Current Scales on Academic Procrastination and Their Respective Limitations

Scale	Description	Validation Sample Size	Total Items	Limitations
Tuckman (1991)	Procrastination Scale	50	16	1) Bad scale development 2) Validated only using juniors and seniors 3) Behavioral anchors make scale non-parametric
Solomon & Rothblum (1984)	Procrastination Assessment Scale for Students	342	12	1) Validated over 28 years ago 2) Behavioral tendencies in specific academic areas 3) Academic areas are dated
Lay (1986)	General Procrastination Scale	76	20	1) Validation using median split 2) Participants from general population 3) Procrastination defined solely as a lack of goal achievement
Choi & Moran (2009)	Active Procrastination Scale	185	16	1) Intentional procrastination 2) Not specific to academics 3) Four characteristic solution of active procrastination not validated

Nevertheless, the preceding scales helped pave the way for future research on procrastination. Through scaling procedures, the definition of procrastination has grown from consisting of solely a behavioral dimension such as a tendency to delay activities (Solomon & Rothblum, 1984), to a multidimensional-perspective considering psychological characteristics such as laziness and fear of failure (Schraw et al., 2007). However, studies on academic procrastination have failed to fully indicate and explore the multidimensional nature of procrastination.

#### 1.2.4.1 Tuckman Procrastination Scale

Tuckman (1991) developed the Procrastination Scale (PS) that purports to measure task avoidance to academic activities. One of Tuckman's major goals was to develop an easily adaptable self-report instrument which identifies academic procrastinators. Tuckman (1991) performed a factor analysis and identified a reliable (Cronbach's alpha = .86) 16-item scale from an original item pool of 72 items. However, Tuckman's first factor analysis consisted of a sample size of 50 participants, which is cause for considerable concern according to Tabachnick and Fidell (2007). Typically, factor analysis requires a large sample size of more than 300 participants to make valid conclusions.

This extremely small sample size is the first issue of contention with using the PS. When Tuckman (1991) compressed his scale from 72 items to 35 items, he drastically reduced the size of his item pool based on a mere 50 responses. Using factor analysis with such a small sample size could have resulted in spurious conclusions. The second issue of contention resulted in the use of a 4-point Likert scale. Such a scale can artificially restrict the range of responses and promote a higher internal consistency coefficient with a lower variability of procrastination. By using defining middle anchors within the scale, one can also argue that Tuckman (1991) was measuring procrastination on a non-parametric ordinal scale.

Furthermore, Tuckman (1991) validated his scale using a sample size consisting of only undergraduate juniors and seniors who were strictly education majors. Such a population



restricts the range of procrastinatory tendencies and limits generalizability. It is proposed that through such disconcerting scale development, the PS cannot be reliably used on a diverse sample of undergraduate students since the original scale was developed using only one subgroup of undergraduates. In fact, studies have even imprudently used the PS on high school populations (Klassen & Kuzucu, 2009), on undergraduates with learning disabilities (Klassen, Krawchuk, Lynch & Rajani, 2008), and even in business settings (D'Abate & Eddy, 2007). Table 1.1 summarizes the proposed limitations of the Tuckman (1991) scale and previous procrastination scales.

Nevertheless, the Tuckman (1991) Procrastination Scale is used as the foremost academic procrastination scale in procrastination research. In fact, it has even been cited in over forty diverse articles on different facets of procrastination. In a recently published article in July, 2010 in the *International Review of Applied Psychology*, the PS was even implemented to examine levels of procrastination in students in Canada and Singapore (Klassen et al., 2010). Convergent validity was established by means of high correlations with objective measures of academic procrastination and correlations with other measures of academic procrastination and task delay (Steel, 2010). However, questions regarding the development of the scale lead to questions on its validity.

It is believed that academic procrastination is multidimensional in nature. Thus, the goal of the current research was to develop a self-report scale on which academic procrastination can be validly and reliably measured and the entire structure of academic procrastination is considered. It is proposed that a far superior academic procrastination scale can be developed.

**Hypothesis 6** The APS will positively correlate with the Tuckman (1991) scale.

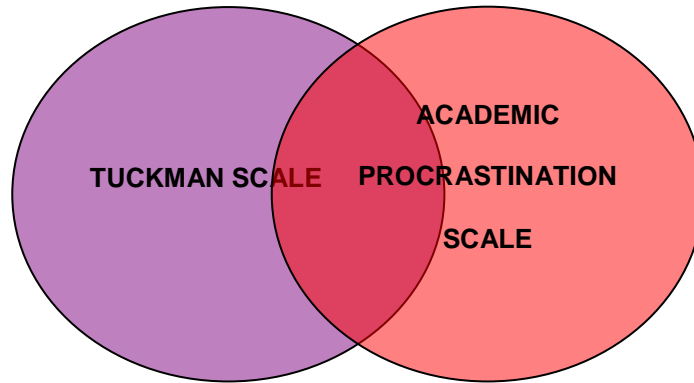


Figure 1.7 Illustration depicting Hypothesis 6.

**Hypothesis 7** The new measure of academic procrastination will exhibit incremental validity beyond the widely used Tuckman (1991) scale in predicting academic success.

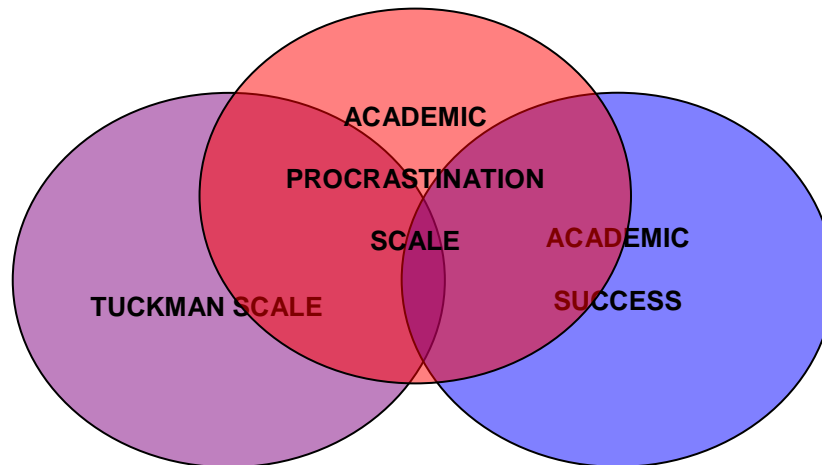


Figure 1.8 Illustration depicting Hypothesis 7.

#### 1.2.4.2 Current Scales and Academic Success

Although procrastination has not always been a strong constant predictor of academic success, former studies have found a weak negative relationship between academic success and procrastination (Steel, 2007). In scale development, however, scales such as the Lay (1986) GPS and Solomon and Rothblum (1984) PASS did not uncover a significant relationship

between procrastination and academic success as measured by grade point average (GPA) and course grade, respectively. The Choi and Moran (2009) scale also did not reveal a significant relationship between GPA and active procrastination.

Although Tuckman (1991) did not relate academic procrastination to academic success, previous studies have found a significant negative relationship between the Tuckman (1991) scale and GPA (Klassen, Krwchuk & Rajani, 2008). During the pilot study on the Academic Procrastination Scale, the current author found that GPA predicted scores on academic procrastination, suggesting a negative relationship between the two. Results suggest that scales measuring general procrastination are not valid predictors of academic success. However, scales more specific to academic life are, indeed, valid. Thus, low average correlations between academic success,  $r = -.19$ , could be misleading when including more general scales on procrastination (Steel, 2007). It is believed that scales more specific to academic life, and more specifically to academic procrastination, will be far superior at predicting academic success.

**Hypothesis 8** The APS will exhibit incremental validity beyond the preexisting scales on procrastination in relating to academic success.

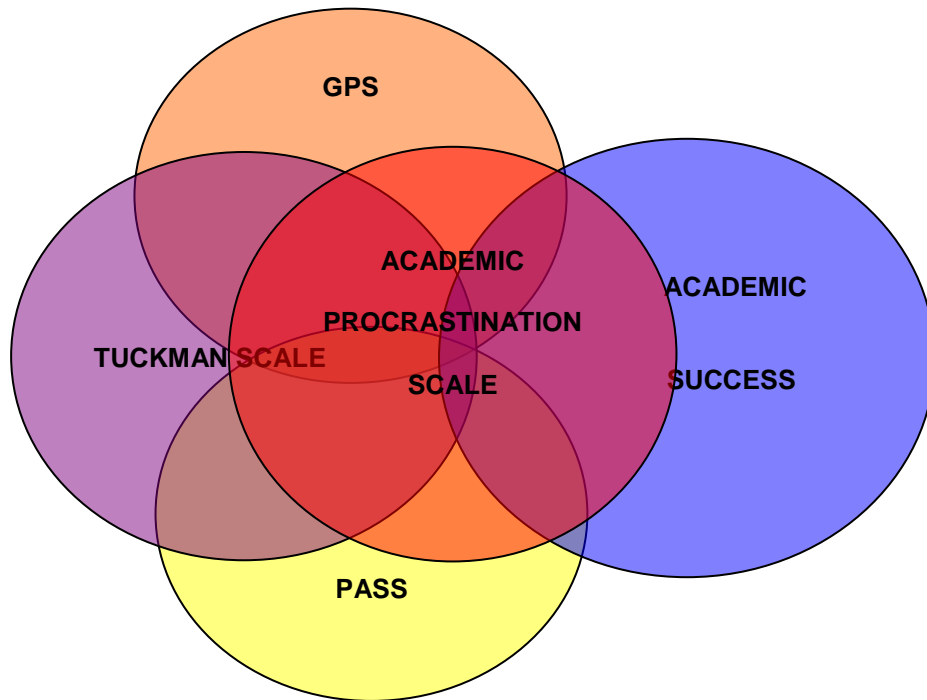


Figure 1.9 Illustration depicting Hypothesis 8.

