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Preparation Anxiety as a Self-Defeating Behavior: Scale Development and Reliability

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DEDICATION

To Nat Flor, for all your love and support.

ABSTRACT OF THE DISSERTATION

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by

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Research indicates that anxiety is inversely related to academic performance. Many students engage in self-defeating behaviors (e.g., procrastination) that negatively affect their academic performance. While a large body of research has explored how anxiety can affect academic performance at the point of performance (e.g., test anxiety), research has failed to focus on a second possibility, in which anxiety affects performance by affecting the quality of an individual's preparation. *Preparation anxiety* refers to anxiety directed toward the work required to prepare for a performance, rather than toward the performance itself, and it often provokes individuals to put off or avoid preparation.

The current research was focused on developing a measure of *preparation anxiety*, The Preparation Anxiety Scale (PAS). Focus groups were conducted to generate items relating to *preparation anxiety*. An exploratory factor analysis identified a 32-item, three-factor solution. The three factors that emerged were identified as *behavioral*

avoidance, *cognitive stress*, and *affective nerves*. Overall, the scale displayed good internal consistency reliability and test-retest reliability. Additionally, the PAS exhibited convergent and discriminant validity.

The PAS was found to be positively related to constructs such as procrastination, self-handicapping, depression, test anxiety, and trait anxiety. The PAS was negatively related to constructs such as self-esteem, self-liking, and self-competence. Overall, the current work helps to present an alternate view of struggling students, one in which students are not necessarily lazy, but are instead avoiding work as a result of anxiety. Implications and future directions are discussed.

List of Tables

List of Figures

TABLE OF CONTENTS

Introduction

Imagine a scenario in which a student has a big final exam coming up. Passing this exam is highly important to their future in their current major. The exam has been on their mind for the past week and they are concerned about it, but keep pushing it out of their thoughts. Eventually, they realize the exam is in several days and they have yet to study, as they have been putting it off. They sit down to study, but suddenly there is a knock on their door. It is their roommate asking if they are hungry and want to go grab a bite to eat. Now that they think of it, it is actually dinnertime and they have yet to eat, so they decide a quick break will not hurt them. However, one thing leads to the next, and by the time they get back to their dorm room, they convince themselves it is a bit late to study. They feel worried that they wasted the evening, but they justify it by telling themselves that they are better off just spending the rest of the night relaxing and getting all of the work done at once tomorrow. Finally, it is time for the exam and they feel they are unprepared. This is a scenario seen all too frequently in students. Again, and again, we witness students engaging in self-defeating behaviors that prevent them from reaching their full potential. Why would a student engage in behaviors that lessen their chance of success? Research suggests that anxiety may be a factor prompting such behavior; however, there is still not a clear picture of how this works.

While a substantial amount of research has been done on the relationship between academics and anxiety (or academics and self-defeating behavior as a whole), it is not correct for us to assume that we have the full picture of this relationship. Much of the current research has looked at how anxiety impairs performance directly, such as

literature focusing on test anxiety (Sarason, 1980), math anxiety (Richardson & Suinn, 1972), and stereotype threat (Steele & Aronson, 1995). The aforementioned research studies on these have all independently documented that the experience of anxiety impairs performance on complex tasks such as tests or presentations. In fact, even when examining scenarios that involve self-defeating behavior occurring in the weeks leading up to a performance, researchers often assume that it is a more abstract fear about the performance itself that drives self-sabotage. Consequently, they assume that performance anxiety is driving this behavior, and while anxiety surrounding the outcome may be at the core of both types of anxiety, they do not necessarily function in the same fashion. Therefore, theories have been advanced that suggest that self-defeating behaviors, or even reports of anxiety, are strategic attempts to avoid being judged and subsequently being found lacking (e.g., Smith et al., 1982), rather than attempts to preserve one's own self-esteem.

It is unfortunate that this type of anxiety is viewed in this manner because it obscures a second possibility, that in which anxiety encourages *compulsive avoidance*. It is likely that those who feel anxious when studying will compulsively self-sabotage by allowing themselves to become distracted or engage in procrastinating, whether they are cognizant of this behavior or not. These compulsive behaviors can happen completely independently from any strategic intent on the part of the individual. Instead, it is suggested that for individuals who are insecure about their abilities, the actual act of working or preparing produces anxiety, and this anxiety drives compulsive avoidance behaviors that compromise an individuals' ability to be productive.

This phenomenon is referred to as "*preparation anxiety*" – anxiety directed toward the work required to prepare for, or behaviors while preparing for, the performance and not necessarily directly occurring during the performance itself. There are several qualities that are believed to make *preparation anxiety* distinct from other constructs. First, the anxiety experienced during *preparation anxiety* is often such a slight, subtle, uneasy feeling that many individuals are unable to identify what exactly is troubling them in the moment, and they only recognize that they feel mildly negative or unsettled. Additionally, the anxiety may stem from a variety of different causes, from fear of failure to feelings of incompetence, from ambiguity to task adversity. This anxiety also decreases the individual's ability to cognitively engage with the problem so, frequently, instead of being able to solve the problem individuals become caught in a loop of avoidance. *Preparation anxiety* also tends to be self-reinforcing. Each time a person avoids preparation due to anxiety and feels better in the moment, it reinforces the likelihood of that individual avoiding preparation again. Finally, this behavior tends to operate on the unconscious level. As previously stated, individuals often only recognize that they feel uneasy or slightly unwell, but not why. For these reasons, it is important that *preparation anxiety* not just be incorporated in with general performance anxiety, as it is a completely separate construct with its own specific features.

The following dissertation had several objectives: a) to explore the literature related to anxiety and dysfunctional behavior, especially as it pertains to academics, b) to conduct focus groups to determine what the experience of *preparation anxiety* is like, c) to develop items based on focus group responses, d) to conduct exploratory factor

analysis on the items to develop a scale, e) to conduct reliability analyses on the scale, and f) to establish convergent and discriminant validity of the scale.

Literature Review

Anxiety

"The ordinary stresses and strains of life in the changing world today are such that few if any escape the need to confront anxiety and deal with it in some manner" (May, 1950, p. ix) This quote may sound as though written in modern times. In fact, you may have even come across a similar statement as recently as today; however, this statement was made by May in 1950 in his book *The Meaning of Anxiety*. In the book, May describes living in "an age of anxiety," based on a 1950 poem titled *The Age of Anxiety*. He believed this anxiety was fueled by the creation of the atomic bomb. Finally, attention was being brought to people's inner struggles, such as confusion, loneliness, and uncertainty.

May (1950) at least had the foresight to refer to the 1950s as "*an* age of anxiety" rather than "*the* age of anxiety." The world is currently experiencing another "age of anxiety" (or perhaps it is always "the age of anxiety" for those living in any given time), driven, at least in part, by the same sources of unease as before, political and economic unrest. A 2020 cross-sectional survey found that self-reported anxiety spiked from 7.97% in 2008 to 14.66% in 2018 among young adults, or those ages 18-25 years old (Goodwin et al., 2020). This is unsettling for a number of reasons. Young adults are a vulnerable population whose brains are still developing, and stress and anxiety have been shown to negatively influence brain development (e.g., Piccolo & Noble, 2018). Additionally,

experiences with subclinical anxiety early on in life lead to an increased risk of developing pathologies like anxiety disorder, depressive disorder, and substance use disorder (e.g., Goodwin, 2002). This could lead to lifelong effects on these individual's academics, job prospects, and social development.

History of Anxiety

While anxiety may be a particularly hot topic, and a pertinent issue today, anxiety has been a topic of interest dating back to the early philosophers and, later, the early physicians. Philosophers like Cicero and Seneca spoke of anxiety as worry about the past, future, and death. Early physicians distinguished anxiety from other forms of negative affect, such as sadness or fear, and viewed anxiety as a physical ailment rather than a mental one.

Early discussions of anxiety were deeply rooted in philosophy and medicine, but it was Freud that brought anxiety into the psychological sphere. Freud described anxiety-neurosis as being defined by nervousness, apprehension, and anxious expectation including, but not limited to, heart palpitations, perspiration, and tremors (Freud, 1924). Freud differentiated between anxiety and other unpleasant affective experiences like sadness, anger, or grief by its unique set of symptoms. Freud found that anxiety was difficult to describe, but it had certain qualities about it that made it different from other emotions. He also distinguished between objective anxiety and neurotic anxiety (Spielberger, 2013). Objective anxiety was essentially what would be considered fear, and it was experienced in the moment of a potential threat. Neurotic anxiety was thought to lead to the same symptoms of fear, apprehension, and physiological arousal as

objective anxiety but, instead of coming from an outside source, this form of anxiety came from within. These internal sources of anxiety were repressed and not consciously available to, or known by, the individual experiencing them. Like many other Freudian concepts, Freud believed these repressed sources of anxiety developed in childhood and, since they were unknown, remained "objectless" (i.e., they did not have a specific target). It was also believed that everyone experiences neurotic anxiety from time to time, but not everyone experiences it at a clinical level (Spielberger, 2013).

It was not until the mid-twentieth century that anxiety began to be recognized in ways similar to how modern anxiety is viewed. Prior to this time, anxiety had different terminologies depending on a number of circumstances, and it was thought to be more of a mood than an actual problem that could be treated or managed (Spielberger, 2013). However, with the publication of several major works on anxiety, (i.e., May's The Meaning of Anxiety) psychologists now had a working definition of anxiety, leading to an increase of experimental research on anxiety (Spielberger, 2013). Today, more is known about anxiety than ever before, but it is no secret that there is still more to learn, particularly in the realm of subclinical, or everyday, anxiety.

Definition and Facets

It is not necessarily easy to make a determination as to the proper way to define anxiety. The American Psychological Association (APA) website gives the following definition of anxiety:

> *n.* an emotion characterized by apprehension and somatic symptoms of tension in which an individual anticipates impending danger, catastrophe, or misfortune. The

> body often mobilizes itself to meet the perceived threat: Muscles become tense, breathing is faster, and the heart beats more rapidly (2021).

They go on to distinguish fear from anxiety and state that the two differ because fear is an appropriate, present-oriented, and short-lived response to an imminent threat, whereas anxiety is a future-oriented, long-lasting response to a diffuse threat (APA, 2021). This distinction, however, does not account for long-lasting reactions to a specific threat (e.g., *preparation anxiety*), nor does the definition imply that cognition plays a key role in the way we experience anxiety. Anxiety affects three separate, but related, aspects of an individual and it is important for definitions to include all three of these separate facets: the affective aspect (e.g., dread, panic, nausea), the behavioral aspect (e.g., avoidance, performance deficits), and the cognitive aspect (e.g., worry, negative self-talk). The dynamics between these facets are too crucial to ignore, with each component influencing the others, creating a complicated, tangled state of anxiety.

Because the three components are so interconnected, it can be difficult to determine symptom categorization, with the affective component perhaps being the most difficult to quantify, because of disputes related to the definition of emotion and its relation to physiology. Affect generally refers to a feeling or emotion. Anxiety can influence a person's affect in myriad ways, but it is most often associated with feelings of nervousness, dread, tension, and unease (e.g., Chernoff & Stone, 2014). These feelings settle over the individual, permeating down to their core, imbuing them with a sense of general unease (Torpy et al., 2007). However, it is often difficult to find the proper words to give an accurate depiction of the experience. Freud even stated that anxiety is difficult

to describe and possesses a particularness that separates it from other negative emotions. Freud also emphasized the feeling of dread as a component of anxiety (Freud, 1924). These emotions are also connected to the cognitive component that concerns an individual's thoughts. In regards to anxiety, these thoughts often contain themes of worry or frustration (Mathews, 1990; Taylor et al., 2019), whereas the behavioral component often concerns avoidance and weakened performance (Caruso et al., 1990; Dymond & Roche, 2009; Zeidner & Matthews, 2005).

Physiological Components of Anxiety

Early physicians may have had a reason for viewing anxiety as a physical ailment, as it has a strong physiological component. Like fear, anxiety can lead to the activation of a person's autonomic nervous system, triggering a physiological response (Ely, 1991; Lehrer, 1987). During these periods, several fight or flight-type events, meant to motivate an individual to action, take place in the body. The glandular aspects of digestion are slowed or stopped, resulting in dry mouth, heart rate and blood pressure increase, sweat gland activity increases (Ely, 1991), muscles become tense (Lehrer, 1987), and breathing becomes more rapid (Ely, 1991). There is also a release of stored sugar from the liver, preparing the body for action (Ely, 1991). This all may have been advantageous to our predecessors by providing benefits such as a greater blood supply available to the muscles (Lehrer, 1987). However, these physiological responses have remained present in instances where they are not beneficial. For instance, in the case of stage fright many people experience increased perspiration and heart rate, shakiness, and muscle tension (Lehrer, 1987). Such effects draw attention away from the performance and add an

additional hurdle to the performance that the individual must overcome (Ely, 1991; Steptoe, 1989).

Because this response does oftentimes have such detrimental effects on performance, specifically audience performances, a large body of literature has investigated how to relieve these symptoms (e.g., Studer et al., 2011). One method of dealing with the physiological response is known as differential relaxation. In this technique, people learn to identify low-level feelings of tension in their muscles and to consciously relax them (Jacobson, 1967). Medication can also be employed as a tool for handling the effects of stage fright. Beta-blockers have been discussed as a treatment option since the 1970s (Brantigan et al., 1979; James et al., 1977; Liden & Gottfries, 1974) and they have been prescribed for this purpose more frequently over time (Engelke & Ewell, 2011). These treatments are able to effectively suppress the physiological response to the stressor (Brantigan et al. 1979; Lehrer, 1987; Neftel et al., 1982), but it has been debated in the literature whether or not this is the ideal treatment for this condition (Lehrer, 1987). Some argue that eliminating a person's nervousness could actually lead to a poor performance since arousal is reduced (Lehrer et al., 1987).

Not only does anxiety have these short-term physiological effects, but it can also affect the body long-term. For instance, those who experience chronic anxiety have been found to also experience chronic illness such as gastrointestinal issues and heart disease (Mussell et al., 2008; Roest et al., 2010). Additionally, they report more sleep disturbances and disorders than those who do not experience long-term anxiety (Uhde et al., 2009). Anxiety has also been shown to temporally precede depression in children and

adolescents. This suggests that the long-term experience of anxiety may lead to the development of depression at a later time (Cole et al., 1998; Rice et al., 2004). If students are experiencing anxiety due to school, they may be at risk for developing future health problems.

State versus Trait

It is important to make a distinction between trait and state anxiety, two almost entirely different concepts. On the one hand, anxiety is the transitory period of arousal brought on by a stimulus, but on the other hand, it is thought of as a personality trait (Spielberger, 2013). For instance, if someone is referred to as an anxious person, we can deduce that this person is prone to worry and likely to become anxious in situations that would not elicit such a response in non-anxious individuals. State anxiety refers to the psychological and physiological reactions that result from a negative situation in a specific moment in time, where trait anxiety is just that, anxiety as a personality trait or personal characteristic (Leal et al., 2017). This trait anxiety describes the individual's difference in their tendency to experience state anxiety and tends to remain relatively stable over time (Leal et al., 2017).

According to some, anxiety is a unidimensional concept, such that the higher an individual's trait anxiety, the higher their state anxiety in threatening situations (Spielberger et al., 1970). However, others oppose this conceptualization and view trait and state anxiety as multidimensional. According to these researchers, state anxiety includes two dimensions: cognitive-worry and autonomic-emotional (Endler & Parker, 1991). Additionally, they identified four facets of trait anxiety that are related to certain

scenarios: a) social evaluation threat, b) physical danger threat, c) ambiguous threat, and d) threat in daily routines (Endler & Parker, 1991). More recently, research has found that trait anxiety is positively correlated with state anxiety when the anxiety is provoked by interpersonal threat, but the two are not related in instances of physical threat (Leal et al., 2017). This indicates that those high in trait anxiety respond differently to threatening stimuli than others, but only if there are interpersonal factors in play. In cases of physical threat, both those high and those low in trait anxiety behave similarly (Leal et al., 2017).

Anxiety and Performance

Clearly, there exists a link between anxiety and performance. Many people experience performance related anxiety, whether it be nerves while giving a speech or tension while completing an exam. Because anxiety can affect performance in so many different domains, its effects have been studied in a variety of contexts (e.g., music performances, test taking). Much of this research has focused on state anxiety in stressful performance situations with a large body of research finding a negative relationship between the two, such that the more anxious an individual is, the poorer they perform (e.g., Cassady & Johnson, 2002; Kleine, 1990; Sarason et al., 1990; Seipp, 1991). To a smaller degree, the relationship between trait anxiety and performance has also been investigated with similar findings (e.g., Byron & Khazanchi, 2011; Macher et al., 2012). However, there is a shortage of research investigating the relationship between anxiety prior to the performance and how it can affect preparation for the performance overall. If anxiety is affecting an individual's ability to prepare, then those individuals are at a disadvantage even before the performance begins, making them important to identify.

One area where anxiety may be especially pertinent is in the realm of academic performance. Research looking at anxiety and academic achievement has found mixed results. Seipp's (1991) meta-analysis looked at a compilation of 126 studies where anxiety was operationalized by physiological arousal, and there was found to be a negative correlation between anxiety and achievement (r = -.21). Moreover, different specific types of anxiety have been implicated in poor academic performance such as test anxiety, generalized anxiety, and math anxiety. The more specific the measure of anxiety, the closer its association with academic performance has been found to be (Seipp, 1991). This highlights the importance for distinct anxiety scales for each of the different types of anxiety. Additionally, associations between anxiety and academic performance have been found to be closer when anxiety is measured after the performance rather than before. This supports the theory that for some, anxiety may be at such a low level that they are unable to identify it in the moment, and do not realize they were anxious until after the fact.

Potential Antecedents

A variety of constructs have been implicated in the development of anxiety, especially as it pertains to academic endeavors. The following constructs have been associated with anxiety (e.g., generalized anxiety, test anxiety, performance anxiety) and are considered potential sources of *preparation anxiety*. While a performance, or another situational instance, could be considered an antecedent to anxiety, the focus here is on the psychological and dispositional antecedents.

Fear of Negative Evaluation. As a construct, fear of negative evaluation refers to an individual's tolerance of dealing with the idea of being judged and evaluated by other persons (Carleton et al., 2007). The trait is thought to be genetic to some degree, and it has been associated with trait anxiety and social avoidance (Stein et al., 2002). Additionally, fear of negative evaluation is associated with more general fears, anxiety, and other psychopathologies (Carleton et al., 2007; Miller, 1995). Unsurprisingly, research has supported the idea that the fear of negative evaluation is one of the underlying features of social anxiety (Carleton et al., 2007; Clark & Wells, 1995; Rapee & Heimberg, 1997).

The fear of negative evaluation also arises in an academic setting. A recent study by Downing et al. (2020) identified the fear of negative evaluation as the primary construct implicated in student's anxiety in active learning situations, or situations in which students engage in activities and discussions with other students. It makes sense that students with a high fear of negative evaluation would experience anxiety in such a social setting, as fear of negative evaluation is positively correlated with social anxiety (Carleton et al., 2007). However, in addition to its relationship with more blatantly social academic activities, fear of negative evaluation has also been associated with other forms of anxiety in an academic settings like test anxiety and math anxiety (Hembree, 1988; Hendel, 1980). This suggests that the fear of negative evaluation may be a driving force behind different types of anxieties, including *preparation anxiety*.

Performance-Avoidance Goals. In an academic setting, individuals can possess different types of achievement goals. They can be motivated by the possibility of being

better than others (performance-approach goal), by mastering the material (mastery goal), or by avoiding the appearance of incompetence compared to others (performance-avoidance goal) (Elliot & McGregor, 1999). Performance-avoidance goals are associated with higher levels of anxiety in general and lower achievement (Kaplan & Maehr, 2007; Midgley & Urdan, 2001). In addition, they have been found to be negatively related to exam performance, with test anxiety partially explaining this relationship (Elliot & McGregor, 1999).

