Pepperdine University

Graduate School of Education and Psychology

# A QUANTITATIVE STUDY MEASURING THE RELATIONSHIP BETWEEN STUDENT MINDSET, PARENT MINDSET, AND ANXIETY

A dissertation submitted in partial satisfaction

of the requirements for the degree of

Doctor of Education in Educational Leadership

by

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# DEDICATION

I dedicate this work to my wife, Rachel, and my two boys, Justus and Caleb. You fill me with such incredible joy! My love for you only deepens with each passing day!

# ACKNOWLEDGEMENTS

Isaac Newton once wrote, “If I have seen further it is by standing upon the shoulders of giants.” The work contained within this dissertation is only possible because of the shoulders of giants on which I have had the privilege of standing. These giants include the researchers, philsophers, and educators who have laid the conceptual framework for this study. These giants also include my mentors, friends, and family who have helped mold and shape the man I am today and who have enouraged me along this journey.

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- Educational leadership with special interest toward private, faith-based schools
- Improving academic achievement while decreasing levels of unhealthy anxiety among students
- Ethical leadership
- Crisis management
- Leadership through communication

## ABSTRACT

The purpose of this quantitative study was to discover the relationship between a parent's mindset, his/her student's mindset, and the student's level of anxiety as high school seniors during the college application process. 4 private, independent, college preparatory high schools throughout southern California were included in the study. The parent survey measured the parent's mindset through the Intelligence Domain of the Implicit Theories Questionnaire (ITQ) and measured the parent's emotional stability through the Ten Item Personality Survey (TIPI). The student survey measured the student's mindset through the Intelligence Domain of the ITQ, the student's level of anxiety through the State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA), and several items related to student demographics, such as: grade point average (GPA), highest American College Testing (ACT) and Scholastic Aptitude Test (SAT) score, number of colleges to which the student applied, student race and gender. 26 parent-student pairs participated representing 4 different schools. Findings in this study showed that subjects predominently held a growth mindset which promotes learning goals, allows for healthier responses to challenges and failures, and promotes resilience, effort, and hard work. Given the small sample size, there was insufficient evidence to support that either a parent's mindset or a student's mindset is a determinant of student anxiety during the college application process. However, a significant, moderate correlation ($r = .50, p < .05$) was found between a parent's mindset and their student's mindset. There was also a significant, moderate correlation ($r = .50; p < .05$) between the number of college applications a student completed and their levels of overall anxiety. It is recommended that schools provide opportunities for parents and guardians to be educated about growth mindset. Additionally, strategies and resources should be given to parents to help aid in developing a growth mindset among their children. It is also

recommended that further research be conducted with a larger sample size to better assess whether there is a relationship between mindset and anxiety.

## Chapter 1: Introduction

When comparing equally gifted students attending college preparatory high schools, what enables some adolescents to thrive while others experience high degrees of unhealthy anxiety? Why do some students wither under the pressures and challenges associated with many college preparatory schools while others seem to be motivated by the gauntlet of challenges and high expectations? Scholars, practitioners, educators, and psychologists search to answer questions such as these (Ansary & Luthar, 2009; Artani, 2006; Ashcraft, 2002; Blackwell, Trzesniewski & Dweck, 2007; Britner & Pajares, 2006; Cassady & Johnson, 2002; Conner, Pope & Galloway, 2009; Dweck, 2007; Eskeles Gottfried, 1983; Furnham, Chamorro-Premuzic & McDougall, 2002; Hansell, 1982; Kraag, Zeegers, Kok, Hosman, & Abu-Saad, 2006; Mangels, Butterfield, Lamb, Good & Dweck, 2006; Martocchio, 1994; Mattoo & Nabi, 2012; Melman, Little & Akin-Little, 2007; Mogel, 2005; Pope & Simon, 2005; Vatterott, 2009). Many have turned to theories of intelligence—both explicit theories of intelligence (Gardner, 1999; Getzels, 1975; Guilford, 1967; Spearman, 1927) as well as implicit theories of intelligence (Dweck, Chi-yue & Ying-yi, 1995; Furnham et al., 2002; Mangels et al., 2006; Sternberg, 1985)—to provide a framework with which to provide some clarity regarding these matters. A model stemming specifically from the implicit theories of intelligence has emerged coined by Dweck (2006) as one's *mindset*. The studies associated with the mindset seem to suggest that the radical difference in students' responses to challenges and setbacks may actually be caused by their intrinsic views of intelligence (Blackwell et al., 2007). Studies suggest that these personal beliefs about intelligence can have marked effects on resiliency, learning, student achievement, and levels of experienced anxiety (Dweck, 2008).

Within this framework, Dweck (2006) explains that people can have one of two mindsets when viewing levels of intelligence: a fixed mindset or a growth mindset. In the literature addressing the mindset, a *fixed mindset* may also be termed as the *entity theory* and a *growth mindset* may also be referred to as the *incremental theory*. For the purpose of clarity and consistency, throughout this study, the terms *fixed mindset* and *growth mindset* will be used.

Those with a growth mindset believe that with perseverance, hard work, and education, it is possible for levels of intelligence within individuals to drastically increase or decrease (Dweck, 2008). Individuals with a growth mindset view the intellect as being malleable. Learning intrinsically motivates those possessing a growth mindset. These students will often times intentionally seek out opportunities for growth, not just a better grade. Students with this mindset are honest about their weaknesses and are actively looking for ways to strengthen these weaknesses through hard work, the accumulation of knowledge, and the development of their skill sets. Critical thinking is enjoyable for those with a growth mindset (Dweck, 2006, 2009). Research suggests that students affiliated with the growth mindset tend to have better grades, a higher degree of motivation, and show greater degrees of improvement in learning (Blackwell et al., 2007). In contrast to those with a fixed mindset, growth minded students view challenges as an opportunity to be stretched and, ultimately, to grow. Failures are viewed only as setbacks with a realization that potential has not yet been reached (Dweck, 2006, 2009). For students with a growth mindset, the emphasis is on learning, not on grades.

In contrast, students with a fixed mindset are not as interested in learning as they are in getting the right grade to prove their level of intelligence. These students believe levels of intelligence are fixed and cannot be markedly increased or decreased throughout time—even through hard work and determination. This leads those with a fixed mindset toward an urgency

to prove they are smart enough, intelligent enough, talented enough, or skilled enough. Validation is extremely important to those with a fixed mindset. However, validation is also difficult to achieve as it only comes with success or, perhaps, only through perfection. Failure, on the other hand, can be catastrophic for those with a fixed mindset because it is not viewed as an opportunity for growth, but as confirmation that they are not smart enough, intelligent enough, or talented enough (Dweck, 2006, 2008). This leads those with a fixed mindset to place a higher value upon appearing intelligent over developing the knowledge necessary to succeed, not only in the classroom, but beyond. Often times, those with this mindset will intentionally reject situations that may challenge them intellectually because they fear making a mistake and losing the appearance that they are smart enough. Rather than seeking to remedy or strengthen their weaknesses, students who are fixed minded actually seek to conceal their weaknesses—even resorting at times to deceit and cheating (Dweck, 2009).

According to Dweck, Elliott, & Mussen (1983), those with a fixed mindset may also be prone to higher levels of anxiety, particularly when faced with challenging tasks that may lower their confidence levels. When individuals maintain high levels of confidence, whether they possess a fixed or a growth mindset, individuals tend to exhibit mastery-oriented behavior. But when faced with challenging tasks requiring high effort with an uncertain outcome, there is a clear differentiation between the mindsets. Those with a growth mindset continue to exhibit master-oriented behavior while those with a fixed mindset often experience high levels of anxiety (Dweck & Leggett, 1988).

To date, very little research, if any, has sought to discover what relationship, if any, exists between high school students' mindset and their levels of anxiety. For those attending independent, academically rigorous, college-preparatory high schools, anxiety levels can run

high. The highest levels of anxiety for many students may be experienced during the college application process during the fall semester of their senior year. The college application process requires high effort from students and often times, the outcome is quite uncertain (Chace, 2013). This, according to Dweck, qualifies as a challenging task, a task that provides an excellent opportunity and backdrop for a study to discover whether there is, in fact, a clear delineation between how those with a fixed mindset and those with a growth mindset experience anxiety (Dweck & Leggett, 1988).