### 1.2.5 Pilot Study

A pilot study was conducted on academic procrastination. The pilot study was used to develop items assessing academic procrastination. The sample consisted of a total of 86 undergraduate college students. The sample was both diverse in regards to ethnicity and academic major and status. Previous studies have only included juniors and seniors in the development and validation of a scale on academic procrastination (Tuckman, 1991).

The original item pool consisted of 62 diverse items developed and grouped theoretically on the basis of the six dimensions of procrastination mentioned previously (Laziness, Distractions, Beliefs about Abilities, Time Management, Social Factors and Person Initiative). Factor analysis is the most widely used analytic technique in scale construction (Allen & Yen, 2002). However, researchers contend that a large sample size is needed for such an analysis, sometimes reaching upwards of 300 participants to make valid conclusions

(Tabachnick & Fidell, 2007). Due to the small sample size, exploratory analyses could not be conducted. However, high internal consistency was indicative of a homogenous construct. Exploratory analyses will need to be conducted in the next step of scale development in order to assess the factor structure with an adequate sample size. Item analysis, therefore, was used in the pilot study to select the best items. According to Nunnally and Bernstein (1994), “the primary criterion for including an item is the discrimination index, e.g., the corrected item-total [correlation]  $r$ ” (p. 305).

Nunnally and Bernstein (1994), however, do not recommend using correlations as the sole predictor of item selection. Instead, one should also look at the distributions of items. Even though high correlations relate to good discrimination, if all distributions were the same, the scale would likely only discriminate those scoring in the middle of the test, resulting in either low or high scorers. Therefore, item difficulties, or averages in this case, were used in selecting items. If items were only retained which had a mean of 4 on a 5-point Likert-type scale, the scale would be artificially restricting the range of the sample. When examining the distributions of items with a discrimination index above .5, it was determined that these items exhibited adequate distribution coverage. In fact, the average item responses ranged from 1.80 - 3.58, indicating a good range of item responses. Nevertheless, a majority of items were included which were in the middle of the scale and reflected a more normal distribution. All items with item-total correlations of .5 and above were retained in the final scale. The final items were reviewed for domain coverage.

A total of 25 items were retained in the pilot study. The overall internal reliability of the scale was .95 according to Cronbach’s alpha. The Academic Procrastination Scale and the Tuckman (1991) scale, as anticipated, were highly correlated ( $r = .85$ ), indicating that over 70% of the variance in the two scales is shared. However, the current scale demonstrated superior predictive validity relative to the former. Specifically, an ANOVA indicated that students with different grade point average levels possessed differing levels of academic procrastination as

indicated by the Academic Procrastination Scale,  $F(3, 73) = 4.58, p = .01, \eta^2 = .16$ . As expected, those who had the highest GPA exhibited the lowest levels of academic procrastination, ( $M = 54.62, SD = 17.19$ ). Those who had the lowest GPA exhibited the highest levels of academic procrastination, ( $M = 83.33, SD = 16.62$ ). The more widely used Tuckman (1991) scale, however, did not find differences between GPA groups in terms of academic procrastination,  $F(3, 75) = 1.93, p = .13, \eta^2 = .07$ , suggesting that the current scale may have a better potential to accurately identify academic procrastination. Of note as well, conscientiousness and the APS were highly correlated ( $r = -.59$ ). The correlation table of relevant variables in the pilot study is displayed in Table 1.2.

Table 1.2 Intercorrelations from Pilot Study

	1	2	3	4	5	6	7
1. Academic Procrastination Scale	.95						
2. Tuckman Procrastination Scale	.84**	.92					
3. Openness to Experience	-.14	-.19	.87				
4. Conscientiousness	-.59**	-.72**	.06	.80			
5. Extraversion	-.09	-.24	.42**	.07	.86		
6. Agreeableness	-.19	-.21	.28*	.39**	.29*	.82	
7. Neuroticism	.17	.29*	-.23*	-.35**	-.34**	-.35**	.83

\*  $p < .05$  \*\*  $p < .01$

## CHAPTER 2

### METHODS

The goal of the current project was to examine and validate the refined Academic Procrastination Scale (APS). In order to effectively validate the new measure, proposed relations with other constructs were examined. Moreover, the current tool was compared against the widely used Tuckman (1991) scale and other scales purporting to measure procrastination. Finally, the current study examined the reliability and factor structure of the scale to determine the pattern of relationships among items.

#### 2.1 Participants

A total of 681 participants were recruited from the University of Texas at Arlington using SONA. SONA is an experimental subject pool consisting of students participating to obtain class credit. Undergraduate college students enrolled in psychology courses participated, and each student received one credit. Participants who signed up to participate in the survey and completed an informed consent were given a URL online link to a survey-hosting website.

A total of 218 (32%) males and 462 (68%) females participated. Participants had varied undergraduate experience with 268 (39.4%) freshman, 176 (25.9%) sophomores, 162 (23.8%) juniors, and 67 (9.9%) seniors. Participants also consisted of a variety of academic majors. One hundred and sixty (23.5%) participants were psychology majors, 159 (23.3%) were nursing majors, 86 (12.6%) were science majors, 73 (10.7%) were undeclared or undecided, 69 (10.1%) were education majors, 60 (8.8%) were liberal arts majors, 53 (7.8%) were business majors, and 14 (2.1%) participants were engineering majors. A diverse sample in regards to ethnicity was obtained. Two hundred and fifty-three (37.2%) participants considered themselves Caucasian, 171 (25.1%) Hispanic, 104 (15.3%) African American, 96 (14.1%) Asian, and 53

(7.8%) participants considered themselves to be multi-racial or of another ethnicity. The average age of participants was 21 years ( $SD = 4.70$ ).

## 2.2 Procedure

Before the study began, participants were directed to an informed consent page and notified of the general purpose of the study. Afterwards, participants were asked to complete a series of surveys used to assess academic procrastination (including the refined APS and other procrastination scales), general procrastination, personality and demographic characteristics. Information such as self-report GPA, SAT/ACT score, and academic success information were also obtained.

A section of the online survey asked participants to consent to releasing a portion of their academic records (SAT/ACT score information, cumulative GPA and semester GPA). The Office of Institutional Research, Planning, and Effectiveness provided this information upon the consent of participants. A total of 578 (84.9%) participants consented to releasing this information. The average SAT score of participants was 1039.71 ( $n = 379$ ,  $SD = 150.32$ ) and the average score on the ACT was 21.97 ( $n = 147$ ,  $SD = 3.75$ ). The mean grade point average was 2.77 ( $n = 566$ ,  $SD = 0.84$ ) for the semester and 2.79 ( $n = 572$ ,  $SD = 0.74$ ) for the cumulative average.

## 2.3 Measures

Numerous different measures were used in the current study. First, the new Academic Procrastination Scale will be discussed followed by other procrastination scales and finally scales measuring personality and academic success.

### *2.3.1 Academic Procrastination Scale*

The APS was developed by means of a pilot study and the SONA participant pool at the University of Texas at Arlington. Item analysis, ensuring that items were highly correlated with total test scores, was used as one criterion for item selection. The APS consists of 25 items and has exhibited a high reliability,  $\alpha = .95$ . Using item discrimination indicators for item retention,



however, may have auto-inflated reliability to some extent. Nevertheless, reliability was extremely high. Further scale information will be provided throughout the results section. The APS was validated using 86 undergraduates consisting of diverse academic majors and years of college completion. Items were scored using a 5-point Likert-type scale where 1 indicates disagree with the item and 5 indicates agree with the item. For example, a participant who agrees to the question “I put off projects until the last minute” would be indicative of an individual who procrastinates to a greater extent. Appendix A displays all items on the APS. Items were reverse scored for all scales when applicable, and a total across items was created.