Performance-avoidance goals (e.g., desiring to avoid appearing incompetent) have also been associated with higher math anxiety and the use of self-protective coping strategies like self-handicapping, low effort, procrastinating, and hiding grades and academic work from others (Covington, 1992; Midgley & Urdan, 2001; Skaalvik, 2018). These maladaptive coping strategies attempt to divert attention away from the individual's shortcomings and failures (Skaalvik, 2018). They are assumed to be driven by the motivation to maintain self-worth and avoid negative perceptions of the self, once again indicating that there may be a social concern aspect to anxiety (Skaalvik, 2018). These goals are also thought to be closely related to *preparation anxiety*. For example, performance-avoidance goals may lead to *preparation anxiety,* which may then result in the student engaging in self-handicapping.

The fear of failure, a strong influence in adopting performance-avoidance goals, is thought to be driven by shame (McGregor & Elliot, 2005; Thompson et al., 2008). Shame avoidance, which is marked by the avoidance of feelings of incompetence, is also highly

related to performance-avoidance goals, meaning that shame may be a factor behind *performance anxiety* as well (McLachlan et al., 2009).

Self-Esteem/Self-Efficacy. One factor that logically may cause anxiety in an academic context is self-esteem or self-efficacy. If one does not feel they have the knowledge or skills to master certain content, then they will likely be anxious about that material. In line with this theory, Hembree (1988) found self-esteem to be inversely related to test anxiety (i.e., lower self-esteem was related to higher test anxiety). Research has also found that self-esteem is inversely associated with statistics anxiety (Benson, 1989; Onwuegbuzie & Wilson, 2003; Zeidner, 1991). Moreover, research has found that self-esteem is inversely related to dysfunctional academic preparatory behaviors, like self-handicapping and procrastination (Beswick et al., 1988; Ferrari et al., 1998; Rebetez et al., 2015; Solomon & Rothblum, 1984; Steel & Klingsieck, 2016). However, the relationship between self-esteem and self-handicapping appears to be complicated. For example, some studies have found that those high in self-esteem self-handicap more in certain circumstances, like when they are able to enhance their success or when they are in public (Harris et al., 1986: Tice, 1991; Tice & Baumeister, 1990). Others have found that those lower in self-esteem self-handicap more (e.g., Zuckerman et al., 1998). However, Harris and Snyder (1986) propose that when there is an uncertain sense of self-esteem, where the individual experiences some self-esteem but is also riddled with self-doubt, that is responsible for self-handicapping behaviors.

Intolerance of Uncertainty. If being uncertain about a performance outcome is associated with self-handicapping, then it makes sense that those who are intolerant of

uncertainty would be even more likely to experience such effects. Individuals high in intolerance of uncertainty experience negative feelings surrounding uncertainty and the implications surrounding the outcomes of such uncertainty (Carleton et al., 2012). Compared to a non-clinical sample, those diagnosed with anxiety and depression have reported experiencing more intolerance of uncertainty (Carleton et al., 2012). Additionally, individuals high in intolerance of uncertainty have also been found to display higher levels of test anxiety and statistics anxiety (Li et al., 2021; Williams, 2013). Procrastination has also been predicted by uncertainty paralysis, a subfactor of intolerance of uncertainty which is characterized by feelings of paralysis and an inability to take action in the face of uncertainty (Fourtounas & Thomas, 2016). This describes *preparation anxiety* in that often, individuals wish to get the work done, but they are paralyzed by their anxiety.

Neuroticism. Neuroticism, one of the Big Five personality traits, describes an individual's predisposition towards experiencing a variety of negative emotions (e.g., anxiety, irritability, insecurity, emotionality). Unsurprisingly, neuroticism is positively related to anxiety and negatively related to academic achievement (Hakimi et al., 2011). Anxiety has been found to mediate the relationship between neuroticism and academic achievement, such that neurotic individuals experience more anxiety and thus decreased achievement (Furnham et al., 2006). Additionally, neuroticism predicts self-handicapping and other dysfunctional coping strategies like avoidance (Bobo et al., 2013; Ross et al., 2002; Watson, 2001; Zuckerman et al., 1998). Because neuroticism is linked to both

increased anxiety and maladaptive coping mechanisms, it is likely that it is related to *preparation anxiety* as well.

Direct Effects

Research on anxiety and academics has largely focused on what can be referred to as the *direct effects* of anxiety. These *direct effects* consist of what laypersons may consider to be stage fright or performance anxiety. Such effects lead to impairment at the point of performance, as they cause physiological arousal and cognitive impairment at the time of the performance. For instance, anxiety can lead to increased galvanic skin response, increased heart rate, feelings of panic, dizziness, and nausea (Cassady & Johnson, 2002). This physiological arousal is associated with decreased performance (Holroyd et al., 1978). Additionally, this anxiety affects one's cognitions and may cause "self-deprecating ruminations," which further negatively affect performance (Sarason, 1961, p. 201). So, while the "problem" may be overtly presenting itself at the point of performance, it likely began earlier with *preparation anxiety*. If so, then this suggests that treating *preparation anxiety* may also help to treat these direct performance effects for some individuals.

Music Performance Anxiety. Much of the research on performance anxiety has centered on music performance anxiety (MPA), which is the anxiety experienced by musicians during a musical performance. MPA is characterized by a rapid heart rate, nausea, dizziness, and trembling, in conjunction with worry about the event or its outcome (Steptoe, 1989). Though it seems logical that being well prepared would help to reduce the anxiety surrounding a performance, this has not been shown to be the case,

indicating that perceived competence is not the source of anxiety in this instance (Nagel, 1990).

Pertinent to *preparation anxiety*, several studies have looked at the timing of anxiety in music performance anxiety, meaning they took into account anxiety prior to, during, and after the performance. Research found that anxiety progressively increased as the performance approached (Ryan, 1998; Salmon et al., 1989). Additionally, Ryan (1998) found that there is a discrepancy between the peak perceived anxiety and peak physiological anxiety, with participants being unable to identify the point that their physiological arousal was highest. Overall, findings from these studies on the chronology of MPA indicate that more experienced performers experience a peak in anxiety prior to performance, while those who are less experienced experience the most anxiety at the point of the performance, suggesting that familiarity with performing may alleviate MPA (Taborsky, 2007).

Test Anxiety. More closely related to *preparation anxiety* is a concept known as test anxiety. While *preparation anxiety* is concerned with the anxiety experienced leading up to an exam, test anxiety is the anxiety concerned with the exam itself. It includes the phenomenological, physiological, and behavioral responses that result from worry over potential negative consequences of a poor performance (Zeidner & Matthews, 2005). This construct is largely believed to have two components: worry and emotionality (Friedman & Bendas-Jacob, 1997). Worry refers to cognitions concerning the individual's actual test performance, while emotionality refers to the individual's autonomic or physiological reactions to the situation (Liebert & Morris, 1967).

Additionally, test anxiety has been found to be related to increased general anxiety and trait anxiety (Beidel & Turner, 1988).

Test anxiety is thought to arise in situations where an individual feels the demands of the exam exceed their abilities (Hembree, 1988; Zeidner & Matthews, 2005). A meta-analysis examining 562 test anxiety studies found that test anxiety has a negative relationship with performance, such that greater test anxiety is associated with a poorer performance, and that this relationship is stronger for the worry component than the emotionality component (Hembree, 1988). Test anxiety was also found to be positively associated with fear of negative evaluation and poor study skills, and it was negatively associated with self-esteem (Hembree, 1988). In fact, one model, known as the deficit model, even looks at test anxiety as being the result of poor study skills. This states that the awareness of previous poor performances and knowledge of lack of preparation causes test anxiety (Hembree, 1988; Tobias, 1985). However, Hembree's (1988) meta-analysis found evidence in support of the interference model, rather than the deficit model. The interference model proposes that the anxiety interferes with an individual's recall, resulting in poor performance. Hembree (1988) found that cognitive-behavioral treatments reduced test anxiety, while study skills training did not have the same effect, indicating that test anxiety is more of a psychological problem than a poor study skills problem.

It has been suggested that test anxiety may be a more pervasive problem that affects individuals beyond just the test-taking moment. Beidel and Turner (1988) conducted a study with elementary school children in 3rd-6th grade, in which students

took part in two behavioral tasks: a vocabulary test in which their scores were going to be compared with other students and an oral reading task meant to serve as a control task in which performance was not being formally evaluated. They found that in both conditions test anxious individuals self-reported more negative cognitions and emotional duress and experienced significantly greater heart rate increases during the tasks than non-test-anxious individuals (Beidel & Turner, 1988). They concluded from this that, at least for some, test anxiety is not just experienced in a testing environment, but in any social-evaluative situation. Additionally, they found that test anxious students were more concerned with their popularity, physical competence, and academic performance. One unexpected difference revealed between test-anxious and non-test-anxious students was that the test-anxious students reported spending more free time alone (e.g., reading, watching tv), reported having fewer friends and *best friends*, and were more likely to report considering other children as enemies (Beidel & Turner, 1988). These interesting findings indicate that test anxiety, and possibly other forms of academic anxiety, are likely related to sociability and social concerns, at least to some degree.

Stereotype Threat. Stereotype threat attempts to explain the underperformance of disadvantaged groups in certain academic domains. Steele (1997) argued that the threat of stereotyping is actually responsible for underachievement and that the academic environment can be aversive to certain groups, reminding them of negative stereotypes held about members of their group. While most students experience some level of anxiety surrounding negative evaluations, those experiencing stereotype threat must deal with this concern, plus the additional worry about personally confirming these negative group

stereotypes (Osborne, 2001). This additional concern leads to increased anxiety, which Steele (1997) argues negatively affects performance at each level of preparation, and not just at the point of the actual performance. For instance, a woman in engineering may not only worry about the difficulty of the material and mastering it, but also worry that if she fails to do so, she will serve as proof to others that women do not belong in engineering.

One of the main tenets of stereotype threat is that anxiety is exerting a direct negative affect on performance. Experimental results support the proposal that stereotype threat is related to increased anxiety (Osborne, 2007). When stereotype threat was manipulated, those in high-stereotype-threat conditions showed increased physiological reactions (e.g., skin temperature, blood pressure, skin conductance) than those in low-stereotype-threat conditions (Osborne, 2007). However, research has shown that not only does stereotype threat have this direct, in the moment effect, but it also affects the preparatory period leading up to the performance and the ability to develop one's skills to their full potential (Appel & Kronberger, 2012). According to this theory, stereotype threat at the exam phase is actually the final stage at which stereotype threat can impact performance. In the first stage, individuals in negatively stereotyped groups may disidentify from the domain altogether to reconcile any cognitive dissonance. For instance, an African-American student may convince themselves that they are not as interested in physics as they previously thought, and that they should pursue a different field. If disidentification does not occur, stereotype threat will affect the individual as they attempt to acquire skills and knowledge, especially if they highly identify with the domain at hand (Appel & Kronberger, 2012). Stereotype threat has been found to

interfere with several processes implicated in learning: encoding information (Taylor & Walton, 2011), summarizing materials (Appel et al., 2011), and rule comprehensions (Rydell et al., 2010). This research indicates that stereotype threat does not just directly affect performance in a test anxiety manner, but also indirectly affects performance by hindering the general learning process (Appel & Kronberger, 2012). Additionally, this research suggests that disadvantaged groups may be more susceptible to the effects of *preparation anxiety*, leaving them at an even greater disadvantage.

Math Anxiety. Math anxiety, a construct related to test anxiety, is defined by feelings of tension, disorganized thoughts, and physiological arousal in situations that include mathematical problem solving (Zeidner & Mattthews, 2005). Individuals who experience math anxiety have an emotional response surrounding numbers that impedes their performance on number-related tasks (Suárez-Pellicioni et al., 2016). Early on, Dreger and Aiken (1957) hypothesized that math anxiety is a separate and distinct construct from general anxiety. A meta-analysis on math anxiety supported this idea when Hembree (1990) found a correlation of .38 between math anxiety and trait anxiety, indicating that those who are high in trait anxiety are more likely to experience math anxiety, but that the two concepts are still distinct. Moreover, math anxiety, while positively related to test anxiety, is still its own construct (Suárez-Pellicioni et al., 2016). Several researchers have found that the two concepts share variance, but about a third of the variance in math anxiety can be explained by test anxiety (Dew et al., 1983; Hembree, 1990; Suárez-Pellicioni et al., 2016). This suggests that it is not likely that math anxiety is only restricted to a testing environment, but may arise in other instances too (Hembree,

1990). If math-anxious individuals experience anxiety anytime they are working with numbers, then it is likely that this is also affecting their ability to properly develop mathematics skills and may be related to *preparation anxiety* in some instances.

Indirect Effects

Anxiety can also have what can be referred to as more *indirect effects* on an individual's performance. Instead of leading to nervousness and physiological/cognitive problems at the point of performance, these *indirect effects* essentially sabotage an individual's ability to prepare for the performance. This type of anxiety affects performance, either by affecting the quality and quantity of preparation the individual can complete, or by leading them to avoid preparation altogether. While procrastination may be the most common behavior that comes to mind, some of the other more *indirect effects* of anxiety may include phenomena like writer's block, self-handicapping, and other dysfunctional behaviors. Additionally, constructs defined as having a *direct effect* on performance likely have *indirect* components that are overlooked. Therefore, while an individual may not be experiencing any of the direct effects of performance anxiety, such that anxiety is not directly influencing their performance, at the point of performance, they may still be experiencing some of the more indirect effects of anxiety. Because of these *indirect effects,* they will likely not be able to perform as well as they would have had they not been anxious in the first place, as *preparation anxiety* is thought to decrease an individual's ability to prepare, particularly their ability to prepare effectively.

Self-Handicapping. Self-handicapping can be defined as "any action or choice of performance setting that enhances the opportunity to externalize (or excuse) failure and to

internalize (reasonably accept credit for) success" (Berglas & Jones, 1978, p. 406). This allows individuals to place the blame for a poor performance on some external factor, such as some external obstacle to studying, rather than their own lack of competence. On the other hand, it also allows the individual to capitalize on their success if the opportunity arises, as they performed well *despite* some external factor, which disadvantaged them; they have overcome the obstacle. Imagine that a student goes out drinking the night before an exam. Now, if they do poorly on the exam they can claim that their hangover caused their poor performance, but if they do well, they are awarded with bragging rights – "I'm so smart that I can ace that test even when I am not at my best!" A variety of strategies can be used as a means of self-handicapping such as reduced practice effort (Harris & Snyder, 1986; Rhodewalt et al., 1984), use of performance-inhibiting drugs (Berglas & Jones, 1978; Jones & Berglas, 1978), traumatic life events (DeGree & Snyder, 1985), test anxiety (Smith et al., 1982), shyness (Snyder et al., 1985), hypochondria (Smith et al., 1983), and various other extenuating circumstances.

While the *direct effects* of anxiety take place at the point of performance, self-handicapping is an a priori strategy thought to be used as a method of ego-defense (Berglas & Jones, 1978). Self-handicapping is often assumed to preserve self-esteem through the utilization of Kelley's (1971) augmentation and discounting principles. According to these principles, less weight is given to any one cause when a variety of causes may be responsible for performance (discounting), and the power of any one perceived cause is augmented when an obstacle is overcome (augmentation). This means

that self-handicappers should be able to protect their self-esteem by attributing more of their success to an internal cause, their own skill or intelligence, when they succeed despite obstacles to performance (i.e., augmentation) and attribute more of their failure to external causes, such as the obstacle, when they fail (i.e., discounting) (Feick & Rhodewalt, 1997). However, while self-handicappers do show evidence of discounting, there is not much evidence to support the theory of augmentation (McCrea & Hirt, 2001; Rhodewalt & Hill, 1995). This means they do not feel as if it is entirely their fault if they fail, but they do not feel better about themselves if they succeed. Instead, it seems that self-handicappers are adopting a defensive attributional style in which they make more external, unstable, and uncontrollable attributions for both their successes and failures (Murray & Warden, 1992). One study supporting this theory found that individuals with a proclivity for self-handicapping made a greater number of external attributions for a poor test performance. However, these findings were much stronger for males than females (Rhodewalt & Hill, 1995). Another study, which was conducted with self-handicappers and non-self-handicappers found that when a task is thought to be indicative of one's abilities, non-self-handicappers are more likely to internalize success than failure, but self-handicappers show no such difference (Thompson & Richardson, 2001). Therefore, self-handicappers do not internalize success, being unsure about why they succeeded, thus their self-esteem does not increase when they succeed.

In addition to attempting to safeguard one's self-esteem for one's own sake, self-handicapping has also been thought to be used as an impression management tactic (Covington, 1992; Higgins, 1990; Kolditz & Arkin, 1982; Urdan & Midgley, 2001). This

means that self-handicappers are worried about appearing competent; therefore, they create obstacles upon which to blame potential failure (e.g., “it was not me, it was because I was not able to study the night before the test”). Several studies have been conducted looking at whether individuals are more or less likely to self-handicap in the presence of others, or when they believed others would know whether or not they self-handicapped (e.g., Kolditz & Arkin, 1982; Tice & Baumeister, 1990). Such studies have found that people self-handicap more if the choice is made in public than if it is made in private, and that those individuals who are high in public self-consciousness self-handicap more than those low in public self-consciousness (Kolditz & Arkin, 1982; Shepperd & Arkin, 1989). Findings, overall, indicate that self-handicapping it is not just about impression management, but serves to protect one’s ego for one’s own sake too. It seems self-handicappers are as concerned with protecting their image of themselves for their own sake as they are with protecting how they appear to others.

Self-handicapping is thought to occur specifically when individuals are uncertain about their own competence. Self-handicappers may have a chaotic reinforcement history, where they have been rewarded for reasons about which they are unsure. They may feel their successes were simply due to luck, and they begin to feel like *imposters*. Therefore, they may self-handicap because they are worried that they cannot reproduce success or because they feel their incompetence will eventually be unmasked by failure (Berglas & Jones, 1978). This indicates that these individuals are likely to be anxious or worried about their future performance or, in other words, they are likely to experience *preparation anxiety*.

While there have been studies done on self-handicapping and anxiety, these are largely focused on sports, rather than the academic domain (e.g., Prapavessis & Grove, 1994). For instance, athletes who reported high anxiety and tension before a competition, also had a higher tendency toward self-handicapping (Prapavessis & Grove, 1994). Those more prone to self-handicapping have also been shown to experience more cognitive state anxiety before competing (Prapavessis et al., 2003). Additionally, among youth athletes those who were high trait self-handicappers, or individuals with a higher likelihood or tendency to regularly engage in these behaviors, experienced more anxiety immediately before the event (Ryska et al., 1998). These results indicate that the uncertainty implicated in self-handicapping behaviors is likely part of the same mechanism that is causing these pre-competition jitters for these individuals.

One study by Kalyon et al. (2016), on narcissism and self-handicapping, found that self-handicapping can largely be explained by anxiety sensitivity, or "the fear originated by the beliefs that body sensations will have harmful physical, psychological, and/or social outcomes" (p. 238). The construct of anxiety sensitivity has also been implicated in the development of anxiety and anxiety-related disorders, such as social anxiety disorder, generalized anxiety disorder, posttraumatic stress disorder, hypochondriasis, and alcohol/substance use or abuse (Kalyon et al., 2016). It is important to note as well that several of these behaviors (e.g., hypochondria, alcohol/substance use or abuse) have been mentioned in previous literature as themselves being means of self-handicapping. For example, the use of alcohol as a self-handicapping technique is one of the first forms of self-handicapping ever discussed in the empirical literature (Jones &

Berglas, 1978). Additionally, social anxiety has been shown to be a method of self-handicapping. Socially anxious males reported experiencing more symptoms of social anxiety in a setting where they believed that these symptoms could account for a poor performance, indicating that they were using this social anxiety as an excuse (Snyder et al., 1985).