**Problem Statement**

Studies have shown that one's mindset can have a tremendous effect on an individual from the way one approaches new challenges to the way one responds to setbacks (Dweck, 2006, 2008, 2009, 2010; Mangels et al., 2006). It is also known that students across the country are experiencing high levels of academic anxiety and that high levels of anxiety can do great harm, both psychologically and physiologically (Conner et al., 2009; Pope & Simon, 2005). The dangerous effects of anxiety on adolescents have been well documented (Keller et al., 1992; Pine, Cohen, Gurley, Brook & Ma, 1998; Pynoos, Steinberg & Piacentini, 1999; Warren, Huston, Egeland & Sroufe, 1997). What remains unclear is whether a student's particular mindset affects their level of unhealthy anxiety. In addition, we know that the values and norms of a family can have a tremendous effect on their children. What is not known is whether there is a relationship between a parent's mindset and their student's mindset, and whether there is a correlation to the levels of unhealthy anxiety as experienced by their student.

**Purpose Statement**

The purpose of this quantitative study is to determine whether there is a relationship between the mindset of a high school senior attending a private, independent, college-preparatory

school and their levels of unhealthy academic anxiety specifically during the college application process. In addition, the study will also assess what, if any, relationship exists between the mindset of a parent or guardian and the levels of unhealthy academic anxiety as experienced by their student specifically during the college application process. Lastly, the study will also discover if there is a relationship between a student's mindset and their parent/guardian's mindset. Other variables within the study include a student's gender, race, GPA, highest SAT score, highest ACT score, the number of colleges receiving an application from the student, whether students applied to any selective colleges, and whether a student is attending a faith based school or non-faith based school will be explored. The following research questions will guide the study:

1. To what extent, if at all, is there a relationship between the mindset of a college-preparatory high school senior and the levels of unhealthy academic anxiety experienced during the college application process?
2. To what extent, if at all, is there a relationship between the mindset of parents and the levels of unhealthy academic anxiety experienced by their student during the college application process?
3. What relationship exists, if any, between the mindset of a college-preparatory high school senior and their parent's or guardian's mindset?
4. Are there differences in the mindset of high school seniors attending college-preparatory, private, independent schools, the mindset of their parents or guardians, or their levels of unhealthy anxiety based on selected demographic variables?

Quantitative methods are an appropriate approach for this research because the variables of interest are known and measureable. A non-experimental design capturing survey data via

electronic methods will provide the necessary data to address the research questions.

**Background of the Problem**

Generally speaking, the high school years can be quite stressful. In particular, many seniors, including those attending private, independent, college preparatory schools, experience a high degree of anxiety related to academics, GPA, athletic and artistic performance, college preparedness, nationally standardized tests such as the SAT or ACT, and the pursuit of college scholarships and grants (Chace, 2013; Daigneault & Wirtz 2008; Hannon & McNaughton-Cassill, 2011; Pope & Simon, 2005). For some of these students, the anxiety is fueled by the pressure to be accepted into a highly selective college, university, or academy. Others feel the pressure from their family to gain acceptance into one specific school, perhaps their alma mater, or perhaps purely because the college is one of the most highly selective colleges in the country. Many fear that they will not be accepted into *the* college of their choice, or perhaps, into the college of their *parent's* choice (Golden, 2009). To make matters more difficult, high school seniors face unprecedented competition to gain acceptance into the institution of their choice (Folkman, Lazarus, Pimley & Novacek, 1987). According to NACAC (National Association for College Admission Counseling), there are more students applying to colleges than at any other time in our history (Artani, 2006). However, many colleges are not accepting any more students than they have in previous years. This competition has largely led to more stringent standards of college acceptance throughout the country (Bound, Hershbein & Long 2009).The result has been increased competition among graduating high school students to attend the college of their choice.

Many students and their families go to great lengths in their attempt to be accepted into the *right* college. From participating in multiple clubs and athletic teams, to enrolling in as many

Advanced Placement (AP) classes as possible, students are often times severely lacking in the amount of recommended sleep because of their grueling schedules (Eaton et al., 2010; Foundation, 2011; Fuligni & Hardway, 2006). As one high school student explained:

> "People make it seem like you can't be competitive if you don't take a thousand AP courses," said Elaine Singerman, a junior at Oakton High School in Vienna. "It's like our educational system is eating us alive." (Artani, 2006, p. A1)

This anxiety may only be exacerbated by a narrow definition of success. "In the striving classes in America, you are where you go to college… a sense of national and global instability leads to an apocalyptic urgency about making it. The young people feel that it's now or never. Or maybe it was yesterday and I missed it" (Mogel, 2005, p. 26). This narrow view of success may add a greater sense of urgency for high school students that, in turn, may lead to heightened levels of anxiety.

In addition to discovering how a particular mindset may increase or decrease student anxiety, this study will also seek to discover how a parent's mindset may also affect the levels of anxiety experienced by their student. In recent years, studies suggest a correlation between family beliefs, values, and norms and their students' anxiety levels (Melman et al., 2007). Although these studies suggest a link between the values of parents and their adolescent's levels of experienced anxiety, to date, no known studies have sought to discover how a parent's mindset may affect the levels of anxiety experienced by their student.

Anxiety is likely experienced by many high school seniors including those in California, the setting for this study (Conner et al., 2009). Many families are hoping to get their students into one of the country's most highly selective colleges, universities, or academies (Chace, 2013; Hansell, 1982). In addition, many families are also hoping to avoid the ever increasing tuitions

through scholarships through student success in the academics, athletics, and the arts (Giacalone, 2004). Competition is abundant as many apply for few available seats (Chace, 2013; Hossler, 2004). It is this competition that leads families to enroll their students in private, independent, college-preparatory high schools. At many of these schools, high expectations are often placed upon students to gain acceptance into a highly-selective, prestigious four year college or university (Ehrenberg, 2005; Taylor, 2013). Some believe these demands can lead to higher levels of unhealthy, academic anxiety (Golden, 2009). This is a problem involving innumerable variables, but what if a student's mindset is integral to combatting this anxiety?

**Conceptual Framework**

The research surrounding the implicit theories of intelligence provides the conceptual framework for this study, in particular the concept of one's mindset as articulated and researched by Dweck and associates (Dweck, 2006). During the past century, many theories have been developed and researched surrounding extrinsic theories of intelligence, including seminal studies by Spearman (1927), Sternberg (1985), and Gardner (1993). Extrinsic theories of intelligence largely seek to define human intelligence and its many facets. Dweck's focus, however, has not been to define human intelligence per se, but instead to understand patterns and behavior that may be caused by one's personal views and theories of intelligence.

Two behavior pattern types were identified and researched extensively by Dweck and associates: the *helpless* response and the *mastery-oriented* response (Diener & Dweck, 1978, 1980a; Dweck, 1975, 1976; Dweck & Dickon Reppucci, 1973). The helpless response pattern was characterized by those who routinely sought to avoid challenges, often times with deteriorating performance when facing obstacles. Conversely, the mastery-oriented response was characterized by those who specifically sought out challenges and would continue to effectively

persevere in the midst of obstacles (Dweck & Leggett, 1988). Perhaps most importantly, these studies revealed no correlation between the skills and abilities people possess and their specific response pattern (Dweck & Leggett, 1988).

In a 1983 study (Dweck et al., 1983; Elliott & Dweck, 1988), these response patterns were found to be fostered by the orientation of one's goals. Those with the helpless response pattern maintained goals that were performance oriented—focused primarily on proving competency to others. On the other hand, those with a mastery-oriented response pattern focused on goals that were learning oriented—concerned primarily with increasing competency and learning (Dweck & Leggett, 1988; Elliott & Dweck, 1988). The task for researchers was then to explain why people with similar levels of intellect and skill would choose to adopt such varying goals.

Further research revealed the correlation of goals orientation with intrinsic theories of intelligence. These subsequent studies revealed that people who believed their intellect could not grow or diminish—a fixed mindset—typically possessed the performance oriented goals; and those who believed their intellect could grow through study and learning—a growth mindset—typically possessed learning oriented goals (Elliott & Dweck, 1988). Therefore, a correlation was discovered between one's mindset, or their intrinsic theory of intellect, and their response pattern.