### *2.3.2 Procrastination Scale*

Tuckman (1991) developed a scale which purportedly measures procrastination tendencies. However, the items themselves tend to be geared towards an academic participant pool and have been widely used to measure academic procrastination (Klassen & Kuzucu, 2009). Tuckman (1991) reported a reliability of  $\alpha = .86$  whereas another study reported average reliabilities of .89 (Steel, 2010). The Procrastination Scale (PS) consists of 16-items which are scored on a four-point Likert scale (i.e. 1 = *that's me for sure*, 2 = *that's my tendency*, 3 = *that's not my tendency*, 4 = *that's not me for sure*). An example item is “I am an incurable time waster.” Appendix B displays all items for the PS.

### *2.3.3 General Procrastination Scale*

The General Procrastination Scale was also used in the current study. Lay (1986) developed a 20-item measure of general procrastination scored on a 5-point Likert-type scale ranging from 1, extremely uncharacteristic, to 5, extremely characteristic. However, items are not specific to academic procrastination and Lay (1986) did not find a significant correlation between general procrastination and GPA. Indeed, the GPS includes items supposedly assessing procrastination in general lifestyle behaviors (e.g. I always seem to end up shopping for birthday or Christmas gifts at the last minute). The GPS, however, has been found to have

adequate reliability in procrastination research studies,  $\alpha = .84$  (Steel, 2007). Appendix C displays items on the GPS.

#### *2.3.4 Procrastination Assessment Scale for Students*

Solomon and Rothblum (1984) proposed a measure of academic procrastination based on the analysis of six areas of academic functioning. The scale assesses the degree to which students procrastinate in those areas and also the degree to which that procrastination is a problem. Studies have found adequate average reliability,  $\alpha = .80$ , for the 12 item scale (Steel, 2010). The scale is scored on a 5-point Likert scale where 1 indicates that the student *never procrastinates* in that area, 2 indicates *almost never*, 3 indicates *sometimes*, 4 indicates *nearly always* and 5 indicates *always procrastinates* in that area. Likewise, on the degree to which procrastination is a problem, 1 indicates *not at all a problem* and the fifth anchor indicates *always a problem* while the middle three anchors are similar. Appendix D displays all items on the PASS.

#### *2.3.5 Active Procrastination Scale*

The next procrastination scale that was used for the current study was the Active Procrastination Scale. Choi and Moran (2009) attempted to expand research on procrastination to include a different form of procrastination which is functional and results in desirable outcomes. This resulted in a 16-item scale with adequate reliability,  $\alpha = .80$ . The scale purports to measure preference for time pressure, the intentional decision to procrastinate, the ability to meet deadlines, and satisfaction with the outcomes. The scale is scored on a 7-point Likert-type scale ranging from responses of 1, *not at all true*, to 7, *very true*, of self-reported procrastination. Items on the active procrastination scale are displayed in Appendix E.

#### *2.3.6 Academic Success*

Grade point average is the most widely used measure of academic success. It was measured by obtaining participant permission to obtain academic records. Participant GPA was recorded both cumulatively and for the semester in which they participated. Alternatively,

Scholastic Aptitude Test (SAT) and American College Test (ACT) scores were recorded. However, semester GPA was used as the primary academic success variable.

### *2.3.7 Conscientiousness*

Measures of conscientiousness were obtained using the 44-item Big Five Inventory (John, Donahue & Kentle, 1991). Conscientiousness is a unique facet of personality and displays a tendency to seek achievement and plan, coordinate and regulate behavior.

## CHAPTER 3

### RESULTS

#### 3.1 Data Screening

Prior to analysis, all variables were examined and screened to determine if they met the assumptions for regression. In all, only 59 participants skipped one or more questions on the APS. The overall APS score was developed by summing responses on individual items. Thus, these 59 participants were not included in the present analyses. Analyses were conducted to examine if there was a pattern to the missing values. Those participants who did not answer questions on the APS did not have significantly different GPA scores, did not differ on levels of conscientiousness, and did not have significantly different SAT scores. Thus, removal of these individuals was warranted.

All variables in the present study were examined for normality. According to the normality plots and skewness and kurtosis statistics, all five procrastination scales were normally distributed. The personality variable, conscientiousness, also exhibited adequate normality. There were at least 622 participants who completed each of the five procrastination scales in their entirety. SAT data was obtained from 379 participants and semester GPA data was obtained from 566 participants.

Outliers were assessed for each variable, as well. Some participants did score extremely low on the SAT (score below 800) and exhibited low semester GPA scores (below 1.00). However, due to the objective nature of the data (data was obtained from official academic records) and their relatively low influence on the average, these outliers were retained. According to Nunnally and Bernstein (1994), multicollinearity becomes a problem with variance inflation factors (VIF) greater than ten. Multicollinearity was assessed between the procrastinations scales and was not a problem (highest VIF = 4.42). Regression diagnostics

were also analyzed to determine if any univariate or multivariate outliers possessed any influence on the analyses. It was determined that no cases substantiated deletion or replacement in the current data set. Homogeneity of variance was examined during each analysis and also was not problematic.

### 3.2 Introductory Analyses

The overall internal reliability of the APS was .94 according to Cronbach's alpha. These results are consistent with the previous reliability estimate from the pilot study. According to classical test theory, the individual items comprising the scale should correlate with the total scale. The items themselves did, in fact, correlate highly with the total scale. The range of corrected item-total correlations was .41-.73. All other scales of procrastination also exhibited adequate reliability ( $\alpha_{\text{range}} = .81 - .92$ ).

The Academic Procrastination Scale (APS) was scored using a classical test theory approach, meaning that separate responses to the 25 individual items were summed to create an overall score for the scale. Scores on the APS ranged from 25-125 ( $M = 72.25$ ,  $SD = 20.00$ ). Appendix A displays the individual items on the Academic Procrastination Scale. An individual who answers strongly agree to such items as "I have found myself waiting until the day before to start a big project" and "I get distracted by other, more fun, things when I am supposed to work on schoolwork" is indicative of an individual who exhibits more academic procrastinatory tendencies.

Overall, the averages for the individual items tended to fall in the middle of the scale. The averages for the individual items varied slightly, however, and ranged from 1.73 ("Tests are meant to be studied for just the night before") to 3.41 ("When working on schoolwork, I usually get distracted by other things"). Although the item averages tended to be fairly consistent, individuals tended to disagree with the item "Tests are meant to be studied for just the night before," and should thus be examined with caution in further studies employing the APS.

Nevertheless, the standard deviations were fairly uniform and ranged from 1.04 to 1.36 demonstrating that the spread from the mean was fairly consistent.

Scores on the 16-item Tuckman (1991) scale ranged from 16-63 ( $M = 38.37$ ,  $SD = 9.23$ ). Scores on the 20-item GPS ranged from 20-96 ( $M = 58.76$ ,  $SD = 12.66$ ), scores on the 12-item PASS ranged from 12-48 ( $M = 33.45$ ,  $SD = 8.10$ ), and scores on the 16-item active procrastination scale ranged from 20-92 ( $M = 65.86$ ,  $SD = 14.73$ ). Appendices B, C, D and E display items from the Tuckman (1991) scale, the General Procrastination Scale, the Procrastination Assessment Scale for Students and the Active Procrastination Scale, respectively. Agreeing to items such as “I am continually saying “I’ll do it tomorrow” and “I’m a time waster now but I can’t seem to do anything about it” are indicative of individuals with more procrastinatory tendencies.

Convergent validity was assessed by examining the correlation of the APS with the previously validated scales of procrastination. The new procrastination scale was significantly positively correlated with the Tuckman (1991), Lay (1986), and Solomon and Rothblum (1984) scales. Interestingly, though, the Choi and Moran (2009) scale was negatively related to the other four scales. This can be explained in their definition of active procrastinators as those who are “able to complete tasks before deadlines and achieve satisfactory outcomes,” which is different from the traditional definition of procrastination as a negative behavioral tendency (p. 96). Also, whereas most procrastination scales tend to measure procrastination on a bipolar continuum (e.g. procrastination vs. non-procrastination), the Choi and Moran (2009) scale tends to measure solely procrastination and its spread of outcomes. See Table 3.1 for the reliabilities and correlation table of procrastination scales and variables used in the main analyses.

Table 3.1 Intercorrelations of Scores on Academic Procrastination Scale and Relevant Factors

	M(SD)	1	2	3	4	5	6	7	8	9	10
1. APS	72.25(20.00)	.94									
2. Tuckman (1991)	38.37(9.23)	.70**	.92								
3. Lay (1986)	58.76(12.66)	.64**	.81**	.87							
4. Choi & Moran (2009)	65.86(14.73)	-.17**	-.24**	-.20**	.81						
5. Solomon & Rothblum (1984)	33.45(8.10)	.53**	.64**	.63**	-.25**	.85					
6. Conscientiousness	31.30(6.22)	-.57**	-.69**	-.69**	.26**	-.50**	.81				
7. Age	21.01(4.70)	-.23**	-.24**	-.22**	.12**	-.15**	.27**	~			
8. Semester GPA	2.77(0.84)	-.23**	-.15**	-.08	.11**	-.18**	.16**	.00	~		
9. Cumulative GPA	2.79(0.74)	-.24**	-.16**	-.07	.11*	-.16**	.16**	.01	.89**	~	
10. SAT score	1039.71(150.32)	.11*	.12*	.12*	.08	.02	-.15**	-.19**	.32**	.35**	~

Reliabilities are labeled along the diagonal where appropriate. \*  $p < .05$  \*\*  $p < .01$

### 3.3 Analyses

For a concise list of hypotheses, methodologies, and results please refer to Table 3.2.