Procrastination. Procrastination is considered to be one of the largest components of *preparation anxiety*. It is thought that students with *preparation anxiety* begin to experience anxiety when they think about studying and/or when they attempt to study, causing them to continuously procrastinate and avoid. Procrastination can occur in any life domain; however, for the purposes of this dissertation the focus will be on academic procrastination. Steel (2007) defined academic procrastination as "to voluntarily delay an intended course of *study-related* action despite expecting to be worse off for the delay" (p. 37). About half of university students report procrastinating consistently (e.g., Solomon & Rothblum, 1984). Additionally, they report that up to a third of their day is spent engaging in procrastination activities such as sleeping or watching TV (Pychyl et al., 2000). It comes as no surprise that academic procrastination is consistently inversely related to academic performance (e.g., Tice & Baumeister, 1997).

Klingsieck (2013) proposed that there are four main perspectives on procrastination. First, there is the differential psychology perspective which views procrastination in the same way that we view personality traits. This perspective researches the relationship between the trait of procrastination and other traits

(Klingsieck, 2013). Conscientiousness and all of its facets have been inversely related to procrastination with procrastinators being more impulsive and having less self-discipline (e.g., Steel, 2007; Watson, 2001). Procrastination has also been found to significantly positively correlate with neuroticism (e.g., Johnson & Bloom, 1995).

Perfectionism is often considered in terms of procrastination. However, the relationship between the two can be unclear. Are perfectionists less likely to procrastinate because they know it will interfere with their work? Are they more likely to procrastinate because they need to find the time to do the task perfectly? While procrastination has been found to be positively related to perfectionism (e.g., Flett et al., 1995), Steel (2007) claims in his meta-analysis that procrastinators are less, not more, likely to be perfectionists. However, Pychyl and Flett (2012) argue that this is an unwarranted statement. The relationship between the two depends on how perfectionism is conceptualized and whether or not specific irrational beliefs are investigated (Flett et al., 1995). Pychyl and Flett (2012) go on to explain the profile of a perfectionistic procrastinator – someone who is self-critical, avoidant, and believes that every task they complete needs to be done perfectly. In line with this, procrastination has been inversely associated with self-esteem (e.g., Rebetez et al., 2015; Solomon & Rothblum, 1984).

Kingsieck's (2013) second perspective is the motivational and volitional psychology perspective, which states that there is an intention-action gap for procrastinators such that they fail to take action on their intentions. This is thought to be a problem with motivation (Steel, 2007). This perspective has found that a mastery goal orientation (e.g., Howell & Buro, 2009), an internal locus of control (e.g., Brownlow &

Reasinger, 2000), and increased self-efficacy (e.g., Haycock et al., 1998) can protect against procrastination.

The third perspective, the clinical perspective, focuses on the clinical attributes related to procrastination (Klingsieck, 2013). Procrastination has been linked with increased fear of failure (Haghbin et al., 2012; Solomon & Rothblum, 1984), anxiety (Flett et al., 1995; Rothblum et al., 1986; Spada et al., 2006), and depression (Flett et al., 1995; Spada et al., 2006; Uzun et al., 2014).

This perspective is important to the concept of *preparation anxiety* because although most individuals experiencing *preparation anxiety* likely do not have any diagnosable psychopathology, they are believed to be experiencing subclinical levels of these issues. In line with this theory, case studies have reported on individuals with such experiences. For instance, a series of papers look at one student who suffers from performance anxiety and displayed some depressive symptoms. The student was in his final year of university and experienced chronic worries about failing exams and completing academic requirements. It was shown how his self-doubt and self-criticism led to chronic avoidance tactics and how this chronic avoidance worsened his negative cognitions and fueled a cycle of doubt and avoidance (see Gabalda, 2010; Neimeyer, 2010). In addition to being linked with anxiety and depression, procrastination has also been investigated as a tactic for rebellion or revenge, but not much work has been done to investigate this theory (Ferrari & Emmons, 1994; Klingsieck, 2013).

One of the ways in which negative affect is imagined to affect procrastination is through irrational thinking or beliefs. McCown et al. (2012) conducted a study on self-

reported procrastinators and non-procrastinators where they reported their cognitions when they procrastinated. Procrastinators reported significantly more self-deprecation, other-deprecation, life-deprecation, and low frustration tolerance. This means they had more disparaging thoughts about themselves, about others, and about the conditions of their life. Additionally, they were less able to tolerate frustration (McCrown et al., 2012). Those high in procrastination have been found to experience more automatic negative thoughts, fear of failure, stress, neuroticism, and psychological distress (Flett et al., 2012; Stainton et al., 2000). From a motivational standpoint, high procrastination scores were associated with holding a performance avoidance orientation (Flett et al., 2012). Together, these findings support the idea that negative emotions are affecting student's ability to prepare.

The final perspective is the situational perspective, which instead of focusing on the person, focuses on the context and situation (Klingsieck, 2013). This context can include anything from difficulty of the task to specific characteristics of the instructor (Schraw et al., 2007). Surprisingly, it is not the poor instructors that promote procrastination; instead, students almost unanimously agreed that instructors who are well-organized, provide detailed syllabi, pace the course well, and provide regular detailed feedback unintentionally foster procrastination, as the students know exactly what to expect and can plan their procrastinating accordingly (Schraw et al., 2007). Additionally, instructors that are known to expect quality work were found to decrease procrastination, but increase performance anxiety, so it is possible that those prone to *preparation anxiety* would be prone to procrastinating under such circumstances,

compared to the general student population. While the focus of *preparation anxiety* is on the individual, and individual differences that may prompt dysfunctional behaviors (e.g., procrastination), it is possible that certain task characteristics may also trigger procrastination.

The indirect dysfunctional behaviors listed above are likely all different manifestations of *preparation anxiety*. All of these dysfunctional behaviors seem to share the same underlying cause of anxiety, and while related to the performance, are not the same as performance anxiety, yet no one has combined these phenomena together into one type of anxiety, *preparation anxiety*. While researching related forms of anxiety like test anxiety and other types of evaluation anxiety can help us to better understand *preparation anxiety* and give us a starting point, we need to also be able to address it on its own as an independent construct.

Again, *preparation anxiety* is defined as anxiety directed towards the work required to prepare for, or while preparing for, a performance and not necessarily directly occurring during the performance itself. Like Freud's description of anxiety, this feeling is often difficult to articulate. Additionally, it can frequently be subconscious, such that the individual cannot identify what they are experiencing, only that they feel unwell when attempting to study or thinking about studying. Like anxiety, it is thought that we all experience *preparation anxiety* from time to time, but that certain individuals tend to be higher in this characteristic and more prone to behave in this way. For these individuals, *preparation anxiety* likely breeds avoidance, which reduces anxiety in the moment, and thus, leads them to consistently opt for such maladaptive ways of coping.

Research Questions

The purpose of the current work was to interview students to determine the presence of *preparation anxiety*, to construct a scale to measure it, and to assess the psychometric properties of that scale. The current research focused on the following questions:

1) What are the properties of *preparation anxiety*? What are its underlying constructs?
2) Does the scale have convergent and discriminant validity? Is it related to constructs that it theoretically should be (e.g., trait anxiety, test anxiety)? Is it unrelated to concepts that it theoretically should not be (e.g., openness to experience)?
3) Is the scale reliable? Does the scale have good test-retest reliability?
4) How does *preparation anxiety* relate to other constructs (e.g., self-esteem)?

Methodology

The development of the Preparation Anxiety Scale (PAS) followed DeVillis' (2016) guidelines: a) determine what you would like to measure, b) generate an item pool, c) determine a scaling format, d) have experts review items, e) administer scale, f) optimize length. Details are outlined in the following section.

Population of Interest

The population of interest was undergraduate college students. This environment provides the ideal space for studying *preparation anxiety* given that students almost always have some anxiety-inducing performance on the horizon. This means that they likely have experience with *preparation anxiety*, and moreover, that the experience is fresh.

Item Development

Methods for item development can be deductive or inductive. Deductive methods are based around the pre-existing literature and scales that are already being used by researchers, whereas inductive approaches look at qualitative information regarding the construct from the population of interest (e.g., focus groups, expert panels) (Morgado et al., 2017). Items were developed for the preparation anxiety scale using a combination of approaches. Because *preparation anxiety* is hypothesized to be closely related to several already established constructs (e.g., anxiety, depression, test anxiety), existing scales and theory were reviewed. However, since *preparation anxiety* is a new concept, it was important to use an inductive approach as well.

Focus Groups

Focus groups were used to initially generate items thought to be pertinent to the preparation anxiety scale. Using focus groups allows responses to tap on each latent variable underlying the construct (Mallinckrodt et al., 2016). By going straight to the source and getting direct answers on the construct of interest *content validity* is ensured. Twenty-nine undergraduate students enrolled in an introductory psychology course participated in one-hour focus groups. Focus groups were led by trained researchers and consisted of one to five students per group ($M = 2.10$). Each interview adhered to a set of standard questions (see Appendix A) that were developed with the intention of focusing on the thoughts and behaviors of students during the period prior to an upcoming academic performance. Focus groups were audio recorded and transcribed later by research assistants.

The questions for the focus groups were designed to get at a few different aspects of the preparatory period. To ensure *content validity*, participants were asked questions about affect, behavior, and cognition to address the full range of the preparation experience. First, there was an assessment of overall interest in how participants felt while preparing for school. The purpose was to gain a general sense of their emotional valence during this period. Next, questions examined how participants typically behave when preparing for something specific (e.g., exam, presentation, etc.), or when they know they should be preparing for something specific and also, how their emotions influence this behavior. Questions became more finely tuned, by asking the participants when specifically they felt anxious, and whether they felt the subsequent behaviors were

compulsive or not. Additionally, questions focused on how often students would procrastinate and how long before their last exam they began studying. Finally, several questions addressed coping behaviors, including what kinds of behaviors participants engage in to control their negative emotions and how they force themselves to be disciplined when needed. Before being dismissed, participants were told they were free to add any additional information regarding their experience of preparing for academics in case it was not already covered in the span of the questions.

Items were developed based on each participant's focus group responses. For instance, based on the following focus group response:

> *"Honestly, I've noticed that when like I have an upcoming exam or like midterm season or finals, I get really irritated quickly with anything 'cause I know I should be doing something, and like sometimes my mom will try to call me and I'm like, 'Mom, I can't talk right now.' I have to force myself enough to do it already that like when other people or other aspects of life are coming at me, I'm just kind of like very irritated, frustrated, and annoyed, and I feel like my behavior kind of shows it because I kind of give attitude or like you know, I just want to be by myself."*

the items "I get irritated by small distractions" and "I feel like I have to force myself to do it" were developed. The generated items were then reviewed for duplication or similar questions. Items that were too similar were deleted. Several additional items that did not naturally evolve from the focus group responses were added such as, "I feel better in the

moment when I avoid my schoolwork." Items were intended to be clear, concise, and intelligible.

Scaling Format

A rating scale, which has been deemed appropriate for determining individual differences in the social sciences, was used for the PAS (Dawis, 1992). This choice was made based on the ubiquity of such formats in similar measures. Prior to completing the PAS, participants were given the prompt "When I have a test coming up, am working on a big project, need to get schoolwork done, etc…." Participants responded on a 5-point rating scale (1 = *strongly disagree*, 5 = *strongly agree*).

Content Validity

At this point, a content validity assessment was conducted. Several experts with knowledge of the related literature and underlying theory reviewed the scale. Experts were asked to assess how well they felt the items encompassed *preparation anxiety*. Additionally, they provided notes on any items that required further clarification or rewording and they assessed face validity. Items were retained if they clearly covered the construct and were comprehensible. In total, 66-items were generated (see Appendix B).

Participants

Participants included 258 undergraduate students in the Southern California area. Students were recruited from an Introductory Psychology course subject pool and were provided course credit for their participation. The sample was made up of 31% males, 68% females, and 1% who identified as other. Participants identified as African-American (2.8%), Asian/Asian-American (41.4%), Caucasian (9.6%), Latinx (33.5%),

Pacific Islander (0.4%), Middle Eastern/Indian (7.6%), or other (4.8%). The average age was 19.74 (*Min* = 18; *Max* = 31; *SD* = 1.78). The sample was made up predominantly of freshman (31.3%) and sophomore (31.7%) students (juniors 18.7%; seniors 17.9%; other 0.4%). Additionally, 23.3% of the participants were born outside of the US, while 62.2% of participants were born in the US, but their parents were not, and 14.5% indicated their families have been in the US for at least two generations.

Measures

The following measures were administered as a part of a larger questionnaire. Measures were chosen based on theoretical constructs that were hypothesized to potentially relate to *preparation anxiety*. Measures were administered in the order they are presented.

Self-Handicapping Scale

The Self-Handicapping Scale (SHS, Jones & Rhodewalt, 1982) is a 25-item questionnaire assessing an individual's propensity for engaging in self-handicapping behaviors ($\alpha = .74$). Questions are measured on a six-point rating scale from 1 (*strongly disagree*) to 6 (*strongly agree*) with higher scores representing higher levels of self-handicapping. Sample items include "I suppose I feel 'under the weather' more often than most people" and "I would do much better if I did not let my emotions get in the way."

Academic Self-Handicapping Scale

Self-handicapping was also measured using the Academic Self-Handicapping Scale since self-handicapping results tend to differ based on the measure used (ASHS, Midgley & Urdan, 1995; Schwinger et al., 2014). ASHS items were developed to fit with

the following three features: a) they must include a self-handicapping behavior, b) the reason for the behavior, and c) the behavior must be a priori (Schwinger et al., 2014). The scale consists of 6-items including, "Some students put off doing their schoolwork until the last minute so that if they don't do well on their work, they can say that is the reason. How true of this is you?" ($\alpha = .81$). Items are measured from 1 (*not at all*) to 5 (*extremely*).

Beck Depression Inventory-II

The Beck Depression Inventory (BDI, Beck et al., 1996) is a 21-item measure that evaluates the key components of depression such as mood, guilt, pessimism, and social withdrawal. Each item is measured on a scale from 0 to 3 with each number having a corresponding statement. For example: 0 (*I do not feel sad*), 1 (*I feel sad*), 2 (*I am sad all the time and I can't snap out of it*), and 3 (*I feel that the future is hopeless and that things cannot improve*). Higher scores indicate higher levels of depression ($\alpha = .92$).

State-Trait Anxiety Inventory

The State-Trait Anxiety Inventory (Spielberger et al., 1983) is a 40-item questionnaire assessing an individual's anxiety levels. The questionnaire measures both state and trait anxiety. For the purposes of the current study, only trait level anxiety items were included. Trait anxiety items include statements such as, "Some unimportant thought runs through my mind and it bothers me" ($\alpha = .93$). The questionnaire is measured on a 4-point scale from 1 (*almost never*) to 4 (*almost always)*.

Test of Self-Conscious Affect-3 short version

The Test of Self-Conscious Affect-3 short version (TOSCA-3 short version) is a scale measuring guilt and shame through different scenarios (Tagney et al., 1989). The test is meant to measure affective, behavioral, and cognitive factors related to shame and guilt. Participants are asked to imagine themselves in scenarios, and then rate how likely they are to react a specific way on a 5-point scale from 1 (*not likely*) to 5 (*very likely*). For example, participants are provided the scenario "you break something at work and then hide it" and then asked to rate from one to five how likely they are to have the following responses: a) "You would think, 'this is making me anxious. I need to either fix it or get someone else to do it.'" b) "You would think about quitting." c) "You would think 'a lot of things aren't made very well these days.'" The first response represents feelings of guilt, the second feelings of shame, and the third response indicates blame. The measure provides subscales for shame ($\alpha = .77$) and guilt ($\alpha = .68$).

Brief Fear of Negative Evaluation Scale

The Brief Fear of Negative Evaluation Scale (BFNE; Leary; 1983) is a 12-item scale designed to measure feelings of anxiety surrounding perceived negative evaluations and social anxiety (Leary, 1983). The Likert-type scale includes items such as "I am frequently afraid of other people noticing my shortcomings" with scores ranging from 1 (*not at all*) to 5 (*extremely*). Higher scores on the measure indicate more worry about others' opinions of them ($\alpha = .92$).

Rosenberg Self-Esteem Scale

Self-esteem was assessed using the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965), made up of 10-items. Items are measured on a rating scale from 1 (*strongly disagree*) to 4 (*strongly agree*). Sample items include "At times I think I am no good at all," and "I feel I do not have much to be proud of." Cronbach's alpha in the current sample was .90.

Sarason Test Anxiety Scale

The Sarason Test Anxiety Scale (STAS; Sarason, 1980) is a 37-item scale designed to measure feelings of test anxiety. Items include "During a test, I find myself thinking of the consequences of failing," and "I seem to defeat myself while working on important tests." Participants are to indicate whether each item is true or false for them. Items marked "true" are added together ($\alpha = .89$). Scores below 12 signify low test anxiety, 12-20 indicates mid-range, and scores above 20 indicate high test anxiety.

Big Five Personality Inventory

The Big Five Personality Inventory (BFI; John et al., 2008) is a 44-item personality inventory measuring five facets of personality (openness to experience ($\alpha = .74$), conscientiousness ($\alpha = .65$), extraversion ($\alpha = .86$), agreeableness ($\alpha = .63$), and neuroticism ($\alpha = .85$)). With the leading statement "I consider myself someone who…" items include "Gets nervous easily," and "Is full of energy" measured from 1 (*disagree strongly*) to 5 (*agree strongly*).

Irrational Procrastination Scale

The Irrational Procrastination Scale (IPS; Steel, 2010) measures an individual's tendency to irrationally delay intended activities. These behaviors are thought to be

irrational, as the person knows that they will be worse off because of their actions. The scale includes 9-items which measure procrastination on a 5-point rating scale from 1 (*not true of me*) to 5 (*often true of me*). Items include "I delay tasks beyond what is reasonable," and "At the end of the day, I know I could have spent my time better." Cronbach's alpha in the current sample was .86.

Pure Procrastination Scale

The Pure Procrastination Scale (PPS; Steel, 2010) is a 12-item scale measuring dysfunctional delay, or procrastination. Items are measured on a 5-point rating scale from 1 (*not at all*) to 5 (*extremely*). The scale includes items such as "I generally delay before starting on work I have to do." Higher scores indicate higher levels of procrastination (α = .93).

Intolerance of Uncertainty Scale

The Intolerance of Uncertainty Scale (Buhr & Dugas, 2002) contains 22 items designed to measure an individual's susceptibility towards feeling distressed by uncertainty (α = .94). Participants are asked to indicate responses from 1 (*not at all characteristic*) to 5 (*entirely characteristic*) as to how characteristic items are of them. Items include "Uncertainty makes me uneasy, anxious, or stressed," and "I must get away from all uncertain situations."

Self-Liking/Self-Competence Scale

The Self-Liking/Self-Competence Scale (SLCS-R, Tafarodi & Swann, 2001) measures two constructs related to self-esteem, self-liking and self-competence (α = .89). Sixteen-items are included using ratings from 1 (*strongly disagree*) to 5 (*strongly agree*).

Examples of items on the scale are “I tend to devalue myself” and “I sometimes deal poorly with challenges.” It includes subscales of self-liking (α = .91) and self-competence (α = .67).