This correlation between one's mindset and a one's response pattern provides the conceptual framework for this study. For students who are involved in the college application process, particularly those applying to highly-selective institutions, navigating the many challenges and obstacles can be tremendously demanding (Chace, 2013). Is it possible that students with a helpless response pattern experience higher levels of anxiety because these

challenges must be faced rather than avoided? Is it also possible that those with a mastery-oriented response pattern experience lower levels of anxiety because of their propensity to accept and even pursue challenging experiences?

**Conceptual & Operational Definitions**

There are many important concepts mentioned throughout the study. Those most key to the study that may often be misunderstood are listed below. The definitions are organized by the key variables of interest.

**Mindset**. Based upon research surrounding implicit theories of intelligence, a concept has emerged that Dweck has coined as one's mindset. According to this concept, one can possess one of two mindsets. At one end of the spectrum is the fixed mindset. Those with this mindset believe that the level of intelligence one possesses is, for the most part, stagnant. At the other end of the spectrum are those with a growth mindset who define intelligence as a potential that can only be fully realized through learning and determination (Elliott & Dweck, 1988).

***Fixed mindset***. A fixed mindset is the perception that an individual's intelligence is a fixed asset that cannot be increased or decreased through time, education, training, or effort. This study seeks to measure respondents' affiliation toward the fixed mindset with the 32 item Implicit Theories Questionnaire (Spinath, Spinath, Riemann & Angleitner, 2003). Because *fixed mindset* and *entity theory* are both used frequently within other studies within this research area, it is important to know that for the purpose of this study and for needed clarity, *fixed mindset* will be used instead of *entity theory*.

For those with a fixed mindset, high levels of psychological anxiety may have a tendency to surface (Bandura & Jourden, 1991), especially within an academically challenging environment. In a 1991 experiment with business school graduate students ($N = 60$), challenges

often found in academia such as difficult questions, assignments, and projects may be perceived by students as threats to one's fixed level of intelligence rather than a stimulus for growth (Bandura & Jourden, 1991). In another experiment involving seventy-six employees in training, the study suggests those with a fixed mindset may incur higher levels of anxiety. The study showed a positive correlation between those who thought abilities were malleable (growth mindset) and an attitude that viewed challenges and difficulties faced in training as an opportunity for greater personal growth. Conversely, those who thought abilities to be fixed were more likely to view training as a threat (Martocchio, 1994). High levels of anxiety may develop among those with a fixed mindset because they have a tendency to focus on their deficiencies rather than on accomplishing the challenging task (Bandura & Jourden, 1991; Martocchio, 1994).

***Growth mindset***. A growth mindset is the perception that intelligence is malleable and can therefore be cultivated through hard work and education (Dweck, 2008). As with the entity theory, this study also seeks to measure respondents' affiliation toward the growth mindset with the 32 item Implicit Theories Questionnaire (Spinath et al., 2003 & Angleitner, 2003). Because *growth mindset* and *incremental theory* are both used frequently within studies within this research area, it is important to know that for the purpose of this study and for needed clarity, *growth mindset* will be used instead of *incremental theory*.

The Implicit Theories Questionnaire (Spinath et al., 2003) is designed to discover one's mindset and is closely aligned to Dweck's original implicit theories scale (Dweck et al., 1995). The questionnaire is adapted to allow implicit theories to be tested within such domains as personality and intelligence as well as more specific skills such as athletics and mathematics.

**Anxiety.** When referenced in this study, anxiety, unless otherwise mentioned, refers

specifically to academic anxiety as experienced during the college application process. This study seeks to take a cross-sectional measurement of the level of anxiety among high school students through the use of the State–Trait Inventory for Cognitive and Somatic Anxiety (Grös, Antony, Simms & McCabe, 2007). The STICSA was chosen as the instrument for this study due to its functionality to distinguish between acute stress and chronic stress. Acute stress is experienced during a specific and limited period of time. This type of anxiety is experienced by many high school seniors throughout the college search process. Chronic stress is experienced during long periods of time and is not necessarily linked to a specific issue or challenge.

Anxiety, when referenced within this study, refers to unhealthy levels of anxiety unless otherwise stated. Although stress, when experienced during short spans of time, can actually be a benefit to the body and to the mind, research has demonstrated that unhealthy levels of anxiety "impairs subsequent attention and memory, and can even induce profound amnesia" (Kim & Diamond, 2002, p. 453). According to extensive research, for someone to be stressed, one must have some sort of physiological response to the stressor, must perceive the stressor as aversive, and must sense a lack of control in regard to the stressor (Kim & Diamond, 2002).

To measure anxiety, the State–Trait Inventory for Cognitive and Somatic Anxiety (STICSA) tool will be used. The STICSA is based upon the definitive inventory for measuring anxiety among adolescents and adults since 1968 (Grös et al., 2007). It was the first instrument to differentiate between *state anxiety* and *trait anxiety*. State anxiety, otherwise known as acute stress, is the type experienced for a finite period of time, perhaps due to a particular stressor such as the college application process. Trait anxiety, otherwise known as chronic stress, is the type that can be experienced during a much longer period of time. In addition, the STICSA was chosen as the instrument in this study because it has been able to distinguish more accurately

between symptoms of anxiety and symptoms of depression (Grös et al., 2007).

**Independent, college preparatory high school.** As defined by the National Association of Independent Schools (NAIS), independent schools are independent in two key areas: governance and finance. Independent schools are free to create their own unique mission, free to create their own admissions standards, free to define teacher expectations and credentials, and free to create their own curriculum outside of the purview of any religious organization or the local, state, or federal government (Bassett, 2006).

**College preparatory seniors.** High school seniors, who are typically between 17-18 years of age and who are enrolled in a private, independent high school with an academic program that specifically prepares students for acceptance into a 4-year college, university, or academy, will be referred to throughout this study as college-preparatory seniors.

**College application process.** Although some families are preparing their child to attend a prestigious college or university even before their child is born (Quart, 2006), for the purpose of this study, the college application process will refer throughout this study to the first semester of a senior year. Although the college application process is unique for each student who chooses to apply to a college, the process always includes a list of colleges to which a student will be applying; procuring letters of recommendation from teachers, college counselors, administrators, and many others; essay writing; several meetings with a college counselor; and the completion of at least one college application (Chace, 2013).

**Highly selective college, university, or academy**. Of the 3,500 accredited colleges, universities, and academies, only about 50 typically admit 25% or fewer of those applying each year (Taylor, 2013). According to this definition, highly selective schools include those such as Yale, Harvard, Stanford, West Point, Massachusetts Institute of Technology, Julliard School,

University of Southern California, and the United States Air Force Academy.

**Assumptions & Delimitations**

This research will be limited to the collection of data from four private, independent, college-preparatory schools located throughout southern California. All schools have college/university matriculation rates consistently above 90% and routinely send many of their students to highly selective colleges and universities each year. Secondly, because this is a cross-sectional study thereby only providing a brief snapshot into the life of a high school senior, the data will be gathered during the peak of the college admissions process to give the most accurate data in terms of the potential anxiety experienced throughout this process.

Several assumptions are inherent within this study. First, it is assumed students and their parents will be honest in their responses to the survey questions. A second assumption involves the validity of the instruments used within the study to gather data which include the STICSA (Grös et al., 2003) and the ITQ (Spinath et al., 2003). The STICSA has withstood the test of validity for use with high school students. The STICSA is designed to measure the level of anxiety currently experienced by the respondent and the ITQ is designed to measure the respondent's affiliation on a continuum in regard to the mindset theory. Lastly, the third assumption is that the theories and research surrounding the mindset are both accurate and true. In addition, it is assumed that having a growth mindset is favorable over having a fixed mindset.

**Significance of the Study**

Although there has been research suggesting a relationship between students with a fixed mindset and heightened levels of test anxiety (Trudeau, 2009), to date, no empirical studies are known to the researcher seeking to identify what relationship, if any, exists between mindset of a college-preparatory high school senior and the levels of anxiety experienced during the college

application process. In addition, to date, there are also no studies known to the researcher seeking to identify what relationship, if any, exists between the mindset of a parent and the level of academic anxiety experienced by the student during the college application process.