Table 3.2 Hypotheses, Methodology and Results

Hypothesis	Methodology	Results
<b>H1</b> Conscientiousness will be positively related to academic success.	Regression IV: Conscientiousness. DV: Semester GPA.	$\beta = .16$ , $t(548) = 3.73$ , $p < .001$ , $r^2 = .03$ . <b>Supported</b>
<b>H2</b> Scores on the newly developed Academic Procrastination Scale (APS) will negatively correlate with measures of conscientiousness.	Regression IV: Conscientiousness. DV: APS	$\beta = -.57$ , $t(606) = -16.99$ , $p < .001$ , $r^2 = .32$ . <b>Supported</b>
<b>H3</b> Scores on the APS will negatively correlate with academic success.	Regression IV: APS DV: Semester GPA.	$\beta = -.23$ , $t(514) = -5.43$ , $p < .001$ , $r^2 = .05$ . <b>Supported</b>
	Baron and Kenny (1986) Regression Step 1) IV: Conscientiousness DV: Semester GPA	Step 1) $\beta = .16$ , $t(548) = 3.73$ , $p < .001$ . <b>Supported</b>
	Step 2) IV: Conscientiousness DV: APS	Step 2) $\beta = -.57$ , $t(606) = -16.99$ , $p < .001$ . <b>Supported</b>
	Step 3) IV: APS CV: Conscientiousness DV: Semester GPA	Step 3) $\beta = -.21$ , $t(501) = -3.78$ , $p < .001$ . <b>Supported</b>
<b>H4</b> The relationship between conscientiousness and academic success will be mediated by academic procrastination.	Step 4) IV: Conscientiousness CV: APS DV: Semester GPA	Step 4) $\beta = .03$ , $t(501) = 0.56$ , $p = .58$ . <b>Supported (Full mediation)</b>
<b>H5</b> The new measure of academic procrastination will exhibit incremental validity beyond conscientiousness in predicting academic success.	Hierarchical Regression IV: APS CV: Conscientiousness DV: Semester GPA	$\Delta F(1, 501) = 14.32$ , $p < .001$ , $\Delta R^2 = .03$ . <b>Supported</b>
<b>H6</b> The APS will positively correlate with the Tuckman (1991) scale.	Regression IV: Tuckman (1991) Scale DV: APS	$r = .70$ , $p < .001$ . <b>Supported</b>



Table 3.2 - Continued

<p><b>H7</b> The new measure of academic procrastination will exhibit incremental validity beyond the widely used Tuckman (1991) scale in predicting academic success.</p>	<p>Hierarchical Regression</p>	<p>IV: APS CV: Tuckman (1991) Scale DV: Semester Grades</p>	<p><math>\Delta F(1, 490) = 15.98, p &lt; .001, \Delta R^2 = .03.</math> <b>Supported</b></p>
<p><b>H8</b> The APS will exhibit incremental validity beyond the preexisting scales on procrastination in relating to academic success.</p>	<p>Hierarchical Regression</p>	<p>IV: APS CV: Tuckman (1991) Scale CV: Choi and Moran (2009) Scale CV: Solomon and Rothblum (1984) Scale CV: Lay (1986) Scale DV: Semester Grades</p>	<p><math>\Delta F(1, 413) = 11.70, p &lt; .001, \Delta R^2 = .03.</math> <b>Supported</b></p>

IV: Independent variable. DV: Dependent variable. CV: Covariate/Control variable

3.3.1 Hypothesis 1

Conscientiousness is supposedly one of the most stable predictors of academic success (Cheng & Ickes, 2009). In accordance with this contention, the first hypothesis predicted that conscientiousness would be positively related to grade point average. Using regression analysis, it was determined that conscientiousness significantly predicted semester GPA,  $\beta = .16, t(548) = 3.73, p < .001, r^2 = .03$ . Thus, the first hypothesis was supported.

3.3.2 Hypothesis 2

The second hypothesis proposed that conscientiousness and procrastination were negatively related. Thus, as an individual increasingly plans, coordinates and regulates activities he or she delays such activities less. The second hypothesis was supported. Conscientiousness was highly negatively related with measures of academic procrastination as recorded by the Academic Procrastination Scale,  $\beta = -.57, t(606) = -16.99, p < .001, r^2 = .32$ .

### 3.3.3 Hypothesis 3

However, more recently, researchers have posited that academic behaviors such as procrastination can also account for academic success. Thus, the third hypothesis predicted that the scores on the APS would be negatively correlated with semester GPA. The third hypothesis was supported. Scores on the APS significantly predicted, and were correlated with, semester GPA,  $\beta = -.23$ ,  $t(514) = -5.43$ ,  $p < .001$ ,  $r^2 = .05$ .

## 3.4 Mediation Analyses

### 3.4.1 Hypothesis 4

Hypothesis four predicted that academic procrastination would mediate the relationship between conscientiousness and academic success. In order for mediation to occur, there must first be an observed relationship between the independent variable and dependent variable (C Path). Refer to Figure 3.1 for the mediation model. In this case, it was determined previously that conscientiousness predicted academic success,  $\beta = .16$ ,  $t(548) = 3.73$ ,  $p < .001$ . Mediation also requires that a relationship exist between the independent variable and the mediator (A Path, Baron & Kenny, 1986). In this case, conscientiousness and procrastination were significantly related,  $\beta = -.57$ ,  $t(606) = -16.99$ ,  $p < .001$ .

According to Baron and Kenny (1986), two more steps must be met in order for mediation to occur. First of all, the mediator needs to significantly predict the dependent variable after controlling for the independent variable (B Path). After controlling for conscientiousness, procrastination still significantly predicted grade point average,  $\beta = -.21$ ,  $t(501) = -3.78$ ,  $p < .001$ . Secondly, to establish that there is complete mediation, the relationship between the independent and dependent variable must become non-significant after controlling for the mediator (C' Path). Indeed, after controlling for procrastination, conscientiousness was not able to significantly predict grade point average,  $\beta = .03$ ,  $t(501) = 0.56$ ,  $p = .58$ . Thus, the fourth hypothesis was supported and the relationship between conscientiousness and academic success was fully mediated by academic procrastination.

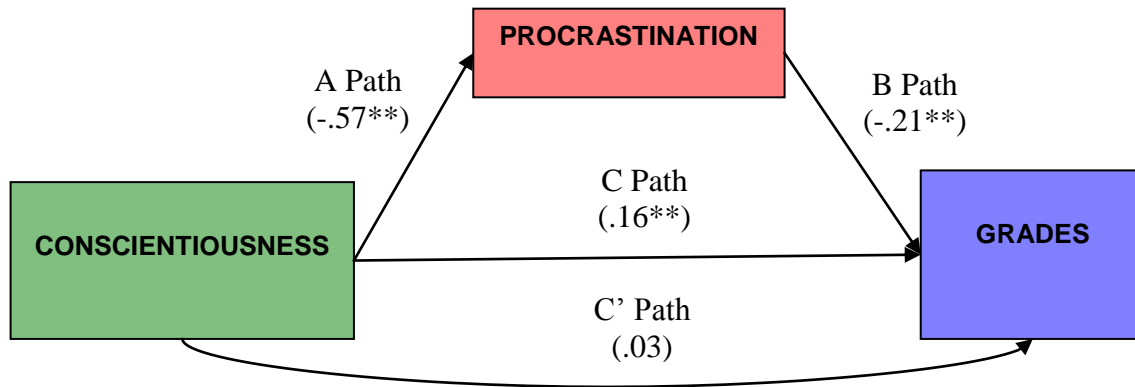


Figure 3.1 Proposed mediation model and paths. Numbers in parentheses represent standardized regression weights. \*\*  $p < .01$ .

### 3.5 Incremental Validity Analyses

#### 3.5.1 Hypothesis 5

It was proposed that the APS would exhibit predictive ability in regards to academic success in school. Moreover, the fifth hypothesis stated that academic procrastination would exhibit incremental validity beyond conscientiousness in predicting grades. Hierarchical linear regression was used to test the hypothesis where conscientiousness was entered into the first block of the equation predicting grades in school and academic procrastination was added second. The results supported the fifth hypothesis. Academic procrastination added incremental validity in the prediction of grades,  $\Delta F(1, 501) = 14.32, p < .001, \Delta R^2 = .03$ . Although this indicates that only three percent of the variance in grades was uniquely predicted by the procrastination scale, this number can become quite important and signify the difference between an 'A' and a 'B' in a college class.