Preparation Anxiety Items

Preparation anxiety items consisted of 66 items measured on a rating scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Items were developed to touch on all aspects of *preparation anxiety* (i.e., affective, behavioral, cognitive). Items included “I can’t get it out of my mind even when I’m away from it” and “I have a lot of trouble just getting started.” Cronbach’s alpha for the 66 items for this sample was .91.

Procedure

Participants were recruited using the Introductory Psychology Human Subjects Pool during Spring quarter and received course credit for their participation. Participants completed questionnaires online via Qualtrics survey software. Participants received a link through the SONA system and were able to take the questionnaire when it was most convenient for them. Most participants took around 40 minutes to complete all of the measures. Before beginning the survey, participants were presented with an informed consent page. They were informed that they were free to skip any questions or drop out of the study at any time. Additionally, they were informed that all information would remain confidential. After continuing to the next page and thus implying or indicating their consent, participants were presented with the above measures in the order they were presented. After completing the measures, participants provided demographic

information including their gender, ethnicity, and class standing. Finally, participants were debriefed about the purpose of the study.

One week later participants received a Qualtrics link to another survey. After receiving the link, participants had one additional week to complete the survey before the link expired. Participants could take it at any point during this time span. This survey contained the same 66 items that were administered the first time. This took participants several minutes to complete. Again, participants were informed of their rights and the study confidentiality. Participants then completed the items and were debriefed again.

Data Analytic Procedure

In order to answer the research questions, multiple statistical techniques were applied to the data. IBM SPSS Statistics version 27 was used to run the analyses. Specific results will be covered in the next chapter.

Data Cleaning

All items that were "negatively-worded" (worded in the opposite direction of the majority of other items) were reverse coded (i.e., on a 5-point scale, a score of 1 would now equal 5). Scale and subscale totals were calculated for all constructs of interest. Data were screened for missing answers. Participants who failed to complete a majority of the questionnaire were eliminated from future analyses. Descriptive statistics and frequencies were explored. Data were checked for normality.

Exploratory Factor Analysis

An exploratory factor analysis (EFA) was conducted to answer the research question: what is the underlying factor structure of the Preparation Anxiety Scale (PAS)?

EFA is an exploratory, multivariate approach to both data reduction and to uncovering the underlying dimensions of a scale (Hayton et al., 2004). It was first used by Spearman (1904) and has since become an invaluable aid in developing and validating instruments and providing insights into factor structure (Watkins, 2018). Factor analysis attempts to find the most parsimonious factors or constructs to explain covariance in the data (Tucker & MacCullum, 1997). EFA is particularly useful for scale development, especially when there is no particular a priori theory on the number of latent constructs predicted (Hurley, et al., 1997). It can help to forward theory development and provide more meaning. This technique assumes the presence of latent variables or constructs that cannot be directly measured; instead, we use the measured variables as indications of these constructs (Watkins, 2018). These latent constructs can be thought of as hypothetical constructs, used to more deeply understand an observation (Tucker & MacCullum, 1997). For example, an intelligence test may be comprised of multiple different constructs (e.g., working memory, quantitative reasoning, knowledge). By being able to look at each factor, we are better able to understand what a given score on the measure actually means.

Key Terms. There are several important key terms to consider when discussing EFA. Again, *latent variables* and *constructs* are those that are not directly measured, but instead are inferred from directly observed variables (Tucker & MacCullum, 1997). When referring to *factors*, this is referring to the *latent constructs*. Since EFA tries to explain variance through the influence of underlying factors, it is important to have some measure of this phenomenon. *Eigenvalues* provide a measure of the amount of variance

in the observed variables that can be explained by each factor, and they can be converted into a percentage of the variance explained by dividing the eigenvalue by the total variance (Watkins, 2018). Items are also said to "load" onto certain factors. These *factor loadings* measure how much any given item is related to the factor (Watkins, 2018). Finally, *communalities* represent the amount of the variance in each specific observed variable that can be accounted for by the factors. *Communalities* with values closer to one mean more of that item's variance is due to the extracted factors (Hogarty et al., 2005).

Sample Size in EFA. There are many different considerations that need to be examined when conducting EFA, but one of the first and most important decisions to make is what sample size to use. In fact, Worthington and Whittaker (2006) argue that it is critical to choose a sample size prior to beginning data collection. An adequate sample size is a requirement of EFA for two reasons. First, if there are too few participants per variable, covariance patterns may be unstable since the correlations are more subject to chance. Second, the sample may not be as representative a sample of the population as was intended (Worthington & Whittaker, 2006).

What constitutes an "adequate" sample size differs from researcher to researcher. Some take a ratio approach, looking at the number of participants against the number of variables in the measure. While there is disagreement on the exact ratio recommended, it is generally accepted that there should be around 5-10 participants per item in order to reliably conduct an exploratory factor analysis (e.g., Gorsuch, 1983). Others opt for a more absolute approach where they state a general minimum number of participants but again, this rule of thumb changes based upon researcher. A content analysis conducted on

scale development articles in *The Journal of Counseling Psychology* over a 10-year-span (1995-2004) found that absolute sample sizes ranged from 84 to 411, while ratios ranged from 2:1 to 35:1 participants to factors (Worthington & Whittaker, 2006). Another set of guidelines, put forth by Comrey and Lee (2013), rates a sample size in the 50s as very poor, in the 100s as poor, in the 200s as fair, in the 300s as good, in the 500s as very good, and finally, in the 1000s as excellent. Others have provided evidence that anything fewer than three participants per item is unacceptable for EFA (Velicer & Fava, 1998). As evidenced by these assorted guidelines, certain sample sizes may be adequate, but generally a larger sample size is preferable since it produces more stable correlations and thus, is more replicable in future exploratory factor analyses (Worthington & Whittaker, 2006).

More recently, researchers have argued that there should be no set a priori rules regarding sample size in EFA, as it is not until after the analysis has been conducted that we know whether the sample size was adequate or not (Cabrera-Nguyen, 2010; Henson & Roberts, 2006). Instead, certain features of the data must be assessed for adequacy, such as communality strength, factor loadings, number of factors, and items per factor after the fact (de Winter et al., 2009). For instance, when communalities are high ($\geq$0.6) and several items load onto each factor; sample size can actually be relatively small compared to some of the rules previously put forth (MacCallum et al., 1999). Worthington and Whittaker (2006) recommend the following four guidelines when choosing sample size: 1) a sample size of at least 300 will typically suffice, 2) a sample size of 150 to 200 can be acceptable given that the data includes communalities above .50

or has 10:1 items per factor with factor loadings around .40, 3) an even smaller sample size may be adequate if all communalities are above .60 or if at least 4:1 items per factor have factor loadings above .60, and 4) a sample size under 100 with fewer than 3:1 participants per item is not considered acceptable. Based on these recommendations regarding sample size, no a priori minimum was set. Instead, the most participants possible were obtained and data were checked for suitability to EFA after collection.

Assumptions. EFA often relies more on adhering to conceptual assumptions more so than statistical ones (Hair et al., 2010a). One of the first assumptions is that the variables are measured continuously or conceptualized as continuous variables. The second assumption is linearity (Watkins, 2018). However, it has been purported that this is only important because it could have an effect on the Pearson product-moment correlation (*r*) between the variables. These correlations are used to compute the results of EFA, so any error could potentially lead to spurious findings (Watkins, 2018). Looking at scatterplots can assess linearity. In the case of non-linearity, it may be more appropriate to use a more "robust" correlation coefficient than *r* (de Winter et al., 2016; Watkins, 2018).

Because normality is one of the assumptions of the Pearson correlation, it is imperative to check the data for normality (Goodwin & Leech, 2006). Skewness and kurtosis can have a large impact on Pearson correlations and thus must be assessed prior to analyses. Skew provides a measure of the symmetry of the distribution, so it is shows if participants predominantly responded in one direction. Kurtosis provides a measure for how "flat" the data are. One way to cut down on any impact from skew is to make sure

that all items are re-coded to be scored in the same direction, thus, high scores on any given variable should indicate the same thing (Watkins, 2018). Recommendations for acceptable levels of skew and kurtosis differ. Some of the stricter guidelines indicate that anything ≤1 is considered acceptable. More generally, it is accepted that skewness and kurtosis ≤2 are considered acceptable (Hair et al., 2010b; Ryu, 2011). Even further, simulation studies have found that univariate skewness ≤ 2 and kurtosis ≤ 7 should be nonproblematic (Curran et al., 1996). In addition to checking for skewness and kurtosis, outliers should be assessed, as these outliers would skew the Pearson correlation potentially obfuscating findings (Watkins, 2018). The current data were checked for normality. Skewness and kurtosis ≤ 2 were considered as acceptable (Hair et al., 2010b; Ryu, 2011).

Factorability. Once the above considerations have been determined, the factorability of the data should be assessed. EFA is only an appropriate strategy when the items are intercorrelated with one another. It has been suggested by a variety of researchers that inter-item correlations, or at least a majority of them, should exceed .30 (Hair et al., 2010a; Tabachnick & Fidell, 2007; Watkins, 2018). A more objective test of factorability is Bartlett's (1950) test of sphericity, which "estimates the probability that correlations in a matrix are zero" (Worthington & Whittaker, 2006, p. 818). However, this test is prone to influence from large sample sizes and can show significance even with small correlations if the sample size is large enough (Tabachnick & Fidell, 2007). Because of this, it is recommended that this test be used in instances where the participant to item ratio is less than 5:1 (Worthington & Whittaker, 2006). To supplement Bartlett's

(1950) test, the Kaiser-Meyer-Olkin (KMO, Kaiser, 1970) measure can be used (Watkins, 2018). This measure "accounts for the relationship of partial correlations to the sum of squared correlations," meaning that it indicates the degree to which the correlation contains factors or just chance correlations (Worthington & Whittaker, 2006, p. 818). Generally, the goal is a KMO value of at least .60, but a value of $\geq .70$ is even better (Tabachnick & Fidell, 2007; Watkins, 2018; Worthington & Whittaker, 2006).

Extraction Methods. The term EFA is often used to refer to both principal components analysis (PCA) and common-factor analysis (FA). However, there are notable differences between the two – mainly, the purpose they serve. PCA intends to reduce the number of items while still maintaining the variance, where FA is more concerned with making sense of the latent factors that make up the shared variance among the items, thus making it more suitable for the purposes of scale development (Worthington & Whittaker, 2006). According to Brown et al. (2011), PCA acts more as a means of simplifying and describing data, while FA goes deeper than the observed variables to determine the latent structure. Research has found that both techniques often lead to similar outcomes (e.g., Velicer & Jackson, 1990), but FA has been shown to be preferable to PCA in a number of circumstances, like when the researcher is concerned with latent factors (Gorsuch, 1990; Widaman, 1993). Additionally, FA results tend to generalize more to confirmatory factor analysis (CFA), a technique used to verify factor structure in which researchers can specify the number of factors, and they can establish which measured variables correspond with which latent variable, than PCA results do (Floyd & Widaman, 1995). Thus, Worthington and Whittaker (2006) recommend using

FA over PCA in the case of new scale development. Based on these recommendations, FA was chosen for the current study.

Estimation Method. After common factor analysis (FA) has been chosen, a researcher must specify the estimation method, such as principal axis factoring (PAF) or maximum likelihood factoring (ML), two of the most popular FA estimation types. The two differ in the ways they mathematically manipulate the correlation matrix. PAF is a least-squares estimate that does not make any assumptions about the type of error in the model. ML, on the other hand, assumes that all error is sampling error and makes adjustments to the correlation matrix after each iteration, weighting correlations with less unique variance more (de Winter & Dodou, 2012; Youngblut, 1993). Because PAF weights all residuals equally, it leads to more stable factor loadings than ML and makes it preferable when trying to identify a simple pattern (equal loadings, few cross-loadings) according to de Winter and Dodou (2012). Also, because ML assigns less weight to weaker correlations, it does not recover weaker factors as easily as PAF (de Winter & Dodou, 2012). ML, which stems from normal distribution theory, is considered a good option when data is normally distributed because it allows for the use of fit indices and for significance testing of the factor loadings and correlations among factors (de Winter & Dodou, 2012; Fabrigar et al., 1999). However, PAF is the preferred method in instances where "the relationship between measured variables and factors are relatively weak (≤ .40), sample size is relatively small (≤ 300), multivariate normality is violated, or when the number of factors underlying the measured variables is misspecified" (Watkins, 2018, p. 229). Finally, PAF is more forgiving if there happen to be any violations of

normality (Costello & Osborne, 2005). PAF was chosen over ML because the current study had a relatively small sample size, it provided more leeway if the data were not perfectly normal, and provided more stable factor loadings.

Factor Retention. One of the most crucial considerations in factor analysis is how many factors to retain. In fact, Hayton et al. (2004) state that because other decisions (e.g., choice of method, rotation method) have been found to be quite robust, this is arguably the most important decision in factor analysis. The goal is to retain the fewest factors that still represent the underlying correlations, providing parsimony with adequate explanation (Hayton et al., 2004). Specifying either too few or too many factors can cause errors effecting results, but it is typically considered to be more problematic to specify too few factors. Both errors can lead to problems in replicating results (Velicer et al., 2000). By specifying too few factors, there is the risk of losing out on valuable information. Also, there is a risk of falsely loading items onto factors incorrectly, items that should actually load onto factors not included in the model, instead loading them onto factors they should not load onto (Hayton et al., 2004). Specifying too many factors can lead researchers to focus on minor differences rather than paying more attention to major ones. It also can lead to factors with only one high loading variable that are tough to interpret (Zwick & Velicer, 1986).

Multiple criteria have been suggested for deciding how many factors to retain, and researchers should be aware of all of these guidelines. Perhaps one of the most commonly used criterion for the number of factors to retain is the Kaiser-Guttman criterion (Guttman, 1954; Kaiser, 1958), which states that factors with eigenvalues

greater than one should be retained. This is often the default with many statistical programs, but specialists argue this tends to be wrong and should not be used as a strict criterion, but rather as just one of the aspects that is looked at when deciding the number of factors to retain (Watkins, 2018). Another commonly used method that also makes use of eigenvalues is Cattell's (1966) scree plot. This provides a helpful visual element to factor retention by allowing a researcher to view the descending eigenvalues to identify a drop-off where values tend to level off horizontally (Worthington & Whittaker, 2006). This point is known as the "elbow" and anything above this point is thought to be a valid factor. While these may be helpful techniques in understanding factor retention, they tend to retain too many non-interpretable factors (Hayton et al., 2004; Henson & Roberts, 2006). Therefore, while these are observed in the current study, additional methods are used as well to determine factor retention.

Parallel Analysis. One of the selection methods that has been found to be the most consistent is Horn's (1965) parallel analysis method (Finch, 2020). Therefore, parallel analysis was used in conjunction with the above methods to determine the number of factors to retain. This method attempts to overcome the limitation of other methods where, with a finite sample, sampling error and least-squares bias can lead to earlier eigenvalues being greater than one and later ones being less than one (Hayton et al., 2004). This means that some of these values may be higher than one simply due to error. Parallel analysis is able to adjust for this sampling error. The theory here is that actual factors underlying real data should have larger eigenvalues than parallel components that are calculated from random data with the same number of cases and

variables. Therefore, when conducting parallel analysis, correlation matrices are constructed based on random data with the same number of variables and same sample size. Typically, thousands of these will be constructed. These are then used to create distributions of eigenvalues that would be expected if no underlying factor structure were present (Finch, 2020). The eigenvalues that are calculated from the actual data are then compared with the 95th percentile of the distribution of null factor eigenvalues. Factors are retained if their eigenvalue from the real data is larger than the corresponding 95th percentile null eigenvalue (Finch, 2020; Hayton et al., 2004). Findings have consistently shown that parallel analysis, when compared to other methods (e.g., eigenvalue ≥ 1 rule, scree plot), is more often able to identify the correct number of factors underlying a set of observed variables (Fabrigar & Wegener, 2012; Finch, 2020; Green et al., 2015).

Rotation Method. Finally, once it has been decided how many factors to retain, it must be decided how they should be rotated. EFA models with more than one factor do not actually have a unique solution; instead, researchers need to choose a single solution from a set of infinite solutions (Fabrigar et al., 1999). Thurstone (1947) proposed that for any set of equivalent solutions, one should choose the solution with the most "simple structure" and proposed that factors be rotated in multidimensional space to find this simple structure (Fabrigar, et al., 1999). Rotations can be of one of two kinds: orthogonal or oblique. Both theory and data can influence the type of rotation that is chosen. Orthogonal rotations (e.g., varimax) constrain the factors so they are not able to correlate with one another. Oblique rotations (e.g., direct oblimin, promax) are typically used when the variables are known or assumed to be correlated with one another, but they do not

necessarily have to be correlated (Worthington & Whittaker, 2006). As almost everything in social science is correlated to some degree, most researchers recommend using oblique rotation to allow factors to correlate (Brown et al., 2015, Fabrigar et al., 1999; Gorsuch, 1983; Watkins, 2018). If the factors are truly not related, then oblique rotations will produce orthogonal results (Watkins, 2018). It is said that in social science, oblique rotations lead to more realistic interpretations and provide information that is missing from orthogonal rotations. Therefore, promax and direct oblimin rotations are recommended, especially as they will lead to similar results if factors are unrelated (Gorsuch, 1983; Pett et al., 2003; Watkins, 2018). Others argue that orthogonal solutions are better because the rotation is more parsimonious and more likely to be replicated (Henson & Roberts, 2006). Some researchers recommend beginning with an oblique rotation and assessing factor intercorrelations before deciding on a final solution (Henson & Roberts, 2006; Worthington & Whittaker, 2006). Both types of rotation were utilized in the current study.

Oblique and orthogonal rotations also differ in how the loadings are interpreted. Orthogonal rotations produce factor loadings that are the same as the correlation between common factors and measured variables. Oblique rotations, on the other hand, produce two types of factor loadings: structure and pattern coefficients (Walker, 2018). The structure coefficients can be interpreted the same as the correlation between the common factors and the measured variables, whereas the pattern coefficients become correlations between common factors and measured variables after all the other common factors have been partialed out (Walker, 2018). For the most part, researchers are in agreement that

pattern coefficients should be interpreted prior to structure coefficients (Fabrigar & Wegener, 2012; Hair et al., 2010a).

Correlational Analyses

Correlational analyses were used to establish convergent and discriminant validity by investigating the relationship among the PAS and other related constructs (e.g., test anxiety, trait anxiety) and unrelated constructs (e.g., agreeableness). Correlations were also used to evaluate test-retest reliability over time. Further exploratory analyses were conducted using correlations to explore the relationship between the PAS and other constructs of interest.

Results

The purpose of this study was to develop a measure of *preparation anxiety* and identify its underlying factor structure. Another main goal of this study was to look at the relationship between *preparation anxiety* and other variables (e.g., trait anxiety, procrastination). The following chapter presents the exploratory factor analysis results and the rationale behind the choices made during the process. Additionally, it provides results regarding the relationship between *preparation anxiety* and other constructs. All analyses were done using IBM SPSS Statistics version 27.

Data Cleaning and Screening

Data were first scanned for missingness. Six participants had failed to complete the questionnaire and were discarded from all analyses ($N = 252$). The percentage of missing values for variables of interest ranged from 0-1.6%. Several different guidelines have been put forth regarding what percentage of missing values is deemed acceptable; Peng et al. (2006) advise a cutoff of 20%, Bennett (2001) advises 10%, and Schafer (1999) 5%. The current data fell well within these three guidelines.