Practically speaking, this study is critical for a number of reasons. First, if the results of this study suggest a relationship between a parent's mindset and the level of anxiety experienced by their student, tremendous strides could be taken by college-preparatory schools across the nation to lower levels of unhealthy anxiety amongst the student body. This could be accomplished, for instance, by educating parents about the growth mindset and how to encourage the growth of such a mindset within their student. In the same vein, if the research from this study suggests a relationship between a student's mindset and their own levels of anxiety, it could potentially become possible to lower levels of anxiety by educating high school students about the growth mindset. Research suggests that students who are taught about the growth mindset can, to a much greater degree, adopt a growth mindset as their own mindset with the result being a higher degree of effort being displayed in the class, in studying, and in the completion of homework (Blackwell et al., 2007). Lastly, the results of this study could also provide college counselors with information that could benefit their students in an applicable and personalized manner. Simply stated, if the possession of a growth mindset leads to decreased academic anxiety, it may become possible to decrease unhealthy levels of anxiety among high school seniors throughout the nation.

**Summary**

The general purpose of this study is to discover what relationship exists between a particular mindset (fixed mindset or growth mindset) and levels of experienced anxiety. Specifically, this quantitative, cross-sectional study seeks to discover, (a) whether there is a

relationship between the mindset of a college-preparatory high school senior and their levels of academic anxiety specifically during the college application process, (b) whether there is a relationship between the mindset of a parent and the levels of academic anxiety as experienced by their student specifically during the college application process, (c) whether a relationship exists between the mindset of a college-preparatory high school senior and their parent's or guardian's mindset, and (d) whether there are differences in the mindset of seniors attending college-preparatory, private, independent high schools, the mindset of their parents/guardians, or the academic anxiety experienced by the students based on selected demographic variables.

The second chapter provides a review of literature as it relates to the various concepts and theories presented within this study including the theoretical framework, the history of the college application process is explored from 1869 to present, and an extensive review of the literature surrounding the variables of mindset and academic anxiety. The third chapter presents the study's methodology including the design, rationale, sampling methods and participants, and instrumentation, as well as the data collection procedures, preparation, and analysis.

## Chapter 2: Literature Review

The general purpose of this study is to discover whether there is a relationship between the mindset of a high school senior attending a private, independent, college-preparatory school and their levels of academic anxiety specifically during the college application process. In addition, the study will also assess what, if any, relationship exists between the mindset of a parent/guardian and the levels of academic anxiety as experienced by their student specifically during the college application process. Lastly, the study will also discover if there is a relationship between a student's mindset and their parent or guardian's mindset. Prior to an effective study in this area, one must understand the research that has preceded this study, including studies surrounding the mindset, the college application process, as well as acute and chronic anxiety.

First, the review of literature for this chapter begins with the examination of the study's conceptual framework: mindset. Although the focus of the study specifically relates to the framework of implicit theories of intelligence, in particular Dweck's model of the mindset (2006), the review of literature will begin with a brief discussion surrounding explicit theories of intelligence. The review of literature will more heavily focus upon the model of mindset and its many implications, specifically those relating most to the focus of this study: the way each mindset tends to see performance goals versus learning goals, how each perceive failure and effort, the studies involving the mindset and academic achievement, and the role of the mindset as it relates to anxiety. The review of literature includes the latest research regarding the biological functioning of the brain and how it may be affected by one's mindset.

Also included within the literature review is research in regard to academic anxieties such as test-anxiety, subject-specific anxiety, and college application anxiety. The review of literature

will conclude with a discussion of studies surrounding anxiety as it relates to institutions that are faith based versus those that are not faith based.

This literature review will also include an historical background to the college acceptance process within the United States from 1869 to 2013. This includes the evolution of nationally standardized tests, the increasing percentage of students choosing to enroll in a college or university, as well as the total number of colleges and universities within the country during this same time period.

## Theories of Intelligence

**Explicit theories of intelligence**. Although people have their own implicit theories, lay theories, or personal beliefs regarding intelligence, many scholars have sought to extrinsically define intelligence based upon philosophy, psychology, and empirical evidence (Mackintosh, 1998). Both modern and ancient academics alike have wrestled with the concept of intelligence. The ancient Greek philosophers, Plato and Aristotle, each had their own definitions. For Plato, intelligence was purely the love of learning and of truth. Aristotle, however, articulated intelligence as the ability to discover causal relationships (Mackintosh, 1998).

Modern academics and scholars have continued to wrestle with attempts to define and explain this difficult concept of human intelligence (Gardner, 1999; Getzels, 1975; Guilford, 1967; Spearman, 1927). Through scientific inquiry, the objective has been "to advance beyond this primitive, common-sense understanding (often termed 'folk psychology') to a more securely grounded set of ideas, based on empirical evidence and capable of ordering the world in possibly new and illuminating ways" (Mackintosh, 1998, p. 2). In terms of theoretical development regarding human intelligence, some of the most influential figures in the 20th century include Francis Galton (1822-1911), Alfred Binet (1857-1911), and Charles Spearman (1863-1945).

A cousin of Charles Darwin, father of evolutionary theory, many of Galton's ideas regarding intelligence actually stem from Darwin's theory of natural selection. Galton furthered the field of intelligence theory with two key findings. First, Galton discovered through empirical evidence that intelligence varied greatly among human beings. Second, he maintained that intelligence was hereditary in nature (Mackintosh, 1998).

Another influential figure, Alfred Binet, not only developed theories regarding intelligence, but, perhaps more importantly, he also successfully developed a test to measure levels of intelligence within individuals. Binet defined intelligence as the ability to judge, comprehend, and reason at a high level. He also clarified his belief that intelligence was not scholarly knowledge. Therefore, his scales did not seek to measure one's knowledge, but they instead attempted to measure the natural levels of intelligence within individuals. These scales have been so successful, in fact, that the Binet scales of 1911, his last attempt before his death to measure levels of natural intelligence, have established the foundation for contemporary IQ tests (Mackintosh, 1998).

Another influential academic in regard to the theory of intelligence was Charles Spearman who theorized the importance of a single process of general intelligence, simply referred to as *g* (Spearman, 1927). Although Spearman understood that there were many components to one's intelligence, through factor analysis, he found that these components could be accurately simplified through the measurement of the singular entity of general intelligence (Mackintosh, 1998).

Many have theorized in opposition to Spearman's general intelligence, believing his definition of intelligence too narrow. Dissidents include the likes of Thurstsone, Guilford, and Gardner (Mackintosh, 1998). The most contemporary of these authors is Gardner (1993, 1999)

who theorized the existence of eight key and separate intelligences: logical-mathematical, linguistic, spatial, musical, bodily-kinesthetic, naturalist, intrapersonal, and interpersonal intelligences (Gardner, 1999).

**Implicit theories of intelligence**. While many scholars have continued to define intelligence in an explicit manner, during the past few decades, others have begun the task of studying individuals' implicit theories of intelligence, those beliefs about intelligence that individuals maintain, whether consciously or unconsciously. These theories are most central to this particular study (Dweck et al., 1995; Furnham et al., 2002; Mangels et al., 2006; Sternberg, 1985). The most published model incorporating implicit theories of intelligence has been crafted and coined by Dweck (2006) as one's mindset.

The studies associated with the mindset seem to suggest that the radical difference in students' responses to challenges and setbacks may actually be caused by their intrinsic views of intelligence (Blackwell et al., 2007). Studies suggest that these personal beliefs about intelligence can have marked effects on resiliency, learning, student achievement, and perhaps even levels of experienced anxiety (Dweck, 2008).

**Mindset**. According to Dweck (2006), there is a spectrum ranging from the fixed mindset to the growth mindset. Those affiliated with the fixed mindset understand intelligence levels per individual to be fixed. They believe that there is only a certain amount of intelligence that a person possesses and not much, if anything, can be done to expand or to shrink one's level of intelligence. On the other hand, those with a growth mindset believe people can incrementally grow in intelligence through time, dedication, and hard work (Dweck, 2006).