#### 3.5.2 Hypotheses 6 and 7

However, the current study also wanted to ascertain if the APS could determine grades beyond what is predicted by the more widely used Tuckman (1991) scale. Although the two scales were both highly correlated,  $r = .70, p < .001$ , supporting the sixth hypothesis, the APS exhibited incremental validity in the prediction of grades,  $\Delta F(1, 490) = 15.98, p < .001, \Delta R^2 =$

.03. Thus, hypothesis seven was also supported. Again, three percent of the variance in grades was uniquely predicted by the APS after controlling for the Tuckman (1991) scale.

### 3.5.3 Hypothesis 8

Hypothesis eight predicted that the new scale would add incremental validity, above and beyond the four most widely used procrastination scales, in predicting grades. Hypothesis eight was supported. The APS added incremental validity in the prediction of grades above and beyond the other scales,  $\Delta F(1, 413) = 11.70, p < .001, \Delta R^2 = .03$ . Scores on the APS,  $\beta = -.29, t(413) = -3.42, p < .001$ , the Choi and Moran (2009) scale,  $\beta = .14, t(413) = 2.74, p < .01$ , and Lay (1986) scale,  $\beta = .25, t(341) = 2.92, p < .01$ , were all unique predictors of grades in school. All of the scales collectively accounted for approximately eight percent of the variance in grades whereas the APS uniquely contributed three percent.

## 3.6 Exploratory Analyses

SAT scores are routinely used to predict academic success in college. However, what if behavioral indicators such as academic procrastination could add predictive ability to grades in school? This was analyzed by looking at both SAT scores and scores on the APS simultaneously using regression. Both SAT scores,  $\beta = .35, t(341) = 7.07, p < .001$ , and academic procrastination,  $\beta = -.22, t(341) = -4.38, p < .001$ , were unique predictors of grades in school. In fact, both predictors were able to collectively account for approximately 16% of the variance in grades.

The results indicate that as individuals score one standard deviation better on the SAT (147 point increase), they attain a .35 standard deviation increase in semester grade point average (.29 point increase). Results also indicate that if individuals score one standard deviation higher on the APS (18.39 point increase), indicating more procrastination, they attain a .22 standard deviation decrease in semester grade point average (.18 point decrease). Both SAT scores and academic procrastination were unique predictors of grades in school, indicating that if an individual performed both poorly on the standardized test (one standard deviation

below the mean) and procrastinated more than the average individual, he or she would experience nearly a half-point decrease in semester GPA. Thus an individual would attain a GPA of 2.53 rather than a 3.00 for the semester, a significant drop according to some individuals.

A social desirability scale was also included in exploratory analyses to detect students who were replying in a manner that project favorably. It was believed that students might downplay the instances in which they procrastinate by either lying or altering their answers. Using a shortened version of the Marlowe-Crowne Social Desirability Scale (Reynolds, 1982; Crowne & Marlowe, 1960), and sorting individuals into socially desirable or not based upon their means, the current study found that participants who projected themselves in a “good light” reported significantly lower levels of academic procrastination,  $F(1, 608) = 12.47, p < .001$ . Those individuals giving socially desirable answers reported lower levels of procrastination ( $M = 69.90, SE = 1.08$ ), than those individuals not giving socially desirable answers, ( $M = 75.59, SE = 1.19$ ). The same trend was found for the other procrastination scales. Thus, social desirability comes into play with self-report measures of academic procrastination. Since procrastination is generally a negative behavior, students might tend to downplay its presence.

### *3.6.1 Exploratory Factor Analysis*

An exploratory factor analysis was also conducted in order to examine the dimensionality of the new Academic Procrastination Scale. A principal component analysis (PCA) using a Varimax rotation was conducted on the 25 items of the APS. The Kaiser-Meyer-Olkin measure indicated that the sample was more than sufficient for analysis,  $KMO = .96$  (‘superb’ according to Field, 2009). Multicollinearity between the variables was not a problem according to Haitovsky’s (1969) test,  $\chi^2_H(300) = .002, p > .05$ . Four components had eigenvalues over Kaiser’s criterion of 1, and collectively explained approximately 57.85% of the variance. The scree plot was examined, however, and indicated that one component would best

represent the data. In fact, when only one component was extracted, all but 2 items loaded higher than .50.

This main factor accounted for approximately 42.50% of the variance and the second highest factor only accounted for 6.40% of the variance. According to Hatcher (1994), another criterion for retaining components is the proportion of variance accounted for. A generally accepted guideline is to retain components that account for more than 10% of the total variance. All factors except for the first were below this threshold. Thus, when examining the 1) scree plot criterion and the 2) variance-accounted-for criterion, results indicated that all the items of the APS best represent a single underlying factor.

### 3.6.2 Test Bias

To determine if scores on the APS systematically varied with such irrelevant variables as gender, ethnicity, academic major, and academic year, an Analysis of Variance (ANOVA) was performed. The results suggested that scores on the APS did not vary by gender,  $F(1, 594) = 0.99, p = .32$ , ethnicity,  $F(4, 594) = 1.85, p = .12$ , major,  $F(7, 594) = 1.43, p = .19$ , or year,  $F(5, 594) = 0.74, p = .59$ . Thus, the APS did not discriminate between these groups. However, scores on the Lay (1986) scale discriminated between majors,  $F(7, 608) = 2.69, p = .01$ , whereas scores on the Choi and Moran (2009) scale discriminated between genders,  $F(1, 618) = 6.81, p < .01$ , with males reportedly procrastinating more than females, and ethnicities,  $F(4, 618) = 2.72, p = .03$ , with Caucasians reportedly procrastinating more than Asians.

Not only are mean differences important to consider, but so is the ability of a tool to systematically predict outcomes across groups. Such test bias can be evaluated by a framework developed by Cleary (1968) and as reinterpreted by Lautenschlager and Mendoza (1986). When developing a scale, it must be determined that the test scores do not vary as a function of irrelevant or discriminatory (age, ethnicity, gender) variables when regressed on the criterion of interest. The criterion of interest in this case is overall GPA. Thus, the Lautenschlager and Mendoza (1986) approach will determine if the APS predicts overall GPA

equally across groups. The test is a step-down approach where an omnibus test of slope and/or intercept differences is performed first. Following a significant omnibus test, slope differences and intercept differences are tested separately.

According to the preceding test bias approach, there was no test bias for gender. Thus, Males and Females did not experience any slope bias (regression line of APS on GPA was roughly the same) or intercept bias (Males and Females had roughly the same cumulative GPA across all levels of the APS). Test bias was also examined for ethnicity. A significant omnibus test indicated that differences could possibly exist between Caucasians and African Americans. After following up with slope and intercept tests, it was determined that there was a significant intercept difference between the groups. The results indicated that Caucasians at any given level of APS test score tended to have a higher overall GPA than African Americans at the same level of APS test score. In other words, grade point average would be underestimated for Caucasians relative to African Americans based on the same scores on the APS. See Figure 3.2. Although not as pronounced, intercept differences also existed between Caucasians and Hispanics where Caucasians tended to have a higher overall GPA at all levels of the APS when compared to Hispanics. See Figure 3.2.

### Test Bias: Intercept Differences between African Americans, Caucasians and Hispanics

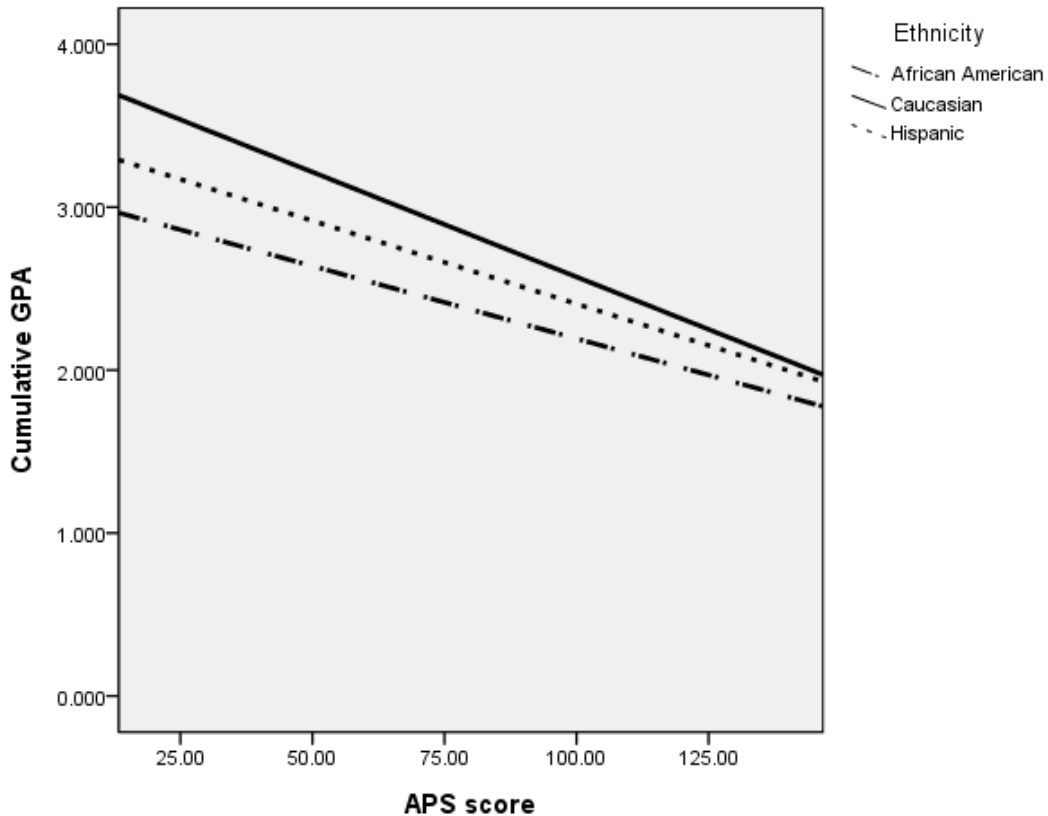


Figure 3.2 Intercept Bias of the APS between African Americans, Caucasians and Hispanics