Little's (1988) Missing Completely At Random (MCAR) test was done to test the assumption that missing values are missing at random and are not following a significant pattern. The MCAR test revealed that the missing values were, in fact, random (χ^2 (33614) = 2174.59, $p = 1.0$). In the case that the data are MCAR, the most simple techniques for dealing with the missing values will not bias the results (Donders et al, 2006). Therefore, any imputation method should be adequate. For ease, mean imputation

was used to handle the missing values; that is, the mean value for each variable replaced the missing values.

Descriptive Statistics

All items that needed to be reverse coded were reverse coded. Depending on the measure, each participant's responses were either totaled or averaged to create an appropriate measure of the construct. Higher scores indicated a larger magnitude of endorsement for that construct. Subscale scores were also calculated. Frequencies and descriptive statistics (mean, standard deviation, median, kurtosis, skew) were checked for any outliers or odd values. Table 1 shows descriptive statistics for each scale and subscale. Histograms, box plots, and QQ plots were also considered (Field, 2013). No abnormal values were identified.

Normality is important in EFA, but only because deviations can affect the Pearson product-moment correlation among the variables used in EFA, which can pollute findings (Watkins, 2018). For this reason, special attention was paid to the 66 preparation anxiety items. All items fit the guidelines proposed by Hair et al. (2010a) that state that data can be considered normal if skewness is between ± 2 and if kurtosis is between ± 7. Descriptive statistics for the original preparation anxiety items are provided in Table 2.

Results indicate that students are making use of strategies believed to be related to *preparation anxiety*. For instance, participants reported both self-handicapping (M = 3.51) and procrastinating (M = 3.02) above the scale midpoint. Scores on the Self-Handicapping Scale indicated that students are using these strategies often (M = 3.51), while scores on the Academic Self-Handicapping Scale indicated such strategies are

rarely used (M = 1.83). This is unsurprising given that a meta-analysis on self-handicapping research found that the scale used has a significant effect on results (Schwinger et al., 2014). Participants also indicated that they experience *preparation anxiety* (M = 3.29).

Exploratory Factor Analysis

An exploratory factor analysis was conducted for two reasons. The first reason was to cut items that do not fit with the others and find a shorter, more parsimonious solution to the scale, and the second was to ascertain a factor structure for the preparation anxiety scale.

Factorability

Not all data items lend themselves well to EFA, so several assumptions were checked prior to beginning the actual EFA process. Therefore, this section details the steps that were taken to ensure that EFA was an appropriate approach.

First, it is important that the data actually correlate with each other. If the items are uncorrelated then there is no presence of a factor structure, as there is nothing to be grouped together. Data were checked to see that items correlated well with one another. Items that did not correlate at least .30 with one or more other items were deleted from the item pool as has been suggested in previous research (Tabachnick & Fidell, 2007). Six items were deleted for this reason.

While it is crucial that substantial correlations exist in the data, it is also important that these correlations are not too strong which would indicate multicollinearity in the data. This means that the items would be too closely related for any factors to emerge.

The correlation matrix was inspected again, this time for items correlating at or above .80. No items were deleted for this reason. Furthermore, assessing Variance Inflation Factor (VIF) and Tolerance tests checked multicollinearity. It has been suggested that VIF's above ten and Tolerance scores below .10 indicate high multicollinearity. VIF's (*range:* 1.6-5.3) and Tolerance scores (*range:* .19-.62) in the current data implied that there was no multicollinearity (Allison, 1999).

Next, an internal consistency reliability analysis was conducted to check whether this was an internally reliable measure, Cronbach's alpha indicated the set of 60 items were reliable ($\alpha = .91$). Results showed that deleting any single item from the scale would not result in a substantial increase in reliability.

As discussed in the previous section, sample size is a major consideration when conducting EFA. Not having an adequate sample size could potentially result in unstable covariance patterns, affecting the factor structure results (DeVellis, 2003). While guidelines have been set forth by many different researchers (e.g., Worthington & Whittaker, 2006), others argue that we can only tell whether a sample size is adequate after the data is already collected by looking at other properties of the data (Cabrera-Ngyuen, 2010; Henson & Roberts, 2006). One way to test for sampling adequacy is Bartlett's (1950) test of sphericity. which compares the observed correlation matrix to the identity matrix (Watkins, 2018). This test indicated that the sample size was large enough for the data to be factorable ($\chi^2(2145) = 8198.36$, $p < .001$). Another measure of sampling adequacy is the Kaiser-Meyer-Olkin (KMO, Kaiser, 1970) test, which says that a sample is adequate if the value is greater than .60 (Tabachnick & Fidell, 2007; Watkins,

2018; Worthington & Whittaker, 2006). The current sample produced a KMO of .88. The data appeared to be suitable for EFA based on the above results.

Unrotated Solution

As discussed in the previous section, FA was chosen over PCA as the method of extraction. The main difference between the two has to do with how they deal with variance. PCA assumes that the total variance can be explained by the factors and does not include error variance, whereas FA recognizes the existence of both shared and unique variance (Osborne, 2015). Because FA recognizes the uniqueness of each item, and PCA does not, FA was a more reasonable choice. In SPSS, FA is referred to as principal axis factoring (PAF), therefore, FA and PAF are used interchangeably.

Item Reduction. An initial PAF was conducted on the 60 remaining items. The main goals of this unrotated factor solution were a) to determine how many factors to extract, and b) to reduce the number of items included in the scale. Before being able to determine the number of factors to extract, it is necessary to eliminate items that are not providing unique value to the scale; therefore, the initial focus was on item reduction.

Initially, principal axis factoring identified a 14-factor solution that explained 65.46% of the variance based on the Kaiser-Guttman criterion that states that eigenvalues should be retained if they are greater than one, the default setting for SPSS. Factor loadings for these 14 factors were assessed. Tabachnick and Fidell (2007) have recommended that factor loadings below .32 should be ignored. Sample size can affect what is and is not considered to be good factor loading. One set of guidelines found that to reach significance at the .01 level, factor loadings need to be greater than .512 for a

sample size of 100, .364 for a sample of 200, and .298 for a sample larger than 300 (Stevens, 2012). Based on these suggestions, items below .40 were discarded. Eight items failed to load at least .40 on any of the 14 factors. These items were removed, and the PAF was conducted again. This time 11 factors were identified that explained 63.82% of the variance. One item was deleted for failing to load at least .40 on any of the factors. The same process was repeated for another iteration. Once again, a single item was deleted because it no longer loaded on any of the factors. This process was completed until every item loaded at least .40 on one of the factors, leaving a nine-factor solution for 49 items that explained 61.43% of the variance.

Researchers have also recommended rejecting items with low communalities, which would suggest that they do not have much in common with the other variables and do not easily map on to one of the factors (Child, 2006; Yong & Pearce, 2013). Communalities can be low for several reasons, such as low reliability or not really being related to the construct of interest. Therefore, in both cases, these are items that should not be retained. For the purpose of dimension reduction, Child (2006) recommends removing items with communality scores below .20. Others suggest a cut-off of .40 (Osborne et al., 2008). For the purposes of the current study, the more stringent guideline of .40 was used. Five items were removed for having communality values below .40. Principal axis factoring was done on the remaining 55 items, revealing four more items that were to be removed because of their low communality. Items with low communalities were deleted until there were 38 remaining items (see Table 3).

Factor Retention. Once the items were somewhat reduced, the process of determining factor structure began. This is arguably the most important decision in EFA (Child, 2006; Fabrigar & Wegener, 2012; Gorsuch, 1983; Walker, 2018). Determining how many factors to retain is not a cut-and-dried science. Like many decisions in EFA, factor retention depends on the circumstances as well as which, or whose, guidelines you follow. Several methods were used to determine the number of factors present in the PAS (e.g., eigenvalues, scree plot, parallel analysis).

The general "rule of thumb" when it comes to factor retention is the Kaiser-Guttman criterion, which says to retain any factor with an eigenvalue greater than one. This means that the factor explains more of the variance than a single observed variable. Factors with low eigenvalues indicate that there is little common variance between that factor and the other factors and should be eliminated (Howard, 2016). The Kaiser-Guttman criterion, may be the most famous criteria, but it is also typically wrong, and it produces more factors than should actually be retained according to many researchers (Fabrigar & Wegener, 2012; Henson & Roberts, 2006; Walker, 2018).

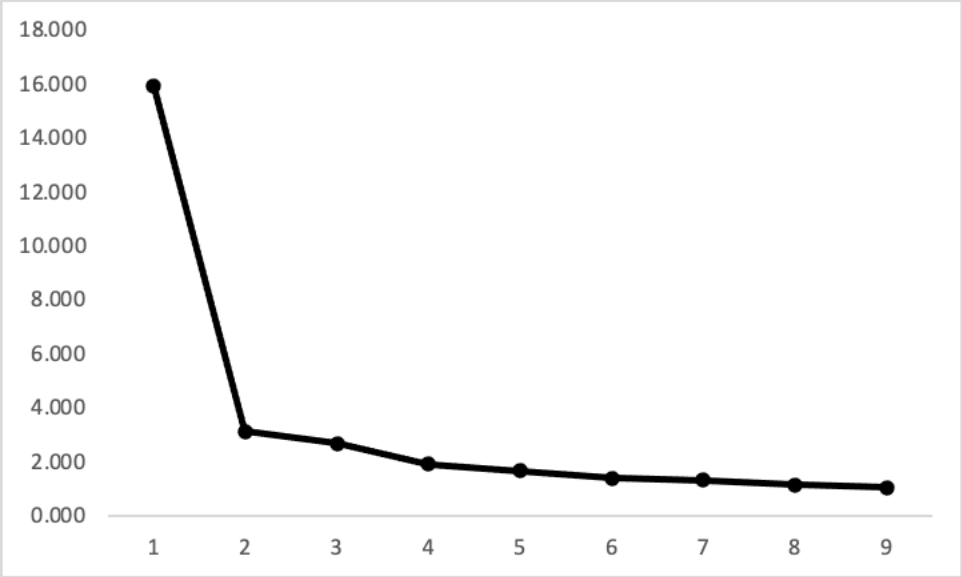
A PAF was carried out on the remaining 38 items, after removing items with low factor loadings. Because the SPSS default is to extract factors with an eigenvalue greater than one, this is the first criterion that was used. Seven factors explaining 63.22% of the variance were extracted based on this solution. The first factor accounted for over half of that variance (36.78%) with factors two and three accounting for more than 5% of the variance each. Though there was no specific hypothesis in regard to how many underlying factors would be present, seven factors seemed implausible given the context

of similar measures. It is likely that there are not actually seven factors present, as only the first four factors had items loading above .40.

Scree plots provide an additional visual interpretation of the results by plotting the eigenvalues. Typically, it is easy to identify a visual drop-off point where the plot starts to level off horizontally. Anything above this "elbow" is considered to be a factor worth retaining, while anything below it is thought to not be a meaningful factor (Worthington & Whittaker, 2006). The scree plot for the current PAF indicated that a one-factor solution might be best, as seen in Figure 1. While one factor does explain much of the variance, the scree plot also implies the potential for a second possible solution, as the scree plot contains one major drop off point and a second, smaller one hinting at a three-factor solution.

Figure 1

Scree Plot

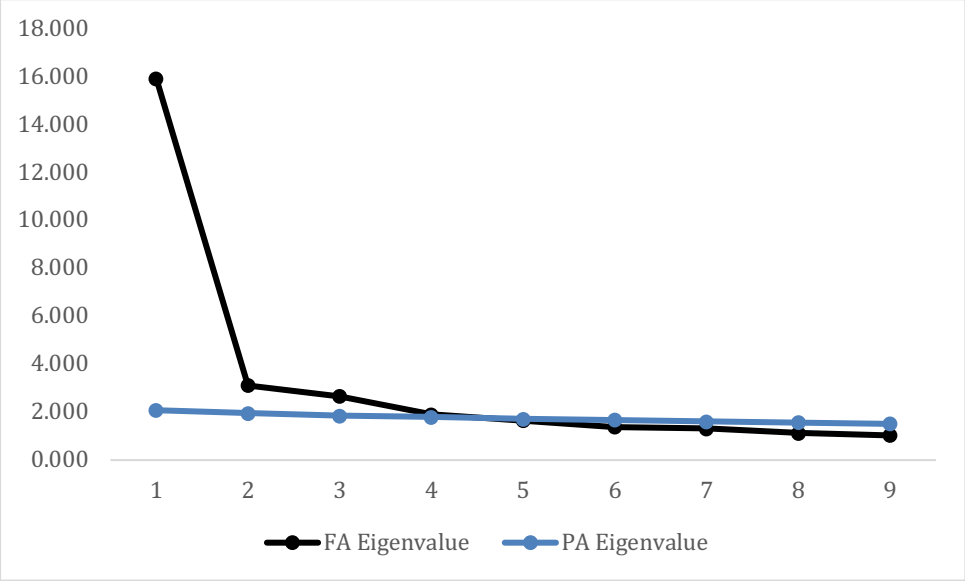


Theoretically, both a one-factor and a three-factor solution make possible sense, so further investigation needed to be done. Simulation studies have found that parallel analysis is one of the most accurate estimates of factor retention (Velicer et al., 2000; Velicer & Fava, 1998). Parallel analysis compares eigenvalues from the observed data with eigenvalues that would be found in data with the same properties (e.g., number of cases, variables) if there were no underlying factor structure. Therefore, only factors with an eigenvalue greater than the corresponding null eigenvalue are retained. O'Connor's (2000) SPSS syntax was used to conduct a parallel analysis with 100 simulated data sets. The 95th percentile of the null eigenvector computed from the simulated data were

compared to the observed eigenvectors. This parallel analysis favored a three-factor solution as demonstrated by the fact that the observed values were higher than the null values up until the fourth eigenvalue. The first observed eigenvalue was 13.98, while the first "null eigenvalue" was 1.92. The second observed eigenvalue was 2.81, while the corresponding "null eigenvalue" was 1.79. The third observed eigenvalue was 2.41, with an eigenvalue of 1.71 for the "null". Finally, with the fourth eigenvalues the "null" exceeded the observed value with the observed eigenvalue being 1.49 and the "null" being 1.63 (see Table 4).

Figure 2

Comparison of Factor Analysis (FA) Eigenvalues and Parallel Analysis (PA) Eigenvalues



Rotated Solution

At this point, a decision was made on what type of rotation to use. Factor rotation helps to increase interpretability by rotating the factors on the factor axes to bring them closer to the variables, which are fixed in space (Walker, 2018). This describes an oblique rotation. Orthogonal rotation makes factors even more distinct by allowing each axis to rotate independent of the other axis. As recommended, an oblique rotation was tried first to test the factor intercorrelations (Henson & Roberts, 2006; Worthington & Whittaker, 2006). There is very little literature regarding which type of rotation to choose beyond the basic choice of oblique versus orthogonal. Perhaps this is because results tend to be similar as long as the factor structure is clear. Gorsuch (1983) recommends using either varimax (orthogonal) or promax (oblique) rotation. Factor intercorrelations indicated that the factors were indeed correlated, as they typically are in the social sciences. For this reason, promax rotation was chosen.

Three Factor. A three-factor solution was tested using promax rotation. Five items were removed for possessing communalities below .40 (Osborne et al., 2008). One additional item was removed because it no longer loaded on any of the factors at a value of .40. This left a 32-item solution that explained 53.12% of the variance (see Table 5). Factor one had an eigenvalue of 12.33 and accounted for 38.53% of the variance, factor two had an eigenvalue of 2.62 and accounted for 8.18% of the variance, and factor three had an eigenvalue of 2.05 accounting for 6.41% of the variance. Factor intercorrelations ranged from .59 to .64 (see Table 10). Overall, the solution provided a reliable scale (α = .95). Factors were also reliable (factor one: α = .92; factor two: α = .89; factor three: α =

.87). Moreover, the factors appeared to make theoretical sense with each other at face value. Table 6 shows factor loadings for the three factors.

According to Kim and Mueller (1978), it does not make a significant difference whether the factors are correlated or not in the exploratory phase of a study. In fact, they say that it may even be favorable to choose an orthogonal technique simply because it often provides a more succinct, clear picture of the factor structure. Others agree that, though not technically correct, so long as a similar factor structure is emerging, the specific type of rotation used does not particularly matter (e.g., Gorsuch, 1983).

A three-factor solution was also tried with varimax rotation on the 38 items from the unrotated solution. Initially, this explained 49.81% of the variance. Seven items were removed due to low communalities and one item was removed for failing to load properly. Three items were removed for no longer loading on any of the factors. The PAF was performed again on the remaining 27 items. This time the three factors explained 57.60% of the variance (factor 1: 42.45%; factor 2: 8.13%; factor 3: 7.02%). There were quite a few cross-loading items, or items that loaded onto more than one factor. This indicates that an oblique technique may be preferable for this data, as the factors seem to be conceptually similar. One way to deal with cross-loadings is to remove these items. Different researchers propose different cut-off points for removing cross-loaded items. One proposition is that a good cross-loading factor cut-off is a maximum of 75% of any factor loading. Based on this criterion five more items were eliminated. Another PAF revealed three factors now explained 59.16% of the variance of the remaining 22 items (see Table 5). The first factor explained 42.24% of the variance and factors two and three

explained 9.88% and 7.04%, respectively. The resulting scale was slightly less reliable than the prior solution (α = .93). The same can be said for the factor reliability (factor one: α = .90; factor two: α = .85; factor three: α = .87). Factor loadings are presented in Table 7.

Four Factor. Parallel analysis results were close for the fourth factor – the FA eigenvalue matched closely with the PA eigenvalue. A four-factor solution was tested because of this, just to ensure there was not a fourth variable of importance. PAF with promax rotation was performed since oblique rotations are favored in an initial run. Items with low communalities were removed, leaving a 28-item solution. This accounted for 60.48% of the variance, with the first factor accounting for a majority with 40.87% (see Table 5). The second and third factors respectively accounted for 7.54% and 6.95% of the variance. The fourth factor made up 5.12% of the variance. The number of items loading on each factor remained reasonably consistent, excluding the fourth factor, which had much fewer items loading on it with only three items loading above .40. It has been suggested that factors should only be retained if they contain four or more items with loadings of at least .40 (MacCallum et al., 1999). Even more specifically, in order for a factor to be considered stable, it needs to have at least four loadings greater than .60 when the sample size is 50 or ten loadings of at least .40 when the sample size is greater than 150 (Guadagnoli & Velicer, 1988). This was not the case with the four-factor solution, indicating it was not the optimal choice. Therefore, no further analyses were done with four factors.

Single Factor. The scree plot makes it glaringly obvious that a single factor may present the best results. Therefore, this option was explored. Again, PAF was run on the unrotated 38 items. Items not loading at least .40 or that cross-loaded highly with the first factor were removed. Next, items presenting with low communalities in each iteration were eliminated until all communalities were above .40. This process was continued until only 22 items remained. An additional two items were removed due to loading onto factors other than the initial single factor. Another PAF was performed. A more liberal approach to communalities was taken this time, removing any items with communalities below .30. Seventeen items comprised the final single solution accounting for 50.28% of the variance in the data (see Table 5). The single factor scale had a Cronbach's alpha of .94 with factor loadings ranging from .60 to .78 (see Table 8).

Final Solution. The best fit for the data is considered the one with the "cleanest" factor structure. This means it contains item loadings above .30, few cross-loadings, and no factors with fewer than three items (Costello & Osborne, 2005). A single factor solution may be the simplest, but it would only permit analyses on *preparation anxiety* as a whole. It would not allow for breaking down and understanding the components of *preparation anxiety*, which was the intention of this study.

With the single-factor solution rejected, the main decision was the type of rotation to utilize. Once again, oblique rotations (e.g., promax) allow for the factors to correlate with one another, while orthogonal (e.g., varimax) rotations do not. In this case, both solutions were quite similar. In fact, the promax solution contains all but one of the items contained in the varimax solution. This may make it appear as though the varimax

rotation is the simpler of the solutions, being a shorter version of the promax solution that explains even more of the variance.