Empirical studies strongly suggest widely contrasting results between those with a growth mindset and those with a fixed mindset, results that span multiple variables such as

gender, age, ethnicity, culture, and socioeconomic status (Aronson, Fried & Good, 2002; Blackwell et al., 2007; Diener & Dweck, 1980; Dweck, 1976, 1995, 2006, 2008, 2010, 2012; Dweck & Dickon Reppucci, 1973; Elliott & Dweck, 1988; Erdley & Dweck, 1993; Good, Aronson, & Inzlicht 2003; Mangels et al., 2006; Rattan, Savam, Naidu & Dweck, 2012). Contrasting results between these two mindsets include the creation of performance goals versus learning goals (Dweck & Leggett, 1988; Elliott & Dweck, 1988; Mangels et al., 2006), contrasting responses to failure (Dweck, 2006; Moser et al., 2011; Plaks & Stecher, 2007), different viewpoints regarding the need for effort and hard work (Dweck, 2006, 2010; Elliott & Dweck, 1988), and contrasting longitudinal results in terms of academic achievement (Aronson et al., 2002; Good et al., 2003; Mangels et al., 2006). Although there are numerous empirical studies spanning multiple variables and multiple methodologies, little research has been completed to discover what relationship exists, if any, between one's mindset and the levels of experienced anxiety. Before studying what is not known regarding mindset and anxiety, the following review of literature will begin with what is known.

***Performance goals vs. learning goals***. Studies suggest a wide contrast between those with a fixed mindset and those with a growth mindset in terms of their own personal achievement goals (Dweck & Leggett, 1988; Elliott & Dweck, 1988). Those with a growth mindset typically develop and maintain learning-focused goals. These types of learning-focused goals are mastery-oriented and place tremendous importance upon personal growth, the development of knowledge, and continued improvement (Dweck, 1986; Elliott & Dweck, 1988). Conversely, those with a fixed mindset typically have performance-focused goals. These types of performance-focused goals are typically task-oriented and place emphasis upon measuring up to a certain standard with the purpose of proving the worth, talent, or intellect (Elliott & Dweck,

1988). As opposed to mastery-orientation, the behavior pattern found to be typically associated with this type of learning goal is *helplessness* (Diener & Dweck, 1978, 1980; Dweck, 1975; Dweck & Leggett, 1988). As it relates to this study, in addition to this characteristic of learned helplessness, those with a fixed mindset and the resulting performance-oriented goals remain highly vulnerable to any type of criticism or negative feedback (Mangels et al., 2006).

***Failure and effort***. Evidence suggests resiliency may also be affected by one's mindset. Studies indicate that those with a fixed mindset view failure and negative feedback much differently than those with a growth mindset (Blackwell et al., 2007; Plaks & Stecher, 2007). Those with a fixed mindset typically see mistakes and failures as a reflection of their lack of intelligence. Worse still for those with a fixed mindset, is the idea of exerting effort and still experiencing failure—for this leaves them without excuse. (Dweck, 2006). Individuals with a fixed mindset receive criticism or negative feedback, especially following the exertion of effort, as the end of the road (Dweck, 2006; Moser et al., 2011; Plaks & Stecher, 2007).

Conversely, individuals with a growth mindset typically see failure as an opportunity to grow, to learn, and to improve (Dweck, 2006; Plaks & Stecher, 2007). As previously discussed regarding personal achievement goals, the learning-oriented goals created and sustained by those with a growth mindset focus on learning and improving. Radically different than those with a fixed mindset, those with a growth mindset believe effort is the key to success (Moser et al., 2011). It is their belief in the importance of effort and toil that allows those with a growth mindset to view failure, as disappointing and painful as it may be, as a motivational impetus to continued learning, growth, and eventual success (Blackwell et al., 2007; Dweck, 2006; Plaks & Stecher, 2007). Furthermore, those with a growth mindset are highly interested in hearing feedback, even though the feedback may be negative in nature (Trope & Liberman, 2003).

***Mindset and academic achievement***. In two studies involving mindset and academics, those with a growth mindset displayed increasing levels of academic achievement as opposed to those with a fixed mindset, both in terms of GPA and achievement test scores (Aronson et al., 2002; Good et al., 2003). A 2002 study involving Stanford undergraduates ($N = 79$) sought to find whether a growth mindset would increase academic achievement scores among African-American students (Aronson et al., 2002). The study suggested not only a strong correlation between a growth mindset and a student's enjoyment of academics, but it also found a strong correlation between a growth mindset and a higher GPA (Aronson et al., 2002).

A 2003 study ($N = 138$) found an important correlation linking a growth mindset intervention to significantly higher standardized test scores among female, minority, low-income students (Good et al., 2003). According to the researchers, due to stereotypes regarding female, minority, low-income students and their proficiency for math and science, students may experience significant levels of anxiety when preparing and completing math and science sections of a standardized test. Students were randomly assigned to be a part of one of four test experimental conditions: a growth mindset intervention, an attribution intervention, a combination intervention, and an anti-drug intervention. Students who received the growth mindset intervention experienced significant improvements on both math and science standardized test scores when compared to those who were part of another intervention (Good et al., 2003).

***Mindset and anxiety***. Although there has been quite a bit of research regarding the mindset, very few studies have attempted to discover what relationship, if any, exists between mindset and anxiety. However, within this limited body of research, there seems to be a correlation between a fixed mindset and high levels of anxiety, especially within an academically

challenging environment (Bandura & Jourden, 1991).

In a 1991 experiment with business school graduate students ($N = 60$), researchers found that challenges often related to the world of academia—challenges such as difficult questions, assignments, and projects—may be perceived by students with a fixed mindset as a threat to their own intelligence rather than a stimulus for growth. This threat may lead to higher levels of anxiety (Bandura & Jourden, 1991).

In another experiment involving the training of new employees ($N = 76$), the study found that those with a fixed mindset reported higher levels of anxiety. The study showed a positive correlation between those with a growth mindset and an outlook that the challenges and difficulties experienced in training were an opportunity for greater personal growth. Conversely, those with a fixed mindset were more likely to view training as a threat to their own intelligence (Martocchio, 1994). High levels of anxiety may develop among those with low perceptions of self-efficacy because they have a tendency to focus on their deficiencies rather than on accomplishing the challenging task (Bandura & Jourden, 1991; Martocchio, 1994).

***Mindset and the brain***. In addition to psychological inquiries, there have also been two important scientific, biological studies of the brain that seem to suggest a correlation between the mindset and levels of anxiety. The first was a 2006 study from Mangels, Butterfield, Lamb, Good, and Dweck (Mangels et al., 2006). The second was a 2008 study from Compton, Robinson, Ode, Quandt, Fineman, and Carp (Compton et al., 2008).

The Mangels et al. (2006) study explored whether there is a relationship a student's mindset and how they respond to negative performance feedback, specifically whether the students were engaged in understanding feedback that could help correct an error in general understanding. The study's participants were all undergrads from Columbia University ($N = 47$).

As part of the pre-test, students were asked a series of questions to determine whether they affiliated more with a fixed mindset or a growth mindset. Of the participants, 25 were growth mindset and 22 were fixed mindset. The students were each individually asked a series of general knowledge questions. For each question, the student would give an answer to the question and would rate their confidence as to the accuracy of their answer. Following these responses, the students were given two separate types of feedback. The first feedback students received were whether or not their answer was correct. Following was a second set of feedback that included the correct answer to the question (Mangels et al., 2006).

While their brain waves were being measured, students received this feedback. Specifically, their event-related potentials (ERPs) were measured. These waveforms from the brain have been found to be associated with decision-making and error correction. The specific component studied within this waveform was the P3 wave. As the P3 waves within the ERPs from each of the participants were measured, the results showed a wide disparity between those with a fixed mindset and those with a growth mindset. This wide disparity occurred as feedback was given to each of the participants regarding the answers they gave to the questions during the test. This allowed the researchers to make some valuable discoveries in relation to how the brain operates markedly different according to one's mindset (Mangels et al., 2006).

Following an extensive analysis of the data, researchers were able to draw several conclusions. First, the ERPs of students with a fixed mindset widely differed from the ERPs of students with a growth mindset when receiving the initial negative feedback to an incorrect answer. For students with a fixed mindset, the ERPs responded in such a way that seemed to display a high degree of concern about proving their knowledge and ability to the researchers. Second, when receiving the second set of feedback and the correct answer, students with a

growth mindset demonstrated more sustained activity within the ERPs associated with memory, suggesting that individuals with a growth mindset were more interested in receiving the correct answer and learning from the feedback than were those with a fixed mindset. This was confirmed on a surprise retest of the original questions when individuals with a growth mindset more frequently corrected answers that were originally answered incorrectly as opposed to those with a fixed mindset (Mangels et al., 2006).