However, the Academic Procrastination Scale fared much better than the Tuckman (1991) scale in regards to test bias. In fact, intercept bias existed between Males and Females where Females at any given level of the Tuckman scale tended to have a higher overall GPA than Males at the same level. Both intercept differences (Caucasians tended to have a higher overall GPA at all levels of the Tuckman scale when compared to African Americans) and slope differences (Caucasians tended to have a lower overall GPA at higher levels of procrastination whereas African Americans tended to have a roughly similar GPA across all levels of procrastination) existed between Caucasians and African Americans. Slope differences also



existed between Caucasians and Hispanics where Caucasians tended to have a higher overall GPA at all levels of the Tuckman scale when compared to Hispanics.

### 3.6.3 *Abbreviated Scale*

Although the internal consistency of the APS was quite high indicating item consistency, .94 according to Cronbach's alpha, it is also symptomatic of redundant items. Thus, it is believed that the current scale could be reduced to a lesser number of items to allow for quicker administration while also retaining adequate reliability. The possibility of reducing the number of items was assessed by examining the corrected item-total correlation of each item. A generally accepted cut-off value of .70 was used and five items fell above this threshold (Nunnally & Bernstein, 1994). Thus, the possibility of reducing the scale from 25 items to five items was examined. Items 2, 4, 7, 17, and 23 were retained and examined in regards to a shortened scale. See Appendix A for items.

The cronbach's alpha of the 5-item scale was still deemed quite reliable at .87 (Nunnally & Bernstein, 1994). To determine if the shorter scale would still prove superior to the other scales at predicting academic success, Hypothesis 8 was re-run. The hypothesis was still supported when using the reduced 5-item scale. The shortened APS still added incremental validity in the prediction of grades above and beyond the other scales,  $\Delta F(1, 437) = 4.52, p = .03, \Delta R^2 = .01$ . The 5-item scale also added incremental validity in the prediction of grades over and above conscientiousness supporting the fifth hypothesis,  $\Delta F(1, 537) = 11.15, p = .001, \Delta R^2 = .02$ , and over and above the Tuckman (1991) scale supporting the sixth hypothesis,  $\Delta F(1, 522) = 8.01, p < .01, \Delta R^2 = .02$ . Thus, the results validated the possible reduction of the scale to five items.

## CHAPTER 4

### DISCUSSION

The main objective of the current study was the validation of a previously constructed scale that attempted to measure the construct of academic procrastination. The current study not only examined the reliability and validity of the Academic Procrastination Scale, but also sought to examine the scale in light of the four most widely used scales of procrastination and in relation to the personality variable of conscientiousness.

Before examining or studying a psychological construct, one must first be able to accurately measure it. Although scales have been proposed to measure procrastination, to date, very little research has attempted the construction of a scale to measure academic procrastination. This is shocking considering that academic procrastination is perhaps the most prevalent of all outlets of procrastination.

As evidenced by the high internal consistency,  $\alpha = .94$ , a valid and homogenous scale was developed in the current study. Scores on the 25-item scale exhibited high reliability and participants were quite consistent in their reporting of academic procrastination, providing support for a self-report scale of academic procrastination. Although deemed quite reliable, a high internal consistency can be indicative of redundant items. Thus, the study also succeeded in validating a shorter five-item Academic Procrastination Scale without sacrificing reliability. Consequently, the APS can be administered in either the 25-item version or the shortened 5-item version. A shortened scale allows users to either imbed such a scale into more thorough evaluations or to quickly and effectively measure academic procrastination. A shortened scale could also be combined with the more standardized Scholastic Aptitude Test to enhance the effectiveness of collegiate selection procedures.

When combined together, both the APS and SAT are more effective at predicting academic success than solely relying on SAT scores. SAT scores are routinely used by colleges and universities to predict academic success during an individual's first year of college. Nevertheless, the current study found that a behavioral indicator, namely academic procrastination, has the potential to add predictive validity to such a selection procedure. In fact, the APS makes the selection procedure 5% more effective. Concentrating on behavioral indicators of academic success is a relatively unexplored avenue of research. Academic procrastination should be the focus for future research trying to predict success in college. Colleges have become overly reliant on standardized test scores to the extent that they are neglecting other potentially useful indicators such as academic procrastination.

In addition, as substantiated by the extremely high correlation and convergent validity between the Academic Procrastination Scale and the Tuckman (1991) scale, the newly constructed APS was theoretically measuring a facet of procrastination. Indeed, the APS was significantly correlated with four widely noted scales measuring procrastination. Even so, some studies have noted that academic procrastination is simply an extension of other variables, such as conscientiousness (Steel, 2007). The current study performed a factor analysis in order to reveal the factor structure of the APS and determine if other variables uniquely explained academic procrastination. The analysis yielded a one-factor solution. Thus, the scale was indicative of one construct, academic procrastination, rather than a combination of constructs such as conscientiousness, time-management, or laziness. Thus, the APS should be regarded as measuring a unique construct indicative of academic procrastination.

Measures of personality have routinely been used to predict success in school. The first hypothesis predicted that conscientiousness would positively relate to academic success. This hypothesis was supported. As seen in Table 3.1 conscientiousness exhibited a significant positive correlation with both indicators of academic success, semester GPA and cumulative

GPA. As a person was more dependable, organized and responsible, he or she performed better in school.

Research has found that the effect of conscientiousness on GPA is generally small (Noftle & Robins, 2007). Nevertheless, researchers tend to agree that small effect sizes can make drastic differences in a student's life. For example, Conard (2006) found that only a standard deviation increase in conscientiousness can result in a substantial increase in GPA. Thus, personality factors could be the difference between an 'A' student and a 'B' student.

The second hypothesis predicted that the personality construct of conscientiousness would be negatively related to scores on the APS. This hypothesis was also supported. Conscientiousness and academic procrastination were highly negatively related. Personality psychologists have long since stated that personality characteristics are able to account for behavioral tendencies (Davis & Palladino, 2007). In fact, some even define personality as "a relatively stable pattern of thinking, feeling, and behaving" (p. 477). In this case, conscientiousness, being organized and dependable, was highly related to the behavioral response of procrastination.

Although some studies have indicated that procrastination and conscientiousness are mutually independent (Steel, 2007), psychometricians indicate that tests are considered alternative-forms of one another if their correlation is too large (Nunnally & Bernstein, 1994). Typically, such alternate-form correlations occur when the correlation coefficient is greater than .70. The current study supported the hypothesis that academic procrastination and conscientiousness are highly negatively related. However, in accordance with Steel (2007), the two variables, although highly related, are believed to be two separate and distinct constructs. As individuals possess greater conscientiousness, they procrastinate less academically.

However, both the Tuckman (1991) and Lay (1986) scales exhibited extremely high negative correlations with conscientiousness. In fact, their correlations seemed to suggest that the two scales were nearly alternate-forms of the conscientiousness scale. Thus, it is believed

that the current Academic Procrastination Scale better differentiates between the personality variable of conscientiousness and the behavioral response of procrastinating. The differentiation between procrastination and academic procrastination is extremely important. Although the two are highly correlated, it is believed that conscientiousness is a character trait and less malleable than academic procrastination. Thus, although the results indicating that higher conscientiousness correlates with greater academic success is interesting, individuals will find it hard, if not impossible, to change personality. Academic procrastination, being a distinct behavioral construct that can be willingly manipulated, allows individuals the prospect of altering academic success.

Indeed, the third hypothesis predicted that academic procrastination would accurately predict, and be negatively correlated with, grades in school. Over a decade ago, Wesley (1994) proposed that procrastinatory behaviors could predict grades in school. The current study tested this assertion with the new procrastination scale and found that procrastination did exhibit a significant relationship with grades in school. When examining both conscientiousness and academic procrastination, procrastination even exhibited a stronger relationship with grades. Thus, the current research found that the behavioral tendency of academic procrastination can better predict academic success when compared to personality factors.