However, Fabrigar et al. (1999) advise against succumbing to the temptation to conduct a varimax rotation to uncover "conceptually distinct" factors, especially if this is done to "clean up" or try to provide further interpretability to the factors. This intuition goes directly against what the methodological literature indicates. Fabrigar et al. (1999) demonstrate how a varimax and direct oblimin (oblique, or promax) rotation compare. Upon first consideration, the orthogonal rotation has fewer cross-loadings, but when including unsuppressed cross-loadings ($\leq .40$), it becomes clear that those cross-loadings are higher than they are in the case of oblique rotation. In Fabrigar et al.'s (1999) data, 44.4% of the cross-loadings in the varimax solution were above .20, while only 13.9% had values greater than that in the direct oblimin solution. This indicates that the oblique rotation is actually "cleaner" in this case. Moreover, only conducting varimax rotation removes any information about the existing correlations between the factors, leading to the belief that they are unrelated. Like the data in the Fabrigar et al. (1999) article, the current data also showed that the magnitude of cross-loadings was higher in the case of varimax rotation than promax rotation. Therefore, for the final analysis, *PAF was performed with promax rotation on three factors* (see Table 6).

Preparation Anxiety Scale Descriptive Statistics

Scores ranged on the final Preparation Anxiety Scale (PAS) from 1.41 to 4.94 (M = 3.58, SD = 0.69). The mean for factor one was slightly lower than the overall scale (M = 3.48, SD = 0.80). Factor two had the highest average score (M = 3.94, SD = 0.74),

while factor three had the lowest (M = 3.35, SD = 0.85). Data fit guidelines for normality (Hair et al., 2010a).

Internal Consistency Reliability

The PAS displayed internal consistency (α = .95) with factors one (α = .92), two (α = .89), and three (α = .87) also demonstrating good consistency. Inter-item correlations ranged from .13 to .71. Inter-factor correlations hovered around .60 (see Table 10). Overall, the PAS showed evidence of being a reliable measure.

Interpretation

For a factor to be considered interpretable there are several criteria it must meet: a) factors should be overdetermined, or have multiple high-loading items, b) have low cross-loadings, c) demonstrate internal consistency reliability ≥ .70, and d) be theoretically meaningful (Walker, 2018). The factors that resulted from the three-factor PAF with promax rotation fit all of the above requirements. Factors then needed to be named. They are usually named based on a salient common feature among the variables in each factor, but there are several things to consider. First, the naming of factors is done to provide ease and clarity in communication. It does not mean that we have an understanding of the factor or that the factor is even properly named (Kline, 2016). Researchers should also be cognizant of the jingle-jangle fallacy; factors are not necessarily the same because they have the same name, and they are not necessarily different because they have different names (Kline, 2016). Instead, it is important to pay attention to the relationship among the variables, the factor's relationship with other

variables, and their replicability (Gorsuch, 1983; Tucker & MacCallum, 1997). A cursory interpretation is provided with further interpretation in the discussion.

Factor One. Factor one was labeled *Behavioral Avoidance* (α = .92). This factor was responsible for a majority of the variance in the sample (38.53%). The items on this scale described avoidant behaviors while studying and were similar to procrastination items (Steel, 2010). For instance, the Pure Procrastination Scale includes an item "I waste time on trivial matters before deciding," while factor one included the item "I can't help but get distracted by more trivial things." The items that loaded highest on this factor included: "I make excuses not to study," "I find it difficult to focus," and "I avoid it by doing chores." Items centered on pushing things off until later or finding distractions to avoid dealing with the target task.

Factor Two. Factor two explained 8.18% of the variance and was named *Cognitive Stress* (α = .89). This factor proved to be the most difficult to identify and interpret. Items focused largely around worry and frustration. The highest loading items were "I worry about the uncertainty of my grade," "I feel frustrated with myself when I am not able to focus," and "I get frustrated when I feel I am not studying effectively." These items represent more of the cognitive side of the negative feelings associated with *preparation anxiety*. For example, "worry" indicates that thoughts are occurring surrounding the object of worry.

Factor Three. Factor three was termed *Affective Nerves* (α = .87) and accounted for 6.41% of the variance. Items described the overwhelming nature of *preparation anxiety*, focusing on anxiety, and some of the physiological accompaniments of anxiety.

For example, “I tend to lose sleep,” and “I feel discomfort” both describe physical symptoms. Items loading highest on this factor included: “I need to calm myself down frequently,” “I feel very nervous/anxious,” and “When I look back at my behavior while working on a project, I often realize that I must have been stressed, even if I did not know it at the time.” These items appear to get at the “hard to describe” aspect of *preparation anxiety*, specifically the all-encompassing, low-level nerves that accompany *preparation anxiety*.

Test-Retest Reliability

In order to test whether the measure had good test-retest reliability, participants completed items at two separate timepoints. Major attrition occurred between timepoint one and timepoint two. Of the original participants, 188 retook the original 66-items. Participants received a link to the second survey one week after completing the first survey and had one week from that point to complete it. Participants completed the items an average of 7.8 days after completing the first survey.

Like the original data set, data were first checked for missingness. Missingness ranged from 0%-1.5% for the 66 items, though the majority of items were missing no data. Missing values were replaced with the series mean. Data were checked for normality and scale and factor scores were calculated. Data were then paired with the original data. One participant was removed for failure to identify their previous data.

Descriptive statistics showed a similar pattern to the original data. The full 66 items had a mean of 3.53 (SD = 0.46), while the 32 items in the final solution had a mean of 3.74 (SD = 0.59), indicating that participants endorsed higher levels of *preparation*

anxiety the second time around. Scores for factors one (M = 3.61 SD = 0.70), two (M = 4.18 SD = 0.60), and three (M = 3.47 SD = 0.82) were higher at the second timepoint than the first.

Few guidelines exist regarding the standard value accepted as adequate test-retest reliability. It is difficult to pinpoint any one minimum value when it depends on the purpose of the test (Crocker & Algina, 1986). That being said, in general, any Pearson correlation greater than .70 tends to be considered acceptable. The original 66 items showed adequate test-retest reliability (r = .73). The 32 items chosen for the final measure showed even greater test-retest reliability (r = .81). Additionally, the factor reliabilities were also adequate (factor 1: r = .81, factor 2: r = .71, factor 3: r = .74). Furthermore, a high intraclass correlation coefficient (.88) indicated high agreement between participant's scores at time one and time two. For the purposes of the current measure, it makes sense that there may be some fluctuation between scores depending on how salient the experience is to the individual at the time. For example, a student would likely score higher on the measure if they were right in the middle of finals than if they were to take it in the middle of the summer.

Correlational Analyses

Correlational analyses were completed to address the research question, "What constructs is *preparation anxiety* related to? What is it not related to?" and establish convergent and discriminant validity. Correlations were looked at between each of the previously described scales and subscales. Additionally, the relationships between factors and other constructs were explored.

The PAS was significantly positively associated with depression, shame, trait anxiety, fear of negative evaluation, test anxiety, neuroticism, procrastination, and intolerance of uncertainty. Self-handicapping had a strong correlation with *preparation anxiety* when measured using the SHS, but it revealed a weak association when measured using the ASHS. *Preparation anxiety* also showed a positive, though weak, association with guilt. The PAS was significantly negatively associated with self-esteem, self-liking, self-competence, conscientiousness, and extraversion (see Table 11).

The relationships between the constructs and the different factors were also explored. Factor one, labeled *behavioral avoidance*, was more strongly related to self-handicapping than the PAS as a whole. Unsurprisingly, this factor also correlated strongly with procrastination. *Behavioral avoidance* followed a similar pattern as the PAS, correlating positively with depression, shame, anxiety, fear of negative evaluation, test anxiety, neuroticism, and intolerance of uncertainty and negatively with self-esteem, extraversion, conscientiousness, self-liking, and self-competence. Several new, but small, relationships emerged. Behavioral avoidance was weakly negatively related to the personality traits agreeableness and openness to experience (see Table 11).

Factor two, or *cognitive stress*, revealed the weakest relationships amongst the other constructs. *Cognitive stress* was still positively associated with self-handicapping (SHS only), depression, shame, trait anxiety, fear of negative evaluation, test anxiety, procrastination, and intolerance of uncertainty, and it was negatively associated with self-esteem, self-liking, and self-competence. *Cognitive stress* also had weak negative relationships with extraversion and conscientiousness (see Table 11).

The third factor, termed *affective nerves*, was positively related to self-handicapping, depression, shame, guilt, trait anxiety, test anxiety, fear of negative evaluation, neuroticism, procrastination, and intolerance of uncertainty. This factor shared a stronger correlation with test anxiety than any of the other factors. *Affective nerves* was negatively associated with self-esteem, extraversion, conscientiousness, self-liking, and self-competence (see Table 11).

Convergent and Discriminant Validity

Convergent validity, or the degree to which two measures relate, is an important part of validating a measure, as is discriminant validity, a measure of the degree to which two measure *do not* relate. Certain measures theoretically *should* be related to *preparation anxiety*, while others should not. *Preparation anxiety* is thought to be a form of anxiety that often leads to dysfunctional behaviors such as procrastination. Because both anxiety and procrastination are believed to be components of *preparation anxiety*, investigating the correlations between the PAS and these constructs assessed convergent validity. The PAS showed convergence with trait anxiety (r = .71), test anxiety (r = .61), irrational procrastination (r = .63), and pure procrastination (r = .62). Moreover, the *behavioral avoidance* factor had an even stronger relationship with procrastination (irrational: r = .73, pure: r = .70), indicating that the factor was aptly named. While some constructs may be related to *preparation anxiety* in some small way, they would not be expected to have a large overlap. Therefore, the PAS also showed discriminant validity by not strongly correlating with constructs such as agreeableness (r = -.09) or openness to experience (r = -.11).

Discussion

Research on academic anxiety has largely focused on how anxiety negatively influences performance at the point of performance, but a second, related form of anxiety, has seemed to slip through the cracks of the literature. In the case of *preparation anxiety*, anxiety is operating differently; anxiety provokes the individual to feel anxious in the time leading up to the performance. The student begins to feel anxious or uncomfortable when they think about the work, leading them to push off (i.e., delay) the work, not effectively work, or fail to work altogether.

The Properties of *Preparation Anxiety*

The current research was conducted to develop a measure of *preparation anxiety* based on the preparatory experiences of undergraduate students. Focus groups were conducted to obtain responses regarding how students felt when they were studying or writing for their courses. Items were developed based on focus group responses. A total of 66 items were thought to be relevant to *preparation anxiety* and were included in an EFA to investigate the factor structure of *preparation anxiety*. Multiple factor structures with both oblique and orthogonal rotation were tested and items with low communalities, low factor loadings, and high cross-loadings were eliminated until a final solution was reached.

The final solution resulted in a 32-item, 3-factor scale titled *The Preparation Anxiety Scale (PAS)* (see Appendix C). The three factors that emerged were named *behavioral avoidance*, *cognitive stress*, and *affective nerves*. These three factors represent the three components of anxiety (behavior, cognition, and affect) and together constitute

preparation anxiety. All three components must be endorsed (i.e., experienced) in order for an individual to experience *preparation anxiety*. For instance, an individual could strongly endorse *behavioral avoidance* items, but if they are not also endorsing the cognitive or affective items, then their avoidance is likely not due to *preparation anxiety*.

Both the scale overall and the individual factors exhibited good internal consistency reliability as evidenced by the respective Cronbach's alphas. Additionally, the scale had good test-retest reliability. Though there are currently no other measures of *preparation anxiety*, the PAS displayed good convergent validity in that it correlated strongly with measures of trait anxiety, test anxiety, procrastination, and self-handicapping. Additionally, the PAS showed good discriminant validity by not correlating with theoretically unrelated constructs (e.g., openness to experience, agreeableness).

Behavioral Avoidance

The *behavioral avoidance* component emerged as the main component responsible for a majority of the variance (38.53%). *Behavioral avoidance* items included statements such as "I spend more time organizing myself to study than actually studying," "I get upset with myself for not studying sooner," and "I often find myself automatically clicking on Internet sites or browsing social media without intending to." Such statements reveal the almost undetectable, subconscious nature of *preparation anxiety*. They show both how students procrastinate and how, even when they are trying to work, they are still procrastinating in subtle ways.

It is not particularly surprising that *behavioral avoidance* surfaced as the predominant factor given that *preparation anxiety* is characterized by avoidant behaviors like procrastination and self-handicapping. This type of avoidance is thought to be the main factor related to diminished academic achievement in the face of *preparation anxiety*. Items formulating this factor depict students who struggle to even begin their work (e.g., "I have a lot of trouble getting started"), as well as those who struggle to maintain focus and discipline (e.g., "I find it difficult to focus," "I feel like I really have to force myself to do it"). Instead, students find various ways to avoid doing their work, either pushing it off until it is too late, or waiting until the anxiety they feel when anticipating actually failing overpowers the anxiety they feel over others' perceptions of them. At this point, the individual will often rush to make up for lost time. For example, they may try to study by cramming (e.g., packing all of their studying into a single instance shortly before the exam).

Cognitive Stress

The second factor, *cognitive stress*, accounted for 8.18% of the variance in the PAS and contained items such as "I worry about failing the exam or project." This factor related to students' thoughts and cognitions, and it consisted of items related to worry or frustration surrounding academics. Additionally, it seemed to somewhat address the self-critical cognitions associated with *preparation anxiety* (e.g., I get frustrated when I feel I am not studying effectively").

The items in this factor depict a student who is concerned about the outcome of their performance (e.g., "I am not worried about the outcome of my grade" (reverse

coded item)). This is an important component of *preparation anxiety* since if one does not identify with a domain, such as failure, they have no reason to fear that domain. Additionally, the items capture the frustration that can be experienced when a student is experiencing *preparation anxiety* (e.g., "I get frustrated when I do not know what I should be studying"). Moreover, some of the items target aspects of perfectionism (e.g., "I feel as though I could have always done more to prepare," "I get frustrated when I feel I am not studying effectively"). Overall, this factor represents the cognitive worries that are associated with *preparation anxiety*.

Affective Nerves

The final factor, *affective nerves*, made up 6.41% of the variance in the PAS. Items loading onto this factor consisted of "I feel nervous/anxious" and "I feel like my thoughts start racing." In a way, this factor is the most representative of *preparation anxiety*, as it relates to the most difficult to describe aspect of the nature of *preparation anxiety*. It describes the vague uneasy feeling and the more physical sensations or outcomes associated with *preparation anxiety* (e.g., "I tend to lose sleep"). Additionally, it expresses the emotionality that can be involved with *preparation anxiety* (e.g., "I feel like my emotions get out of hand").

While the behaviors associated with *preparation anxiety* are more outwardly noticeable, these feelings of unease and discomfort are thought to be the driving force behind *preparation anxiety*. The experience of *preparation anxiety* is thought to start off as such a small vague feeling of negative affect that it is not always easily identifiable (e.g., "I feel discomfort"). Sometimes it is not even noticeable until after the fact (e.g.,

"When I look back at my behavior while working on a project, I often realize that I must have been anxious or stressed, even if I did not know it at the time"). Additionally, *preparation anxiety* can be all consuming (e.g., "I can't get it out of my mind even when I am away from it"). This final factor represents the negative affective state that is associated with *preparation anxiety*.

The PAS and Other Constructs

Anxiety

Despite *behavioral avoidance* emerging as the strongest factor, the PAS was more strongly correlated with trait anxiety than any other construct, including procrastination and self-handicapping (see Table 11). This indicates that the scale is in fact measuring a form of anxiety as intended. While all three factors correlated with trait anxiety, *behavioral avoidance* and *affective nerves* had the strongest correlations. This is interesting, as it does seem to hint at the idea that anxiety and avoidance are related, or at least share some similarities. Since the factor accounting for the majority of the variance was strongly correlated with trait anxiety, this suggests that the scale is probably providing a measure of anxiety in some fashion.

Additionally, *preparation anxiety* was positively correlated with test anxiety (see Table 11). Test anxiety was correlated with all three factors but correlated most strongly with *affective nerves*. It is unsurprising that there would be a connection between *preparation anxiety* and test anxiety, as *preparation anxiety* can almost be thought of as long-term test anxiety. Although not everyone who experiences *preparation anxiety* also experiences test anxiety (or vice versa), it makes sense that those who experience anxiety

leading up to an event may also experience anxiety during that event. Moreover, the anxiety is likely to increase as the test grows closer and peaks either immediately prior to or during the performance (Salmon et al., 1989; Ryan, 1998). This indicates that early intervention for test anxiety (i.e., by addressing *preparation anxiety*) could prove beneficial.

Procrastination

The PAS also correlated highly with two measures of procrastination (see Table 11), the IPS and the PPS (Steel, 2010). Additionally, the three factors of the PAS significantly correlated with both measures of procrastination, showing the strongest relationship with *behavioral avoidance* and the weakest relationship with *cognitive stress*. There have been two camps of procrastination research, that which argues that procrastination is an irrational delay where individuals put off work despite being worse off (e.g., Steel, 2010) and a tripartite model that considers procrastination to arise from one of three factors: avoidance, arousal, and decision or choice (e.g., Ferrari, 1992). According to Steel's (2010) conceptualization of procrastination, anxiety and avoidance do not really play a role in procrastinatory behavior. However, the current research found moderate correlations between trait anxiety and procrastination and between *preparation anxiety* and procrastination. Additionally, if procrastination were due solely to irrational delay or poor study skills, it would make sense for the strength of the (negative) relationship between procrastination and conscientiousness to be stronger than the strength of the (positive) relationship between procrastination and preparation or trait anxiety. The relationship between procrastination and conscientiousness was slightly

higher than that of procrastination and trait anxiety. The strength of the relationship between procrastination and *preparation anxiety* was almost the same as that between procrastination and conscientiousness (although in the opposite direction, as aforementioned). This indicates that not just conscientiousness, but also anxiety plays a role when it comes to pushing work off (i.e., work delay).

Perhaps the real issue here has more to do with semantics than anything else. For instance, some individuals do not consider putting off work in order to protect image or self-esteem to be procrastination (Steel, 2010). It may be that these dilatory behaviors that appear to be procrastination on the surface, but are not considered so to some individuals, are actually the behaviors that are resulting from *preparation anxiety*. Though not everyone experiencing *preparation anxiety* is able to point out their motives (e.g., fear of failure) for procrastinating, it may be that those who are putting off work because of negative affect are actually experiencing *preparation anxiety*.

Self-Handicapping

Self-handicapping was also highly related to the PAS, with those endorsing more *preparation anxiety* also endorsing more self-handicapping. *Behavioral avoidance* had the strongest relationship with self-handicapping and *cognitive stress* the weakest relationship (see Table 11). This is unsurprising given that self-handicapping is characterized by avoidant behaviors, the primary factor in this measure. However, interestingly this was only the case when self-handicapping was measured using the SHS (Jones & Rhodewalt, 1982) and not the ASHS (Midgley & Urdan, 1995). This aligns with findings in Schwinger et al's., (2014) meta-analysis that found that results differed

based on which measure was used. Midgley and Urdan's (1995) scale is stricter about what is considered self-handicapping, making sure that items include a behavior, the reason for the behavior, and that the behavior occurred prior to the performance. Conversely, items on the SHS (Jones & Rhodewalt, 1982) are much more straightforward with many simply mentioning a behavior (e.g., "I tend to put things off to the last moment."). It is possible that the relationship between the PAS and self-handicapping was obscured by the ASHS (Midgley & Urdan, 1995) because the participants themselves are not necessarily aware of why they act the way they do. For instance, the item "Some students fool around the night before a test so that if they don't do well they can say that is the reason. How true is this of you?" is incredibly specific (Midgley & Urdan, 1995). In order to provide strong endorsement for this item, the student would need to be able to identify the underlying cognitive reason behind their actions and be self-aware of the purpose of their actions. *Preparation anxiety* does not always need to be overtly conscious, whereas the ASHS assumes students are aware of their motives. Moreover, it makes sense that a relationship would not be as strong (or exist at all) with the ASHS since this scale is predominantly about providing an excuse for a poor performance. This is not necessarily a characteristic of *preparation anxiety*. With *preparation anxiety*, students are not procrastinating or engaging in behaviors that are harmful to their success because they feel they need to provide an excuse to others if they do fail, they are engaging in these harmful behaviors because they feel unwell and restless. While it is possible both self-handicapping and *preparation anxiety* are driven, at least in part, by a fear of appearing incompetent to others, they are two separate

constructs with self-handicapping being more concerned about excuse-making and the outcomes.