This study suggests that an individual's mindset seemingly modulates their brain's ERPs. These very same ERPs have been shown in previous studies to be "associated with the detection and correction of errors" (Mangels et al., 2006, p. 77), supporting the notion that people process errors differently based upon their mindset mirroring many of the earlier psychological studies mentioned earlier in this chapter.

In 2008, the Compton study sought to examine whether individual differences regarding how people process errors may also predict how they regulate their emotions. The participants ($N$ = 47), all undergrads at Haverford College, were given a Stroop color-identification task. As opposed to the Mangel et al.'s (2006) study, these participants were not given feedback as to whether or not their answers were accurate, except during the practice round. As students responded throughout the test, their error-related brain potentials were measured. In doing so, students were assessed as to their cognitive control as well as their ability to distinguish between errors and correct answers without any clarifying feedback (Compton et al., 2008).

Following the Stroop task and the measuring of error-related brain potentials, students reported over a two-week period about their anxiety levels and daily stressors. Through analysis of the data, researchers reached the conclusion that those with higher levels of cognitive control were less sensitive to daily stressors and anxiety. "The results support the notion that cognitive

control and emotion regulation depend on common or interacting systems" (Compton et al., 2008, p. 702). In short, through this research, it appears that cognitive control and emotion regulation are inextricably linked.

These two studies, when combined, seem to suggest a correlation between a fixed mindset and higher levels of anxiety, and conversely, a correlation between a growth mindset and lower levels of anxiety. If it is true that the mindset modulates the brain's ERPs (Mangels et al., 2006), which are associated with error correction, and those who more able to correct errors are also less sensitive to daily stressors and anxiety (Compton et al., 2008), then the recent study of brainwaves seem to indicate a correlation between mindset and anxiety.

**Anxiety**

With increased competitiveness among high school student who are hoping to attend one of America's most highly selective colleges or universities, it is no wonder high levels of anxiety are experienced (Conner et al., 2009; Galloway, Conner & Pope, 2009; Pope & Simon, 2005). However, it is important to first understand the definition of anxiety as well as the various types of anxiety.

Through extensive research in the field, Kim and Diamond (2002) explain that there are three necessary components that must occur before defining what one is experiencing as anxiety. First, there must be a physiological response to a particular circumstance, a response that could be verified by an outside source. A person's pulse may begin to race or their blood pressure may begin to rise. A feeling of energy may begin surging through the body. Physiologically speaking, the energy is actually the hypothalamus within the brain sending a message to the adrenal glands to release adrenaline into the blood stream (Medina, 2008). The second component involves choice. If given the choice to avoid a particular circumstance, a person experiencing stress would

choose to avoid the circumstance completely. Lastly, the person must feel as if they do not have control over the circumstance. In fact, the more powerless a person feels over a particular circumstance, the more stress and anxiety is experienced (Kim & Diamond, 2002; Folkman et al., 1987). When these components are all present, according to Kim and Diamond, stress is being experienced.

According to Folkman et al., (1987), an expert on the subject of stress, anxiety can only be understood when looking at both the person and what is going on in their environment. Analysis of the anxiety must take place when considering both of these pertinent subsystems. In his estimation, an environment cannot be considered the source of anxiety unless it is experienced by a person who cognitively has characteristics making them vulnerable to that particular environment. What causes a high degree of anxiety in one person may not affect another at all due to their personality, beliefs, personal goals, or their particular mindset. Similarly, a person or characteristic within a person cannot be considered the source of anxiety unless it contains a challenge that prevents that particular person has a stake in achieving a desired goal. If a person does not have much at stake, in spite of a circumstance that would otherwise be a stressful environment, that person will not experience anxiety (Folkman et al., 1987).

**Acute stress**. In general, there are two types of stress: acute stress and chronic stress. In small doses, acute stress can actually be exhilarating or even life-saving (Medina, 2008; Miller, Smith & Rothstein, 1993). Athletes experience acute stress when they need a peak performance. Students may experience acute stress as an assignment's deadline is quickly approaching. Healthy stress actually helps individuals overcome challenges and threats. However, when it comes to stress, our bodies were designed to solve problems that last for seconds, not for

extended periods of time (Medina, 2008). When acute stress is experienced in large doses, it can lead to a variety of symptoms including back pain, heartburn, diarrhea, constipation, irritable bowel syndrome, tension headaches, anger, irritability, and depression. Continued doses of acute stress can lead to dizziness, a rise in blood pressure, chest pain, heart palpitations, and a shortness of breath (Miller, 1993; Natvig & Albrektsen, 1999).

**Chronic stress**. When stress is experienced over a long period of time and is frequent, relentless, and grinding, it can become quite harmful both physically and psychologically. This is called chronic stress (Miller et al., 1993). Often times, chronic stress is exhibited when someone cannot see his or her way out of a difficult, long-lasting circumstance. As opposed to acute stress that is often times very noticeable by the person experiencing this type of stress, people experiencing chronic stress can actually forget about it altogether. They get used to it (Miller et al., 1993). Chronic stress also takes its toll on the body's immune system. Those experiencing chronic stress are sick more often and are more likely to have asthma, diabetes, and autoimmune disorders (Medina, 2008). It can also play havoc on the brain's ability to learn. First, chronic stress keeps people from being able to process language efficiently. Secondly, both short-term and long-term memories are affected among those experiencing chronic stress. Thirdly, it diminishes one's ability to adapt old information to new circumstances. Lastly, chronic stress inhibits one's ability to focus (Medina, 2008). "Clearly, stress hurts learning. Most important, however, stress hurts *people*" (Medina, 2008, p. 180). Symptoms of chronic stress are severe, and include: heart attacks, strokes, violent outbursts, and suicide (Miller et al., 1993).

**Academic anxiety**. High school students, perhaps more now than ever, are experiencing dangerous levels of academic anxiety that, in turn, are risking the mental and physical health of our students (Pope & Simon, 2005). A variety of reasons can be blamed for this anxiety, but

recent studies seem to indicate that our schools could actually be a key culprit for these unhealthy levels of anxiety. In a recent mixed methods study of 3,645 high school students attending Bay Area schools in Northern California, many students reported that they were highly anxious, overworked, and were routinely experiencing sleep deprivation (Conner et al., 2009). Of the respondents, 70% were always or often always stressed about schoolwork while another 56% were stressed over the college acceptance process. Respondents were also receiving far less sleep than recommended by the National Sleep Foundation (2011). Whereas the recommended amount of sleep for adolescents is 9.25 hours, respondents to this survey averaged 6.8 hours of sleep with over 34% getting an average of less than 6 hours of sleep per night. For most (67%), sleep was minimized regularly due to the amount of schoolwork (Conner et al., 2009).

When students experience unhealthy levels of academic anxiety, there are dangerous and sometimes long-lasting consequences. In a quantitative study from 1994-1998 among 862 Norwegian 7$^{th}$, 8$^{th}$, and 9$^{th}$ grade students, academic anxiety was consistently associated with psychosomatic symptoms (Natvig & Albrektsen, 1999). In the study, a strong positive correlation was found between students who reported academic anxiety with feeling low, irritable, nervous, or having difficulty sleeping (Natvig & Albrektsen, 1999). In a 2009 study incorporating 3,287 North American self-reporting teens, the analysis of the surveys linked academic anxiety to increased levels of drug and alcohol use (2009 Parents and Teens Attitude Tracking Study Report, 2013).

***Test anxiety***. In terms of the research surrounding academic anxiety to date, perhaps more research has been devoted to test anxiety than to any other category in the field. Estimates place those who experience test anxiety at anywhere between 25% - 40% (Carter, Williams & Silverman, 2008; Ergene, 2003; McDonald, 2001; Putwain, 2007). Of those who experience test

anxiety, research indicates that this type of anxiety is actually unrelated to the academic ability of the student (Cassady & Johnson, 2002). Research has also shown that test anxiety is not only experienced immediately prior and during a test, it proliferates the entire learning cycle (Cassady, 2010).