Wesley (1994) examined how scores on the SAT could be used in conjunction with work behaviors such as procrastination in predicting grades in college. He asserted that if a short scale could be developed and validated, it could be used to augment the usefulness of other predictors in selecting incoming freshman in college. The current study reinforced this belief and found that scores on the APS predicted variance in college grades beyond that predicted by the SAT. In line with Wesley's (1994) findings, procrastination "makes a significant contribution to predictive accuracy" in determining grades (p. 408). The implications are important in that college admissions offices, recruiters and those in education could more solidly

select highly qualified individuals by incorporating the current scale on academic procrastination.

The fourth hypothesis predicted that conscientiousness, in and of itself, does not fully predict a person's grades in school. Instead, it was predicted that the behavior of academic procrastination mediated this relationship. This hypothesis was also supported. There have been numerous studies that have supported the notion that conscientiousness is a unique predictor of academic performance (Conard, 2006; Nofle & Robins, 2007). Some studies have established that behavioral characteristics such as class attendance mediate the relationship between conscientiousness and grades (Conard, 2006). However, no studies, to the author's knowledge, have looked at the behavioral tendency of procrastination as a possible mediator. The current mediational model and the development of the Academic Procrastination Scale add new theory to the assessment of academic grades. Academic procrastination can, according to the fifth hypothesis, account for variance in academic outcomes above and beyond conscientiousness. Although personality factors such as conscientiousness are diverse and stable constructs, academic procrastination has the potential to be more defensible in academic settings for its generalization towards academic work. This is because behaviors are much more objective and identifiable as compared to personality constructs.

The validity of the APS was examined by means of the sixth hypothesis which predicted that the APS would significantly correlate with the most widely used procrastination scale, the Tuckman (1991) scale. This hypothesis was supported. Both the Tuckman (1991) scale and the APS were highly correlated. However, they were so highly correlated as to be alternate-forms according to Nunnally and Bernstein (1994). However, the APS proved superior at accounting for variance in grades in school, supporting hypothesis seven. In most academic settings, the accurate prediction of grades in school is by far the most widely sought-after goal. Thus, it would seem that although the two scales are highly correlated, they possess apparent differences in the prediction of grades.

The validity of the APS at predicting grades, above and beyond the four traditional procrastination scales, was examined in hypothesis eight. The APS proved far superior at predicting grades in school. In fact, when examined above and beyond the four scales, the APS accounted for approximately 3% more variance. Thus, researchers and practitioners utilizing the APS can be confident that it is assessing unique facets of procrastination and that it can better predict academic success above and beyond other procrastination scales.

The current scale of academic procrastination has numerous potential uses for practitioners. For example, almost all universities and colleges examine SAT scores and other academic success indicators for selection purposes. However, the current research found that the APS can add significant validity to such a selection procedure. Thus, applicants could be more effectively screened and administrators could gain better insight into a student's actual behavioral tendencies. This proposal is especially important for universities because attendance is increasing with more and more high school graduates enrolling in college. In fact, the current university nearly doubled in attendance over the past seven years and witnessed an all-time high in attendance the semester in which the study was conducted. Selecting potential students from such an immense applicant pool means that the university must discriminate between potentially successful and unsuccessful academic performance. The APS can help universities in doing this.

Another outlet of the Academic Procrastination Scale is its possible use in the development and remediation of students. If procrastination is consistently found to be negative (Steel, 2007; Lay, 1986; Solomon & Rothblum, 1984), then students who exhibit higher scores on the APS could be given training on such things as time management, distractions, and personal initiative. Furthermore, those who academically procrastinate could be placed in instructive settings where they are educated on study tactics and factors that could possibly ameliorate its effects.

#### 4.1 Limitations

There were, however, some limitations to the current study that can reduce its utility. First of all, although the Academic Procrastination Scale seems to be both valid and reliable, there can be problems when attempting to use such a scale for selection purposes. Students might attempt to fake on questionnaires that are important for admissions decisions. Although the scale added incremental validity to the SAT and together predicted nearly 20% of the variance in grades in college, the students seemed to be giving socially desirable answers.

A social desirability scale was included in the current study to detect students who were replying in a manner that projects favorably. Thus, it was believed that students might downplay the instances in which they procrastinate. The current study found that participants who projected themselves in a “good light” using a social desirability scale reported significantly lower levels of academic procrastination. Thus, the current scale should not be used in its current state for selection purposes since students can readily lie. However, if told the scale is to be used for remediation purposes, students might answer more truthfully and openly.

A major limitation to any scale is test bias. Test bias occurs when there are systematic differences in predictions across groups. In the current study, the Academic Procrastination Scale should solely discriminate grades on the basis of academic procrastination rather than on irrelevant differences such as gender or ethnicity. For example, a biased test would be one in which Caucasians scored a 72 on the APS and possessed a significantly higher GPA than African Americans who also scored a 72. In this example, race would be predicting differences in GPA rather than test scores. This was, indeed, the case in the current study and also occurred between Hispanics and Caucasians. This could potentially be a problem for the current scale.

However, before “crying ‘bias’ too loudly” on a test, these differences need to be evaluated (Lautenschlager & Mendoza, 1986). It would seem that test bias did not seem to be an Academic Procrastination Scale problem, but rather an issue with college Grade Point



Average. Indeed, upon further examination, differences existed between ethnic groups in terms of their GPA. Asians possessed the highest cumulative GPA at 3.04 ( $n = 79$ ), Caucasians possessed an average cumulative GPA of 2.86 ( $n = 222$ ), Hispanics an average of 2.65 ( $n = 145$ ), and African Americans an average of 2.46 ( $n = 83$ ). Thus, there was a significant difference in terms of GPA between Caucasians and Hispanics, and Caucasians and African Americans. Indeed, the Lautenschlager and Mendoza (1986) test bias approach emphasizes that bias may exist between groups in regards to the criterion of interest, in this case GPA. This seemed to be the case in the current study because ethnicity test bias was also found on the Tuckman (1991) scale. Thus, the APS might not be biased, but relevant differences might exist between ethnicities in regards to GPA. Future studies should further evaluate test bias for the APS using a broader range of performance criteria.

Another potential limitation is presented in the very high internal consistency. Although a high internal consistency shows a highly consistent test which most might argue is a positive outcome, it is also symptomatic of redundant items. Indeed, the items on the 25-item scale exhibited extremely high correlations with one another. If the scale were to be used in applied settings, it could be reduced from a 25-item scale to five items and still retain adequate reliability. A shorter scale would allow for quicker evaluations and increases in applicability. Indeed, a shorter 5-item scale was evaluated and still added predictive ability in regards to academic success over and above the other procrastination scales. Thus, the current author recommends future research to examine the validity and reliability of the proposed abbreviated five-item scale.

The current study consisted of a majority of females and nearly half of participants were either nursing or psychology majors. Additionally, only 67 participants were seniors and 14 were engineering majors. Thus, the results of the current study might not generalize to all students. However, the mean difference bias analyses conducted did not demonstrate any differences for these majors, and these are arguably relatively diverse majors. Furthermore, the study was

conducted on undergraduates and might not generalize to high school or grade-level students. Thus, future studies need to examine the applicability of the current scale in alternate populations.

In addition, future studies should examine the impact of common method variance. It is posited that high correlations between the procrastination scales and other scales could be a by-product of using one large questionnaire with very similar scales. It is possible that participants were answering very similarly across the different scales and that this recurrent method, in turn, caused spurious results. Although steps were taken to eliminate biased answering and participants were eliminated for exhibiting the same pattern of answering across scales, this common method variance could still have posed a problem in the current study. However, the current scale predicted above and beyond the other scales, demonstrating the current scale has some important contribution not captured by the others. Moreover, GPA was not self-report – it was collected from the university– in turn reducing the potential detriments of mono-method bias.

Nevertheless, the current study succeeded in developing a valid and reliable scale upon which to measure academic procrastination in undergraduate students. Not only did the current scale correlate substantially with previously validated scales on procrastination such as the Tuckman (1991) Procrastination Scale, the Lay (1986) General Procrastination Scale, and the Solomon and Rothblum (1984) Procrastination Assessment Scale for Students, but the current scale exhibited incremental validity above and beyond those scales in the prediction of academic grades. The current scale also predicted grades above and beyond a well-known personality characteristic, conscientiousness. In fact, the current study found that scores on the academic procrastination scale mediated the well-known relationship between conscientiousness and grades. Thus, both a more valid and reliable scale measuring academic procrastination was developed.

APPENDIX A

ACADEMIC PROCRASTINATION SCALE

The following questions assess your habits and routines as a student. Please answer the following as they apply to yourself.