Depression

Depression was also positively correlated with *preparation anxiety* (see Table 11). B*ehavioral avoidance* and *affective nerves* were correlated most strongly with depression, with *cognitive stress* following closely behind. Despite the fact that *preparation anxiety* is just that, a form of anxiety, it also seems to have strong ties to depression. Like many of the potential antecedents to *preparation anxiety* previously mentioned (e.g., fear of negative evaluation), depression also has strong associations with social concerns (O'Connor et al., 2002). Additionally, Lay and Silverman (1996) found that trait procrastinators reported feeling more dejected in the two days prior to an exam than non-trait procrastinators. Others have also found a relationship between depression and procrastination (Farran, 2004). This indicates that depression may play a large role in the avoidance behaviors in *preparation anxiety* or may help to exacerbate depressive symptoms.

Fear of Negative Evaluation and Shame

Fear of negative evaluation was positively associated with the PAS, showing similar correlations with all three factors (see Table 11). This suggests that much like other forms of academic anxiety, *preparation anxiety* is at least partially driven by a fear of negative evaluation. Perhaps what is most interesting is that the fear of negative evaluation is considered to be a "core construct" of social phobia (Turk et al., 2008, p.133). It appears that there may also be a strong social component to *preparation*

anxiety. For individual's suffering with social anxiety even simple social interactions can cause intense anxiety; thus, even the idea of a potential evaluation can induce fear (Turk et al., 2008). In fact, some researchers only define social anxiety as occurring in social-evaluative settings (Leitenberg, 2013). It makes sense then that schoolwork, which is inherently evaluative in nature, would induce anxiety in those who are already socially anxious.

Shame was also significantly related to *preparation anxiety* in the current study. The concept of shame shares many qualities with the fear of negative evaluation, such as feelings of helplessness, anger, and self-consciousness (Gilbert et al., 1994). Shame is conceptualized as an overall negative feeling towards the self, which is the result of stable, internal attributions (Lutwak & Ferrari, 1997). Shame also shares overlap with social anxiety (Lutwak & Ferrari, 1997). Both constructs involve worry surrounding social interactions with others, and research indicates the two are related (Harder & Zalma, 1990). This indicates that *preparation anxiety* possibly stems from a fear of social evaluation.

The Self

Preparation anxiety was also significantly negatively correlated with self-esteem, self-liking, and self-competence (see Table 11). These findings are consistent with previous findings that procrastination is negatively associated with self-esteem (Senécal et al., 1995; Kord Tamini et al., 2013). Moreover, procrastination has been associated with self-reported low self-esteem and high social anxiety (Ferrari, 1991). Additionally, academic anxiety has been inversely related to self-esteem in various studies (e.g.,

Newbegin & Owens, 1996). These findings suggest that low self-esteem may be a risk factor for *preparation anxiety*.

The relationship between the PAS and self-competence was not as strong, but still quite significant. However, this makes sense given the types of items used to measure self-competence (e.g., "I perform very well at many things," "I am a capable person"). Studies have consistently found that low self-esteem is positively related with underestimation of one's academic performance (e.g., Morrison et al., 1973; Morrison & Morrison, 1978). Therefore, it is logical that those with a poor perception of themselves as a whole would also have a poor perception of their academic abilities, regardless of their true capability. Again, this suggests that a poor or uncertain sense of self-esteem is a potential factor in *preparation anxiety*.

Personality

The PAS was significantly correlated with several of the Big Five personality traits (see Table 11). Neuroticism, which is characterized by insecurity and emotionality, was strongly positively correlated with *preparation anxiety*. This is in line with previous research which found that neuroticism was associated with increased anxiety preceding upcoming exams and feelings of insecurity surrounding preparatory abilities (McCown & Johnson, 1991). *Preparation anxiety* also correlated negatively with conscientiousness, though it may be important to point out that this relationship was not as strong as the one between *preparation anxiety* and neuroticism. Once again, these findings suggest that putting off work may not just be due to low conscientiousness or poor work ethic, but that there exists an emotional component as well. Additionally, just as anxiety hinders

performance in performance anxiety, these findings suggest that anxiety may also hinder performance in an ongoing way in the case of *preparation anxiety*, affecting an individual's ability to behave conscientiously. Results between extraversion and *preparation anxiety* somewhat support the idea that *preparation anxiety* stems from social concerns as there was a weak negative correlation between the PAS and extraversion. The PAS did not significantly correlate with either agreeableness or openness to experience.

Intolerance of Uncertainty

Intolerance of uncertainty refers to the tendency to hold negative beliefs about uncertain events and to experience negative reactions to such events (Buhr & Dugas, 2009). Given that academic outcomes are typically uncertain, being more intolerant of this uncertainty may lead to maladaptive behaviors such as procrastination (Fourtounas & Thomas, 2016). In the current sample, intolerance of uncertainty was, in fact, positively correlated with the PAS (see Table 11). These results suggest that the uncertainty associated with academic outcomes may be one of the driving forces behind *preparation anxiety*.

Limitations

The current research provides an initial understanding of *preparation anxiety*, yet several limitations exist. First, the study contained a moderate sample size (N =252), not following the more stringent sample size recommendations put forth. For instance, in cases with fewer than 300 participants, Worthington and Whittaker (2006) encourage only retaining items with communalities greater than .50 or at least having at least 10

participants per every item with factor loadings of at least .40. The current study followed more lenient guidelines, retaining items with communalities and factor loadings above .40 and containing a participant to item ratio of 3.82:1.

Though the sample was more ethnically diverse than many undergraduate samples, not all groups were equally represented. For example, the majority of the sample was made up of Latinx and Asian/Asian-American students. Additionally, participants were predominantly female, and in their first two years of their undergraduate studies. This could have some impact on findings. For instance, both females, and less experienced students, experience more academic anxiety than their counterparts (e.g., von der Embse et al., 2018). This means that findings might potentially be different with a more representative sample.

Additionally, all data were self-reported. As Ryan (1998) found, differences can exist between self-reported anxiety and behavioral measures of anxiety (e.g., heart rate). Additionally, some students may be more likely to endorse extreme answers, while others adopt a more conservative self-report style. If this difference were not random, it might obscure differences in *preparation anxiety*. Therefore, including an additional behavioral measure would be ideal.

Other limitations involve test-retest reliability. Major attrition occurred between timepoints. Sixty-four participants dropped out of the study after the first timepoint. Another limitation was the small span of time (approximately 8 days, on average) between the timepoints measuring test-retest reliability. Due to the brief 10-week quarter system and fear of attrition, participants received the link to complete the *preparation*

anxiety items only one week after completing them the first time. The lack of time between the completions of the two measures may have inflated the measure's test-retest reliability.

Finally, data were collected during the COVID-19 pandemic. It is unclear what effect, if any, this may have on *preparation anxiety*. Additionally, though the surveys were administered during the pandemic, the focus groups were conducted pre-pandemic. Thus, items surrounding *preparation anxiety* were developed based on responses prior to COVID-19, but items were administered to students currently undergoing a transition to remote learning due to the pandemic. Though unlikely to have a major impact, it is possible that *preparation anxiety* looks different today or would look different pre-pandemic or post-pandemic.

Future Directions

With this being the beginning of the study of *preparation anxiety*, there are many different research avenues to explore. However, first, performing and interpreting a CFA should confirm factor structure results. This will help to ensure that the components of *preparation anxiety* are correctly understood.

Results indicate that there may be a social component to *preparation anxiety*. Many of the constructs that related to *preparation anxiety* (e.g., fear of negative evaluation, self-esteem) also relate to social anxiety. It appears there is a strong social component behind *preparation anxiety*; just as those with social anxiety are more likely to experience stage fright, it seems those with social anxiety may also be more prone to preparation anxiety. An overall fear of being evaluated by others in any capacity may be

at the forefront of *preparation anxiety*. This would be unfortunate, as it would prevent individuals from even trying to reach the accomplishments they wish to achieve, because the risk of being judged is too high. Future research should look further into the role that social anxiety plays in *preparation anxiety*, as it may help inform future interventions.

Additionally, future research should investigate any possible ethnic differences in *preparation anxiety*. The stereotype threat literature (e.g., Steele, 1997) indicates that anxiety affects stereotyped individuals at every level of preparation for a performance. This indicates that minorities may be more likely to experience *preparation anxiety* and its detrimental effects. This could be especially harmful to these groups that already have a variety of hurdles inhibiting their academic achievement. It is important to identify any groups especially susceptible to the effects of *preparation anxiety*, in order to work to alleviate these symptoms for them.

Finally, research should be targeted on interventions for *preparation anxiety*. Research should start by identifying at what point prior to performance *preparation anxiety* begins. Identifying when students start to experience negative effects from their *preparation anxiety* would identify when intervention should be initiated. One place to begin with intervention attempts may be to employ relaxation techniques. Relaxation techniques have previously been shown to alleviate forms of performance anxiety (e.g., Kenny, 2005). Additionally, cognitive-behavioral therapy has consistently been one of the best techniques for reducing music performance anxiety (Kenny, 2005). Therefore, it is likely that similar therapies could help treat *preparation anxiety* and should be investigated.

Conclusion

In conclusion, the PAS was developed as a measure of *preparation anxiety* containing three factors: *behavioral avoidance, cognitive stress,* and *affective nerves. Behavioral avoidance* refers to avoidant behaviors surrounding schoolwork such as use of social media. *Cognitive stress* consists of items pertaining to thoughts of worry and frustration regarding academics. Finally, *affective nerves* represents the difficult-to-describe emotional component of *preparation anxiety*, such as the feeling of discomfort. Together, all three components make up *preparation anxiety*. The PAS was found to be positively associated with procrastinating, self-handicapping, depression, test anxiety, intolerance of uncertainty, fear of negative evaluation, shame, and neuroticism. Conversely, the PAS was negatively associated with self-esteem, self-liking, self-competence, conscientiousness, and extraversion. Overall, this work helps to paint a picture of what *preparation anxiety* is, and what the profile of a student high in *preparation anxiety* may look like.

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Appendix A: Focus Group Interview Script

Hello, and welcome to our focus group. Before we actually begin our discussion, I'd like to take a few minutes here to cover some information about what we're going to be doing today. At this point, all of you should have filled out your informed consent briefings, which you should have received as soon as you arrived. Has everybody gotten one of those, and signed them?

So, what we want to do today is to talk with you about what it's like for you as a student when you have an exam that you have to study for. We're mainly interested in what you feel and how that leads you to behave. So, for example, some students find studying to be boring. Others get anxious. Some have no problems at all. Over the last week, you were asked to pay attention to what you think and how you feel when doing academic work preparing for academic performances. Please think back to this past week when answering these questions.

So, I wanted to start with the question – how do you feel when you have an upcoming exam that you need to study for?

And how do you feel when you have an upcoming essay or project? Does it feel the same? Is it different? How so?

So, it appears that some of you find these things to be uncomfortable, and some of you do not. Based on that, could I ask you, how do you normally behave when you are studying for an exam? And how does your emotion influence that behavior?

And once again, how do you behave when you have an upcoming essay or project? How do your emotions influence your behavior? And is it the same or different than when you're studying for an exam?

How many of you feel anxiety at some point when you are doing academic work? Any point at all?

What point is it? And what do you do when you feel anxious over academics at that point?

Okay. So, let's talk about your most recent exam. Could you describe how you felt last time you were studying for an upcoming exam?

And how about the last time you worked on a paper?

How close to the deadline were you when you started on your most recent paper?

The last time you took a test, how close to the date of the test were you before you started studying for it?

What are some of the things that you do when you feel like you have work that needs to be done, but you find yourself avoiding it?

Are these things compulsive? What is it that spurs you to do them?

And finally, is there anything else you would like to add about how you view your study habits that we did not cover today?

Appendix B: Generated Preparation Anxiety Items

When I have a big project or test coming up…

1) I stop spending time with people who are close to me.
2R) I do not lose sleep.
3) I usually wind up creating excuses to go spend time with other people.
4) I often feel like I'm having trouble breathing.
5) I feel like I over-think a lot of things.
6R) Preparing for an exam is a positive challenge.
7) I can't get it out of my mind even when I'm away from it.
8) I need to calm myself down frequently.
9) I feel very nervous/anxious.
10) I tend to lose sleep.
11) When I look back on my behavior while working on a project, I often realize that I must have been anxious or stressed, even if I didn't know it at the time.
12) I prefer to have strict instructions for my assignments.
13) I feel there is always something more important I could be working on.
14) I get frustrated when I feel I am not studying effectively.
15) I feel frustrated with myself when I am not able to focus.
16R) I am not easily distracted by social media.
17) I feel like my thoughts start racing.
18) I find myself trying new things frequently (e.g. new ways of working, new places, new materials, etc.).
19) I worry about the uncertainty of my grade.
20) I spend more time organizing myself to study than actually studying.
21) I get very irritated at small distractions.
22) I find it difficult to focus.
23) I feel like I really have to force myself to do it.
24) I often find myself automatically clicking on internet sites or browsing social media without intending to.
25) I work on easy assignments first.
26) I have a lot of trouble focusing when it is a subject I do not like.
27) I prefer to work in blocks of time.
28) I can't help but get distracted by more trivial things.
29R) I know I have the ability to effectively get the work done.
30) I will avoid it by doing chores.
31) I make excuses not to study.
32) I spend just as much time creating a study plan as I do actually studying.
33R) I find it very easy to block out my emotions.
34) I can't listen to music that has lyrics because it distracts me.
35) I put off some of my work in an effort to get more important work done first.
36) I worry about failing the exam or project.

37) I feel like I work a lot better when there is some sort of background noise (e.g. music, a video, white noise, etc.).
38R) I am not worried about my grade.
39) It is in the back of my mind even when I am not working on the assignment.
40R) I have no trouble motivating.
41) It disrupts the normal routines (sleep, eating, etc…) that I use to regulate my daily life.
42) It does not bother me if I procrastinate.
43) I get frustrated when I do not know what I should be studying.
44R) Minor distractions don't bother me.
45R) I find it easy to get back into studying after taking a break.
46) I will try to motivate myself with small rewards.
47) I feel most anxious when I know I have already been avoiding.
48) I have a lot of trouble just getting started.
49) I work on unimportant assignments first.
50) I feel like my emotions get out of hand.
51) I feel very confused at first.
52) I get upset with myself for not studying sooner.
53) I focus best as it gets closer to the deadline.
54) It feels like I can't take a break, even if I step away from it.
55) I often feel that I have to take a breather.
56) I feel as though I could have always done more to prepare.
57R) Writing a required paper is a positive challenge.
58R) I am able to focus easily.
59) I feel like I just can't do it right.
60) When I avoid my schoolwork, I feel better in the moment.
61) I find it difficult to have fun.
62) I get nervous when it takes longer than expected to finish.
63) I find myself getting up often whenever I sit down to work.
64) I do a lot of small, nervous behaviors like biting my nails, fiddling with my hair, etc…
65) I spend more time worrying about my schoolwork than I do working on it.
66) I feel discomfort.

Appendix C: Preparation Anxiety Scale (PAS)

When I have a big project or test coming up…

1) I can't get it out of my mind even when I'm away from it.
2) I need to calm myself down frequently.
3) I feel very nervous/anxious.
4) I tend to lose sleep.
5) When I look back on my behavior while working on a project, I often realize that I must have been anxious or stressed, even if I didn't know it at the time.
6) I get frustrated when I feel I am not studying effectively.
7) I feel frustrated with myself when I am not able to focus.
8) I feel like my thoughts start racing.
9) I worry about the uncertainty of my grade.
10) I spend more time organizing myself to study than actually studying.
11) I find it difficult to focus.
12) I feel like I really have to force myself to do it.
13) I often find myself automatically clicking on internet sites or browsing social media without intending to.
14) I have a lot of trouble focusing when it is a subject I do not like.
15) I can't help but get distracted by more trivial things.
16) I will avoid it by doing chores.
17) I make excuses not to study.
18) I worry about failing the exam or project.
19R) I am not worried about my grade.
20R) I have no trouble motivating.
21) I get frustrated when I do not know what I should be studying.
22) I have a lot of trouble just getting started.
23) I work on unimportant assignments first.
24) I feel like my emotions get out of hand.
25) I feel very confused at first.
26) I get upset with myself for not studying sooner.
27) I feel as though I could have always done more to prepare.
28R) I am able to focus easily.
29) I feel like I just can't do it right.
30) I get nervous when it takes longer than expected to finish.
31) I spend more time worrying about my schoolwork than I do working on it.
32) I feel discomfort.

Table 1

Scale and subscale means, standard deviations, skew, and kurtosis

Variable	Mean	Standard Deviation	Skew[a]	Kurtosis[b]
Self-handicapping (SHS)	3.51	0.51	-0.16	0.10
Self-handicapping (ASHS)	1.83	0.76	1.12	0.99
Shame	3.31	0.66	-0.41	0.19
Guilt	4.19	0.56	-1.31	2.92
Trait Anxiety	2.51	0.56	-0.12	-0.52
Self-Esteem	2.37	0.59	-0.18	-0.20
Fear of Negative Evaluation	3.44	0.88	-0.30	-0.438
Test Anxiety	24.65	7.55	-0.59	-0.31
Extraversion	2.83	0.79	0.15	-0.00
Agreeableness	3.61	0.54	-0.37	0.37
Conscientiousness	3.09	0.52	0.20	-0.074
Neuroticism	3.33	0.79	-0.25	-0.40
Openness	3.37	0.58	0.80	-0.10
Irrational Procrastination	3.29	0.79	-0.26	-0.30
Pure Procrastination	2.96	0.97	-0.90	-0.75
Intolerance of Uncertainty	3.05	0.75	-0.32	0.08
Self-Liking	3.10	0.88	-0.18	-0.46
Self-Competence	2.86	0.53	-0.70	0.70
Preparation Anxiety Items	3.29	0.43	-0.55	0.82

[a]Standard error of skew = .15. [b]Standard error of kurtosis = .31.