***Subject-specific anxiety***. There have been a variety of studies regarding academic anxiety as it relates to specific subjects such as Math (Betz, 1978; Ashcraft, 2002; Meece, Wigfield & Eccles, 1990), Science (Britner & Pajares, 2006; Brownlow, Jacobi & Rogers, 2000), and Foreign Language (Horwitz, Horwitz & Cope, 1986). Subject-specific academic anxiety has often been studied through the lens of a concept established by Csikszentmihalyi (1997; Goetz, Pekrun, Hall & Haag, 2006; Schiefele & Csikszentmihalyi, 1995; Shernoff, Csikszentmihalyi, Schneider & Shernoff, 2003) which was introduced in 1975, a concept coined as *flow*. According to this concept, the holistic experience of flow is achieved when someone's whole being acts with absolute involvement (Csikszentmihalyi, 1997). This occurs when there is a perfect balance between challenges and skills. When flow is not achieved, the result is either anxiety or boredom. On one hand, anxiety is experienced by those facing challenges for which they do not possess the necessary skills to overcome. Conversely, those who possess high skills but who are not challenged experience boredom (Csikszentmihalyi, 1997). This has been termed the three-channel model of flow. In 1997, a four-channel model of flow was proposed which added the fourth element of apathy. Whereas flow was the balance of high challenge and high skills, apathy is experienced with low challenge and low skills (Novak, Hoffman & Yung, 1998). Developing this model further, an eight-channel model of flow was developed which added another four elements to this concept: arousal (high challenges and moderate skills), control (moderate challenges and high skills), relaxation (low challenges and moderate skills), and worry (moderate

challenges and low skills; (Massimini & Carli, 1988).

***College application anxiety***. As mentioned above, many students are experiencing stress and anxiety in the college application process (Conner et al., 2009). This anxiety may be traced to several causes. First, many families are placing greater emphasis upon the *best* college or university lists published in mainstream journals and magazines (Hossler, 2004). Second, there has been a dramatic increase in competition among students to attend elite institutions. Although this rise in competition will be examined later in this study, it may partially be due to the fact that more students are applying to colleges and universities than ever before. Whereas colleges and universities were frequently attended by the socioeconomically advantaged, much of this began to change in the mid-1900s. In 2012, throughout the country, 67% of seniors were graduating with aspirations and expectations to attend college (Wallace, Abel & Ropers-Huilman, 2000).

Today's high school juniors and seniors must traverse a gauntlet of challenges on the pathway to gaining acceptance to the college of their choice, particularly to those colleges deemed as highly selective. In addition to the typical challenges faced by adolescents, students during their junior and senior year must study for and complete at least one nationally standardized test (SAT or the ACT), wait for the results, visit numerous college campuses, meet with their high school college counselor, make a list of colleges they are interested in attending, apply to the colleges, and then they have to wait months for letters or emails from the colleges as to whether or not they were accepted (Hansell, 1982). For those that are seeking to attend college, the senior year has become increasingly more challenging and potentially more stressful (Hansell, 1982).

Although this process has the potential of being stressful to virtually any student, there are some potential causes that could raise anxiety levels. One of the potential sources of added

stress could be the social environment of the student and their family (Coyne & Lazarus, 1980; Slochower & Kaplan, 1980). Communities and schools place various levels of importance upon the college admission process, whether or not to apply to college, the rankings of colleges and universities, and the importance of being admitted into a highly selective institution. For students attending a private, independent, college preparatory school where nearly every student attends a college or university upon graduation from high school, this could add tremendous anxiety for students. This may particularly be true of environments where many of the students are accepted into the most highly selective colleges in the nation (Hansell, 1982).

Another source of potential stress can be a student's parents and family dynamics (Hansell, 1982). Whether or not a student's parents have graduated from college or not can have large ramifications on the student's educational goals (Alexander, Cook & McDill, 1978). This, in turn, could add additional stress for students, especially if there is a desire on the part of the parents for their student to follow in their footsteps by attending their alma mater (Hansell, 1982). In addition, it is possible that family dynamics such as older brothers and sister and their college attendance could increase anxiety as well.

Lastly, the socioeconomic status (SES) of families may also play a role in the levels of anxiety experienced by high school seniors during their college application process (Dohrenwend & Dohrenwend, 1969; Wheaton, 1980). According to the National Center for Education Statistics (NCFES), based upon the 2009-2010 US dollar, the cost of tuition has increased from the 1980 average of $7,749 to the 2010 average of $18,133 per student per year (U.S. Department of Education, 2013). With the price of an average college tuition skyrocketing during the past 30 years, this potentially could add increased levels of anxiety experienced by both students and families alike.

***College Application Process.*** Previous studies suggest that those with a fixed mindset may be more susceptible to high levels of anxiety during periods of challenge and hardship (Compton et al., 2008; Kim & Diamond, 2002; Martocchio, 1994). What remains to be seen is whether there is a direct link between a particular mindset and the levels of anxiety as experienced by high school students. This study will attempt to measure the mindset and the levels of anxiety among college preparatory high school seniors during a time period that typically is challenging, the college application process. For context, a brief history of the college application process will be studied through a review of literature surrounding the topic.

During the past 150 years, the United States has experienced exponential growth in the number of students who have attended a college or university. In 1869, there were 63,000 college students throughout the country (Snyder, 1993). In comparison, in 2010, according to the U.S. Department of Education, there were nearly 22.5 million students in degree-granting postsecondary institutions (U.S. Department of Education, NCFES, 2010). Although there were exceptions, prior to World War II, attending a college or a university within the United States had been largely reserved for only those from an elite and typically wealthy family (Hossler, 2004).

Taking national standardized tests was not an expectation for a high school junior or senior. In fact, when the first SAT was first introduced in 1926 by the College Board, it was only intended to test the brightest students from across the United States who were expected to attend the country's most elite and highly selective colleges and universities (Hossler, 2004). Following World War II, with the introduction of the GI Bill and other financial incentives for the country's war veterans, college enrollment skyrocketed (Babbidge, 1962; Hossler, 2004). Not only were there more students attending college, there was a cultural shift within the country as

to who should be attending college. Many of the veterans attending college were non-traditional students due to their age and socioeconomic background. Public opinion began to change as these veterans experienced success in the classrooms of academia (Hossler, 2004).

Standardized aptitude measuring tests also became more widely accepted following World War II. During the war, the military relied heavily upon standardized tests to more accurately place military officers. This acceptance quickly became engrained within American culture. During the decades following World War II, with the purpose of finding an accurate method to determine which students to accept, many colleges and universities began to rely more extensively upon standardized aptitude measuring tests such as the SAT and ACT, the latter of which was founded in 1959 (Hossler, 2004). Prior to 1958, student scores remained confidential, only seen by admissions staffs at the colleges and universities to which students applied. But it was during this year that the College Board made the decision to release SAT scores to be viewed by students. At that point, students and their families had a better understanding of the schools to which they most likely would be accepted, or conversely, those schools to which they most likely would not be accepted (Bowles, 1967).

With the increase of college applicants and with the increasing use of standardized aptitude measuring tests, colleges and universities were able to become more selective (Hossler, 2004). This was further magnified by the development of the Advanced Placement (AP) program in 1955 through the College Board. The AP program allowed bright high school students to complete college-level classes at their respective high school. If successful on the AP tests, students could receive college credit before graduating from high school therefore reducing the number of students (Hossler, 2004).

At the end of the 1960s, as the baby-boomer generation began to enter colleges and

universities at ever increasing rates. For the first time in American history, more graduating high school seniors were choosing to attend college than choosing to go straight into the workforce (Hossler, 2004). Compared to the 15 to 20% of high school graduates who were choosing to attend college in 1945, this was a marked increase that occurred in a period of only 15 years (Tyack, 1974). Just in a matter of 10 years, between 1960 and 1970, the number of undergraduates grew from 3.6 million to over 8 million. Students and parents alike were beginning to view a college diploma as a pathway to the middle-class, to prosperity, and ultimately, to financial security (Hossler, 2004).

Throughout the 1970s and 1980s, the process of choosing the right college became markedly more complex. One of the major developments was in the area of financial aid. Many colleges began using financial aid as a way to entice student. This was done not only to increase the size of their student body, but also to recruit the brightest and most talented students as possible (Hossler, 2004). Another chief development was the idea of ranking colleges within mainstream media. It was during this time period that college rankings were published by the US News and World Report (Webster, 1985). Students began to not only compete for opportunities to attend the country's most selective colleges and universities; it also meant that students began competing for financial aid. Many parents and students came to believe that attending a particular university could provide them with a ripple effect that would propel them through life. All of these factors, including rising college tuitions, raised the stakes within the college selection process (Hossler, 2004).