How much do you, yourself agree to the following statements? (Scored on a 1 to 5 scale where 1= Disagree and 5= Agree)

1. I usually allocate time to review and proofread my work.\*
2. I put off projects until the last minute.
3. I have found myself waiting until the day before to start a big project.
4. I know I should work on school work, but I just don't do it.
5. When working on schoolwork, I usually get distracted by other things.
6. I waste a lot of time on unimportant things.
7. I get distracted by other, more fun, things when I am supposed to work on schoolwork.
8. I concentrate on school work instead of other distractions. \*
9. I can't focus on school work or projects for more than an hour until I get distracted
10. My attention span for schoolwork is very short.
11. Tests are meant to be studied for just the night before.
12. I feel prepared well in advance for most tests. \*
13. "Cramming" and last minute studying is the best way that I study for a big test.
14. I allocate time so I don't have to "cram" at the end of the semester. \*
15. I only study the night before exams.
16. If an assignment is due at midnight, I will work on it until 11:59.
17. When given an assignment, I usually put it away and forget about it until it is almost due
18. Friends usually distract me from schoolwork.
19. I find myself talking to friends or family instead of working on school work.

20. On the weekends, I make plans to do homework and projects, but I get distracted and hang out with friends.
21. I tend to put off things for the next day.
22. I don't spend much time studying school material until the end of the semester.
23. I frequently find myself putting important deadlines off.
24. If I don't understand something, I'll usually wait until the night before a test to figure it out.
25. I read the textbook and look over notes before coming to class and listening to a lecture or teacher. \*

\* Indicates reverse-scored items

APPENDIX B

TUCKMAN PROCRASTINATION SCALE

How much are the following indicative of yourself?

1= That's not me for sure

2= That's not my tendency

3= That's my tendency

4= That's me for sure

1. I needlessly delay finishing jobs, even when they're important.
2. I postpone starting in on things I don't like to do.
3. When I have a deadline, I wait until the last minute.
4. I delay making tough decisions.
5. I keep putting off improving my work habits.
6. I manage to find an excuse for not doing something.
7. I put the necessary time into even boring tasks, like studying.\*
8. I am an incurable time waster.
9. I'm a time waster now but I can't seem to do anything about it.
10. When something's too tough to tackle, I believe in postponing it.
11. I promise myself I'll do something and then drag my feet.
12. Whenever I make a plan of action, I follow it.\*
13. Even though I hate myself if I don't get started, it doesn't get me going.
14. I always finish important jobs with time to spare.\*
15. I get stuck in neutral even though I know how important it is to get started.
16. Putting something off until tomorrow is not the way I do it.\*

\* Indicates reverse-scored items

APPENDIX C

GENERAL PROCRASTINATION SCALE



On the following pages you will find a series of statements which people may use to describe themselves. Read each statement and decide whether or not it describes you. You are asked to rate yourself by indicating the extent to which each statement is characteristic or uncharacteristic of you. (Scored on a 1 to 5 scale where 1= extremely uncharacteristic and 5= extremely characteristic),

1. I often find myself performing tasks that I had intended to do days before.
2. I do not do assignments until just before they are to be handed in.
3. When I am finished with a library book, I return it right away regardless of the date it's due.\*
4. When it is time to get up in the morning I most often get right out of bed.\*
5. A letter may sit for days after I write it before mailing it.
6. I generally return phone calls promptly.\*
7. Even with jobs that require little else except sitting down and doing them, I find they seldom get done for days.
8. I usually make decisions as soon as possible.\*
9. I generally delay before starting on work I have to do.
10. I usually have to rush to complete a task on time.
11. When preparing to go out, I am seldom caught having to do something at the last minute.\*
12. In preparing for some deadline, I often waste time by doing other things.
13. I prefer to leave early for an appointment.\*
14. I usually start an assignment shortly after it is assigned.\*
15. I often have a task finished sooner than necessary.\*
16. I always seem to end up shopping for birthday or Christmas gifts at the last minute.
17. I usually buy even an essential item at the last minute.

18. I usually accomplish all the things I plan to do in a day.\*
19. I am continually saying "I'll do it tomorrow".
20. I usually take care of all the tasks I have to do before I settle down and relax for the evening.\*

\* Indicates reverse-scored items

APPENDIX D

PROCRASTINATION ASSESSMENT SCALE for STUDENTS

Areas of Procrastination

For each of the following activities, please rate the degree to which you delay or procrastinate. Rate each item on an “a” to “e” scale according to how often you wait until the last minute to do the activity. Then indicate on an “a” to “e” scale the degree to which you feel procrastination on that task is a problem.

**I. WRITING A TERM PAPER**

1. To what degree do you procrastinate on this task?

Never Procrastinate	Almost Never	Sometimes	Nearly Always	Always Procrastinate
a	b	c	d	e

2. To what degree is procrastination on this task a problem for you?

Not At All a Problem	Almost Never	Sometimes	Nearly Always	Always a Problem
a	b	c	d	e

**II. STUDYING FOR EXAMS**

3. To what degree do you procrastinate on this task?

Never Procrastinate	Almost Never	Sometimes	Nearly Always	Always Procrastinate
a	b	c	d	e

4. To what degree is procrastination on this task a problem for you?

Not At All a Problem	Almost Never	Sometimes	Nearly Always	Always a Problem
a	b	c	d	e

**III. KEEPING UP WITH WEEKLY READING ASSIGNMENTS**

5. To what degree do you procrastinate on this task?

Never Procrastinate	Almost Never	Sometimes	Nearly Always	Always Procrastinate
a	b	c	d	e

6. To what degree is procrastination on this task a problem for you?

Not At All a Problem	Almost Never	Sometimes	Nearly Always	Always a Problem
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a                      b                      c                      d                      e

**IV. ACADEMIC ADMINISTRATIVE TASKS: FILLING OUT FORMS, REGISTERING FOR CLASSES, GETTING ID CARD**

7. To what degree do you procrastinate on this task?

Never Procrastinate	Almost Never	Sometimes	Nearly Always	Always Procrastinate
a	b	c	d	e

8. To what degree is procrastination on this task a problem for you?

Not At All a Problem	Almost Never	Sometimes	Nearly Always	Always a Problem
a	b	c	d	e

**V. ATTENDANCE TASKS: MEETING WITH YOUR ADVISOR, MAKING AN APPOINTMENT WITH A PROFESSOR**

9. To what degree do you procrastinate on this task?

Never Procrastinate	Almost Never	Sometimes	Nearly Always	Always Procrastinate
a	b	c	d	e

10. To what degree is procrastination on this task a problem for you?

Not At All a Problem	Almost Never	Sometimes	Nearly Always	Always a Problem
a	b	c	d	e

**VI. SCHOOL ACTIVITIES IN GENERAL**

11. To what degree do you procrastinate on this task?

Never Procrastinate	Almost Never	Sometimes	Nearly Always	Always Procrastinate
a	b	c	d	e

12. To what degree is procrastination on this task a problem for you?

Not At All a Problem	Almost Never	Sometimes	Nearly Always	Always a Problem
a	b	c	d	e

APPENDIX E

ACTIVE PROCRASTINATION SCALE

On the following pages you will find a series of statements which people may use to describe themselves. Read each statement and decide whether or not it describes you.

Scored on a 7-point Likert scale where 1= Not at all true and 7= Very true.

1. My performance tends to suffer when I have to race against deadlines\*
2. I don't do well if I have to rush through a task\*
3. If I put things off until the last moment, I'm not satisfied with their outcomes\*
4. I achieve better results if I complete a task at a slower pace, well ahead of a deadline\*
5. It's really a pain for me to work under upcoming deadlines\*
6. I'm upset and reluctant to act when I'm forced to work under pressure\*
7. I feel tense and cannot concentrate when there's too much time pressure on me\*
8. I'm frustrated when I have to rush to meet deadlines\*
9. To use my time more efficiently, I deliberately postpone some tasks
10. I intentionally put off work to maximize my motivation
11. In order to make better use of my time, I intentionally put off some tasks
12. I finish most of my assignments right before deadlines because I choose to do so
13. I often start things at the last minute and find it difficult to complete them on time\*
14. I often fail to accomplish goals that I set for myself\*
15. I'm often running late when getting things done\*
16. I have difficulty finishing activities once I start them\*

\* Indicates reverse-scored items

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## BIOGRAPHICAL INFORMATION

Justin D. McCloskey grew up in the Dallas/Ft. Worth metroplex where he graduated in the top 5% of his High School class. Mr. McCloskey attended Midwestern State University in Wichita Falls, Tx where he graduated *summa cum laude* after three years with a Bachelor of Arts degree in Psychology and a minor in American History. He went on to attend the University of Texas at Arlington, earning a Master of Science degree in Industrial and Organizational Psychology after completing his research and thesis on academic procrastination. He currently works at PepsiCo, one of the largest food and beverage manufacturers, where he utilizes his knowledge of I/O Psychology in an organizational development and human resources role. Justin plans on staying in the DFW metroplex with his family and wife, Cindy, where he hopes to continue to further society's greatest asset: human capital.