Table 2

Means, standard deviations, skew, and kurtosis for 66 preparation anxiety items

Item	Mean	Standard Deviation	Skew[a]	Kurtosis[b]
1. I stop spending time with people who are close to me.	3.21	1.13	-0.33	-0.78
2R. I do not lose sleep.	2.55	1.16	0.52	-0.60
3. I usually wind up creating excuses to go spend time with other people.	2.51	1.11	0.28	-0.89
4. I often feel like I'm having trouble breathing.	2.25	1.17	0.66	-0.48
5. I feel like I over-think a lot of things.	3.98	1.03	-1.15	1.07
6R. Preparing for an exam is a positive challenge.	2.67	1.03	0.24	-0.46
7. I can't get it out of my mind even when I'm away from it.	3.48	1.20	-0.55	-0.56
8. I need to calm myself down frequently.	3.23	1.17	-0.21	-0.81
9. I feel very nervous/anxious.	3.64	1.20	-0.74	-0.32
10. I tend to lose sleep.	3.40	1.19	-0.40	-0.74
11. When I look back on my behavior while working on a project, I often realize that I must have been anxious or stressed, even if I didn't know it at the time.	3.50	1.14	-0.67	-0.23
12. I prefer to have strict instructions for my assignments.	3.52	1.11	-0.50	-0.42
13. I feel there is always something more important I could be working on.	3.40	1.04	-0.22	-0.63
14. I get frustrated when I feel I am not studying effectively.	3.74	1.02	-0.65	-0.08
15. I feel frustrated with myself when I am not able to focus.	4.00	0.93	-0.95	0.75
16R. I am not easily distracted by social media.	2.22	1.14	0.70	-0.38
17. I feel like my thoughts start racing.	3.45	1.28	-0.46	-0.66
18. I find myself trying new things frequently (e.g., new ways of working, new places, new materials, etc.).	3.13	1.18	-0.10	-0.83
19. I worry about the uncertainty of my grade.	3.97	0.98	-0.96	0.64
20. I spend more time organizing myself to study than actually studying.	3.49	1.16	-0.52	-0.54
21. I get very irritated at small distractions.	3.41	1.11	-0.45	-0.53
22. I find it difficult to focus.	3.66	1.10	-0.58	-0.37
23. I feel like I really have to force myself to do it.	3.73	1.15	-0.63	-0.49

24. I often find myself automatically clicking on internet sites or browsing social media without intending to.	3.73	1.11	-0.81	0.07
25. I work on easy assignments first.	3.82	1.07	-0.75	-0.01
26. I have a lot of trouble focusing when it is a subject I do not like.	4.07	1.03	-1.11	0.75
27. I prefer to work in blocks of time.	3.65	0.93	-0.42	-0.24
28. I can't help but get distracted by more trivial things.	3.61	1.27	-0.66	-0.03
29R. I know I have the ability to effectively get the work done.	3.96	1.23	-0.73	0.19
30. I will avoid it by doing chores.	3.10	1.20	-0.18	-0.98
31. I make excuses not to study.	3.14	1.13	-0.21	-0.90
32. I spend just as much time creating a study plan as I do actually studying.	2.88	1.20	0.05	-0.94
33R. I find it easy to block out my emotions.	2.81	1.13	0.27	-0.61
34. I can't listen to music that has lyrics because it distracts me.	3.18	1.41	-0.13	-1.28
35. I put off some of my work in an effort to get more important work done first.	3.50	1.02	-0.48	-0.19
36. I worry about failing the exam or project.	3.94	1.05	-0.99	0.45
37. I feel like I work a lot better when there is some sort of background noise (e.g., music, a video, white noise, etc.)	3.48	1.26	-0.55	-0.63
38R. I am not worried about my grade.	2.00	1.06	0.91	0.07
39. It is in the back of my mind even when I am not working on the assignment.	3.65	1.06	-0.64	-0.11
40R. I have no trouble motivating.	2.49	1.11	0.43	-0.50
41. It disrupts the normal routines (sleep, eating, etc.) that I use to regulate my daily life.	3.24	1.20	-0.35	-0.79
42R. It does not bother me if I procrastinate.	2.15	1.06	0.80	-0.05
43. I get frustrated when I do not know what I should be studying.	3.97	0.95	-0.81	0.24
44R. Minor distractions don't bother me.	2.42	1.05	0.45	-0.40
45R. I find it easy to get back into studying after taking a break.	2.58	1.15	0.29	-0.86
46. I will try to motivate myself with small rewards.	3.47	1.00	-0.78	0.23
47. I feel most anxious when I know I have already been avoiding.	3.76	1.10	-0.82	0.14
48. I have a lot of trouble just getting started.	3.74	1.16	-0.73	-0.31
49. I work on unimportant assignments first.	3.30	1.16	-0.33	-0.71
50. I feel like my emotions get out of hand.	2.84	1.24	0.24	-0.89
51. I feel very confused at first.	3.33	1.16	-0.37	-0.59
52. I get upset with myself for not studying sooner.	3.76	1.23	-0.89	-0.11

53. I focus best as it gets closer to the deadline.	3.47	1.16	-0.54	-0.48
54. It feels like I can't take a break, even if I step away from it.	3.29	1.23	-0.23	-0.92
55. I often feel that I have to take a breather.	3.48	1.13	-0.43	-0.55
56. I feel as though I could have always done more to prepare.	3.99	0.99	-0.99	0.74
57R. Writing a required paper is a positive challenge.	2.70	1.12	0.35	-0.60
58R. I am able to focus easily.	2.48	1.00	0.38	-0.45
59. I feel like I just can't do it right.	3.15	1.13	-0.20	-0.75
60. When I avoid my schoolwork, I feel better in the moment.	2.81	1.28	0.09	-1.15
61. I find it difficult to have fun.	2.89	1.25	0.04	-1.07
62. I get nervous when it takes longer than expected to finish.	3.82	1.08	-0.99	0.43
63. I find myself getting up often whenever I sit down to work.	3.33	1.21	-0.27	-0.94
64. I do a lot of small nervous behaviors like biting my nails, fiddling with my hair, etc.	3.40	1.35	-0.47	-1.00
65. I spend more time worrying about my schoolwork than I do working on it.	3.49	1.28	-0.51	-0.78
66. I feel discomfort.	3.30	1.17	-0.36	-0.65

[a]Standard error of skew = .15. [b]Standard error of kurtosis = .31.

Table 3

Communalities for unrotated 38 items

Item	Initial	Extraction
2R. I do not lose sleep.	.48	.50
5. I feel like I over-think a lot of things.	.48	.47
7. I can't get it out of my mind even when I'm away from it.	.54	.50
8. I need to calm myself down frequently.	.65	.65
9. I feel very nervous/anxious.	.70	.73
10. I tend to lose sleep.	.59	.76
11. When I look back on my behavior while working on a project, I often realize that I must have been anxious or stressed, even if I didn't know it at the time.	.54	.47
14. I get frustrated when I feel I am not studying effectively.	.62	.63
15. I feel frustrated with myself when I am not able to focus.	.65	.67
17. I feel like my thoughts start racing.	.52	.46
19. I worry about the uncertainty of my grade.	.65	.61
20. I spend more time organizing myself to study than actually studying.	.48	.42
21. I get very irritated at small distractions.	.45	.44
22. I find it difficult to focus.	.72	.69
23. I feel like I really have to force myself to do it.	.72	.68
24. I often find myself automatically clicking on internet sites or browsing social media without intending to.	.58	.50
26. I have a lot of trouble focusing when it is a subject I do not like.	.62	.60
28. I can't help but get distracted by more trivial things.	.64	.60
30. I will avoid it by doing chores.	.53	.56
31. I make excuses not to study.	.61	.60
36. I worry about failing the exam or project.	.63	.63
38. I am not worried about my grade.	.48	.44
40R. I have no trouble motivating.	.42	.43
41. It disrupts the normal routines (sleep, eating, etc.) that I use to regulate my daily life.	.47	.47
43. I get frustrated when I do not know what I should be studying.	.51	.46
47. I feel most anxious when I know I have already been avoiding.	.62	.55
48. I have a lot of trouble just getting started.	.72	.62
49. I work on unimportant assignments first.	.50	.56
50. I feel like my emotions get out of hand.	.51	.45
51. I feel very confused at first.	.60	.57

52. I get upset with myself for not studying sooner.	.64	.62
56. I feel as though I could have always done more to prepare.	.62	.62
58R. I am able to focus easily.	.47	.46
59. I feel like I just can't do it right.	.53	.48
62. I get nervous when it takes longer than expected to finish.	.52	.43
63. I find myself getting up often whenever I sit down to work.	.41	.36
65. I spend more time worrying about my schoolwork than I do working on it.	.66	.63
66. I feel discomfort.	.61	.59

Note. Extraction method: principal axis factoring

Table 4

Parallel analysis random data eigenvalues compared with FA eigenvalues

Root	Means	95th Percentile	FA Eigenvalue
1.000000	1.829363	1.919146	13.976
2.000000	1.726221	1.793612	2.809
3.000000	1.647405	1.713848	2.4141
4.000000	1.580340	1.627098	1.491
5.000000	1.521105	1.568792	1.413
6.000000	1.468787	1.510220	1.176
7.000000	1.419690	1.458790	1.015
8.000000	1.373982	1.418236	0.909
9.000000	1.326258	1.368232	0.844
10.000000	1.286071	1.323679	0.828
11.000000	1.245295	1.282044	0.764
12.000000	1.210580	1.244582	0.733
13.000000	1.172851	1.204686	0.718
14.000000	1.137791	1.169030	0.677
15.000000	1.101567	1.133501	0.645
16.000000	1.066702	1.095530	0.565
17.000000	1.034279	1.064038	0.535
18.000000	1.002580	1.032901	0.512
19.000000	.973440	1.002409	0.483
20.000000	.939019	.965551	0.465
21.000000	.908637	.932760	0.457

22.000000	.876904	.905860	0.421
23.000000	.848158	.876304	0.397
24.000000	.818508	.849713	0.380
25.000000	.788008	.818547	0.360
26.000000	.760275	.790333	0.337
27.000000	.731675	.759826	0.334
28.000000	.704854	.731019	0.325
29.000000	.680088	.704512	0.310
30.000000	.653799	.682869	0.285
31.000000	.625777	.654394	0.275
32.000000	.594360	.618484	0.249
33.000000	.566234	.592434	0.242
34.000000	.540006	.564752	0.223
35.000000	.511532	.533590	0.207
36.000000	.480494	.510469	0.179
37.000000	.443247	.482178	0.168
38.000000	.404115	.439420	0.150

Note. Eigenvalue simulation and random data generation using 100 data sets and 95th percentile

Table 5

Comparison of Rotated Factor Solutions

Factor	Initial Eigenvalues		
	Total	% Variance	Cumulative %
		3-Factor Promax	
1	12.329	38.529	38.529
2	2.616	8.175	46.704
3	2.052	6.411	53.115
		3-Factor Varimax	
1	9.292	42.236	42.236
2	2.175	9.884	52.120
3	1.548	7.037	59.157
		4-Factor Promax	
1	11.442	40.866	40.866
2	2.112	7.544	48.410
3	1.945	6.948	55.358
4	1.435	5.124	60.481
		Single Factor	
1	8.547	50.276	50.276

Note. Extraction method: principal axis factoring

Table 6

Factor loadings for three-factor promax EFA model

Item	Three-factor promax model		
	1	2	3
31. I make excuses not to study.	.86		
22. I find it difficult to focus.	.73		
30. I will avoid it by doing chores.	.73		
28. I can't help but get distracted by more trivial things.	.71		
49. I work on unimportant assignments first.	.69		
23. I feel like I really have to force myself to do it.	.68		
48. I have a lot of trouble just getting started.	.66		
51. I feel very confused at first.	.63		
24. I often find myself automatically clicking on internet sites or browsing social media without intending to.	.62		
58R. I am able to focus easily.	.57		
65. I spend more time worrying about my schoolwork than I do working on it.	.55		
20. I spend more time organizing myself to study than actually studying.	.49		
52. I get upset with myself for not studying sooner.	.47		
40R. I have no trouble motivating.	.44		
59. I feel like I just can't do it right.	.42		
19. I worry about the uncertainty of my grade.		.82	
15. I feel frustrated with myself when I am not able to focus.		.74	
14. I get frustrated when I feel I am not studying effectively.		.73	
56. I feel as though I could have always done more to prepare.		.67	
38R. I am not worried about my grade.		.64	
36. I worry about failing the exam or project.		.62	
43. I get frustrated when I do not know what I should be studying.		.57	
26. I have a lot of trouble focusing when it is a subject I do not like.		.56	
62. I get nervous when it takes longer than expected to finish.		.42	
8. I need to calm myself down frequently.			
9. I feel very nervous/anxious.			.84
11. When I look back on my behavior while working on a project, I often realize that I must have been anxious or stressed, even if I didn't know it at the time.			.65

17. I feel like my thoughts start racing.	.61
7. I can't get it out of my mind even when I'm away from it.	.58
50. I feel like my emotions get out of hand.	.57
10. I tend to lose sleep.	.53
66. I feel discomfort.	.47

Note. N = 252

Table 7

Factor loadings for three-factor varimax EFA model

Item	Three-factor varimax model		
	1	2	3
22. I find it difficult to focus.	.73		
23. I feel like I really have to force myself to do it.	.70		
31. I make excuses not to study.	.70		
28. I can't help but get distracted by more trivial things.	.69		
48. I have a lot of trouble just getting started.	.66		
65. I spend more time worrying about my schoolwork than I do working on it.	.63		
51. I feel very confused at first.	.62		
24. I often find myself automatically clicking on internet sites or browsing social media without intending to.	.61		
30. I will avoid it by doing chores.	.58		
59. I feel like I just can't do it right.	.50		
9. I feel very nervous/anxious.		.80	
8. I need to calm myself down frequently.		.74	
11. When I look back on my behavior while working on a project, I often realize that I must have been anxious or stressed, even if I didn't know it at the time.		.62	
7. I can't get it out of my mind even when I'm away from it.		.59	
17. I feel like my thoughts start racing.		.57	
5. I feel like I overthink a lot of things.		.50	
15. I feel frustrated with myself when I am not able to focus.			.74
14. I get frustrated when I feel I am not studying effectively.			.69
19. I worry about the uncertainty of my grade.			.66
56. I feel as though I could have always done more to prepare.			.63
43. I get frustrated when I do not know what I should be studying.			.57
36. I worry about failing the exam or project.			.55

Note. N = 252

Table 8

Factor loadings and communalities for single-factor EFA model

Item	Single-factor solution	
	Factor Loadings	h^2
15. I feel frustrated with myself when I am not able to focus.	.64	.41
19. I worry about the uncertainty of my grade.	.60	.36
22. I find it difficult to focus.	.70	.48
23. I feel like I really have to force myself to do it.	.78	.61
24. I often find myself automatically clicking on internet sites or browsing social media without intending to.	.67	.45
26. I have a lot of trouble focusing when it is a subject I do not like.	.72	.52
28. I can't help but get distracted by more trivial things.	.73	.53
36. I worry about failing the exam or project.	.66	.44
43. I get frustrated when I do not know what I should be studying.	.62	.39
47. I feel most anxious when I know I have already been avoiding.	.72	.52
48. I have a lot of trouble just getting started.	.77	.59
51. I feel very confused at first.	.66	.43
52. I get upset with myself for not studying sooner.	.72	.52
56. I feel as though I could have always done more to prepare.	.70	.49
59. I feel like I just can't do it right.	.61	.37
65. I spend more time worrying about my schoolwork than I do working on it.	.75	.56
66.I feel discomfort.	.62	.39

Note. N = 252

Table 9

PAS and factor means, standard deviations, skew, and kurtosis

Variable	Mean	Standard Deviation	Skew[a]	Kurtosis[b]
Preparation Anxiety	3.58	0.69	-0.46	0.27
Factor 1	3.48	0.80	-0.50	0.16
Factor 2	3.94	0.74	-0.80	0.60
Factor 3	3.35	0.85	-0.41	0.04

[a]Standard error of skew = 0.15. [b]Standard error of kurtosis = 0.31.

Table 10

Factor Intercorrelations amongst PAS factors

Factor	1	2	3
1. Behavioral Avoidance	-		
2. Cognitive Stress	.636**	-	
3. Affective Nerves	.603**	.590**	-

Note. ** correlation is significant at the .01 level.

Table 11

Pearson product-moment correlations between variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1. PA	-																						
2. Beh. Avoid.	.92**	-																					
3. Cog. Stress	.83**	.64**	-																				
4. Aff. Nerves	.81**	.60**	.59**	-																			
5. SHS	.63**	.67**	.36**	.50**	-																		
6. ASHS	.22**	.27**	.04	.19**	.35**	-																	
7. BDI	.62**	.57**	.45**	.56**	.61**	.28**	-																
8. Shame	.53**	.42**	.47**	.52**	.34**	.11	.38**	-															
9. Guilt	.21**	.08	.28**	.24**	-.01	-.22**	.09	.41**	-														
10. STAI	.71**	.64**	.55**	.63**	.67**	.30**	.80**	.44**	.11	-													
11. RSES	.64**	.60**	.46**	.56**	.63**	.25**	.73**	.42**	.04	.85**	-												
12. FNES	.59**	.54**	.46**	.51**	.49**	.19**	.51**	.52**	.23**	.60**	.59**	-											
13. TA	.61**	.49**	.51**	.62**	.42**	.15*	.50**	.45**	.29**	.55**	.47**	.51**	-										
14. BFI-E	-.27**	-.31**	-.15*	-.19**	-.38**	-.12	-.41**	-.19**	-.03	-.45**	-.44**	-.33**	-.23**	-									
15. BFI-A	-.09	-.15*	.01	-.02	-.20**	-.10	-.24**	.00	.36**	-.26**	-.30**	.01	.09	.15*	-								
16. BFI-C	-.422**	-.53**	-.18**	-.27**	-.61**	-.24**	-.42**	-.20**	.12	-.42**	-.49**	-.31**	-.14*	.31**	.34**	-							
17. BFI-N	.68**	.56**	.55**	.69**	.60**	.17**	.68**	.51**	.18**	.77**	.69**	.60**	.60**	-.37**	-.15*	-.31**	-						
18. BFI-O	-.11	-.21**	.02	-.01	-.15*	-.15*	-.14*	.01	.11	-.13*	-.22**	-.09	-.10	.29**	.15*	.19**	-.04	-					
19. IPS	.63**	.73**	.36**	.40**	.67**	.33**	.44**	.29**	-.01	.50**	.50**	.43**	.28**	-.35**	-.17**	-.64**	.40**	-.19**	-				
20. PPS	.62**	.70**	.32**	.47**	.66**	.43**	.50*	.34**	-.04	.53**	.51**	.43**	.34**	-.32**	-.18**	-.63**	.44**	-.23**	.82**	-			
21. IOU	.55**	.47**	.40**	.55**	.46**	.18**	.56**	.46**	.07	.59**	.58**	.50**	.45**	-.34**	-.18**	-.33**	.55**	-.07	.38**	.46**	-		
22. SL	.63**	.58**	.45**	.57**	.58**	.16*	.71**	.42**	.11	.82**	.84**	.60**	.47**	-.39**	-.24**	-.38**	.69**	-.17**	.41**	.41**	.52**	-	
23. SC	.54**	.56**	.34**	.41**	.58**	.26**	.59**	.28**	.02	.61**	.67**	.45**	.35***	-.41**	-.20**	-.51**	.50**	-.33**	.49**	.49**	.41**	.61**	-

Note. N = 252. PA = preparation anxiety; Beh. Avoid. = Behavioral Avoidance; Cog. Stress = Cognitive Stress; Aff. Nerves = Affective Nerves; SHS = Self-handicapping Scale; ASHS = Academic Self-Handicapping Survey; BDI = Beck Depression Inventory; Shame = Tosca shame subscale; Guilt = Tosca guilt subscale; STAI = trait items of State Trait Anxiety Inventory; RSES = Rosenberg Self-Esteem Scale; FNES = Brief Fear of Negative Evaluation Scale; TA = Sarason Test Anxiety; BFI-E = extraversion; BFI-A = agreeableness; BFI-C = conscientiousness; BFI-N = neuroticism; BFI-O = openness; IPS = Irrational Procrastination Scale; PPS = Pure Procrastination Scale; IOU = Intolerance of Uncertainty; SL = Self-liking; SC = Self-competence