During the 1980s, the competition became increasingly fierce among students with the goal of attending the country's most selective colleges. There were several elements that caused this increased competition. First, many families were placing greater emphasis upon the *best*

college or university lists published in mainstream journals and magazines (Hossler, 2004). Second, there was increased competition among students to attend elite institutions due partly to the fact that more students were applying to colleges and universities. Throughout the country, 67% of seniors were graduating with aspirations and expectations to attend college (Wallace et al., 2000). This caused many to be denied entry to the most selective colleges, colleges that they most likely would have been accepted into just a few years prior (Hossler, 2004).

During the past 20 years, competition has only grown fiercer. Students attending a college or university have increased from nearly 14 million students in 1990 to over 22 million in 2010, a growth rate of nearly 36%. Meanwhile, according to the US Department of Education, in 2010, there was only an additional 500 post-secondary institutions founded during this same period, from around 3,600 to around 4,100, a growth rate of only 12% (U.S. Department of Education, 2010).

**Summary**

The general purpose of this study was to discover what relationship exists between a high school senior's particular mindset and the levels of their experienced anxiety. As shown, studies suggest one's mindset has key implications, including perceptions about effort and failure, the creation of personal goals, student achievement, resiliency, and the ability to learn from errors. However, due to a lack of empirical evidence, what is not as clear is whether the mindset affects anxiety, in particular for seniors at college preparatory schools in the process of applying for highly selective colleges and universities.

# Chapter 3: Methods

## Research Design

This quantitative study employed a non-experimental approach to the topic. This study gathered new data, including the following:

1. the current level of anxiety as experienced by high school seniors,
2. the mindset (fixed vs. growth) of the students
3. the mindset of the students' parents, and
4. self-reported demographic information (gender, current GPA, highest SAT score, highest ACT score, the number of schools to which the student applied, and whether the student had applied to a highly selective school)

Through analysis of the collected data, the study sought to discover the following:

1. To what extent, if at all, is there a relationship between the mindset of a college-preparatory high school senior and the levels of academic anxiety experienced during the college application process?
2. To what extent, if at all, is there a relationship between the mindset of parents and the levels of academic anxiety experienced by their student during the college application process?
3. What relationship exists, if any, between the mindset of a college-preparatory high school senior and their parent's or guardian's mindset?
4. Are there differences in the mindset of high school seniors attending college-preparatory, private, independent schools, the mindset of their parents/guardians, or their levels of anxiety based on selected demographic variables?

The research questions were investigated through the use of self-administered student and parent surveys. The student survey combined two established instruments, the STICSA (Grös et al., 2007) and the intelligence domain of the ITQ (Spinath et al., 2003) in addition to self-reported demographic questions: gender, cumulative GPA, highest SAT score, highest ACT score, the number of colleges receiving applications from the student, and whether they applied to a highly selective college, university, or academy. The STICSA was used to measure self-reported levels of acute and chronic anxiety from each participating senior. Items contained in the intelligence domain of the ITQ measured the participant's mindset. The parent survey included questions from the intelligence domain of the ITQ to discover the each parent's mindset regarding intelligence. In addition to the ITQ, Two questions were from the Ten Item Personality Survey (TIPI; Gosling, Rentfrow & Swann Jr, 2003) to measure the parent or guardian's emotional stability.

**Rationale for Study Design**

A quantitative, non-experimental approach was utilized to discover the relationship between two known and measurable variables: mindset (Blackwell et al., 2007; Dweck, 1995, 2006; Hong, Chiu, Dweck, Lin & Wan, 1999; Rattan et al., 2012; Spinath et al., 2003) and anxiety (Cassady & Johnson, 2002; Ellis & Hudson, 2010; Grös et al., 2007; Martocchio, 1994; Mattoo & Nabi, 2012). Both of the study's variables have been well established in literature as measureable constructs. Because the sought to measure and analyze these two established variables, conducting a quantitative analysis to assess their relationship was the best suited approach (Creswell, 2013).

**Population, Sampling Method, and Participants**

The participants for this study are high school seniors and one parent or legal guardian. Typically, seniors are either 17 or 18 years of age. The study included four private, independent high schools throughout Southern California. Key staff from each of the four high schools agreed to provide access to their students and parents to be invited to participate in this study. All seniors and their parents at each participating school were invited to complete the surveys. To protect the identities of these sites and the participating students, these schools will only be referred to throughout this study using pseudonyms.

School A is a private, independent, college preparatory high school located in a suburban community near Los Angeles with a population of just over 8,000 people (U.S. Census Bureau, 2010). The town consists of small neighborhoods with the average home price of over $700,000 as of 2012. According to the 2010 census, 89% of the population was white, 6% were Asian, 1% was African American, 2% from other races, and 3% from two or more races. Over 6% declared they were either Hispanic or Latino. The community has a history of excellent public schools. The local public high school regularly ranks within the top ten highest achieving high schools in the state of California with a graduation rate over 98% and an 881 Academic Performance Index (API) score (California Department of Education, 2012).

School B is a private, college preparatory high school located in the suburbs of Los Angeles. The 2010 U.S. Census found there to be just over 20,000 people living in this suburb with 69% being white, 1% being African American; 26% being Asian; 1% declaring themselves to be in the "other" races category. Another 3% declared that they were of two or more races, and lastly, 6% declared themselves to be Hispanic or Latino. The area surrounding the school has an average home price of over $800,000. The local school district is one of academic

excellence. For example, the nearest high school has an API of 942 and has a 98% graduation rate.

School C is a private, independent, college preparatory school located in a suburban community with a population near 70,000. The demographics of the community include 82% white, 5% Asian and Hispanic, 4% African-American and other. The local school district is not as strong as what is found near School A and School B. The API at the nearby public high school was at 753 as of the 2011-12 school year along with an 83% graduation rate.

Lastly, School D is a private, independent school located in a nearby suburb to Los Angeles. It is officially located in a *neighborhood* of Los Angeles, but incorporated into the greater area of Los Angeles. With a population of over 3,800,000, half of the population is white, 11% Asian, 10% African-American, and 1% Other. With an API of 746, the local school district is the worst of the four high schools included in this study. It graduates only 66% of its high school students throughout the school district.

It must be noted that although School D possesses differing community demographics as opposed to the other schools in the study (see Table 1), the demographics within the school and the type of student attending School D is quite similar to those attending the other three schools. The demographic information is a bit misleading due to the fact that the school is located within the city limits of a large metropolitan city. The other three participant schools are each located in suburban towns thus skewing the demographic information (see Table 1).

Table 1

*Demographics of the Communities Surrounding Participant Schools*

| Demographics | School A | School B | School C | School D |
|---|---|---|---|---|
| Population | 8,000 | 21,000 | 55,000 | 3,884,307 |
| Average Home Price | $1,280,851 | $2,016,626 | $3,312,678 | $610,000 |
| White alone | 89% | 69% | 68% | 50% |
| American Indian and Alaska Native | 0% | 0% | 1% | 1% |
| Asian alone | 6% | 26% | 8% | 11% |
| Black or African American alone | 1% | 1% | 7% | 10% |
| Native Hawaiian and Other Pacific Islander | 0% | 0% | 0% | 0% |
| Two or More Races | 6% | 3% | 7% | 5% |
| Hispanic or Latino | 6% | 6% | 27% | 49% |
| White alone, not Hispanic or Latino | 84% | 65% | 54% | 29% |
| Local Public School Graduation Rate | 98% | 98% | 83% | 66% |
| Local Public School API | 881 | 942 | 753 | 746 |

*Note*. Adapted from the California Department of Education (http://www.cde.ca.gov/ds/), 2010

Within the four currently participating private high schools, 538 families of high school seniors were invited to complete the surveys: 241 from School A, 106 from School B, 122 from School C, and 69 from School D. With a 25-55% expected response rate (Cook, Heath & Thompson, 2000), it was expected that between 134 and 290 families would respond. Following the parent or guardian response, students were asked to participate in the study. With the same expected response rate, it was expected that between 34 and 160 students would respond to the survey.

**Human Subjects Considerations**

This study meets criteria for an Expedited Review based on Federal Guidelines, expedited procedures, category 7 (Office for Human Research Protection, 2010). The risks to subjects were minimal and the study was considered to be exempt research but for the fact that minors were involved in the process.

In a letter provided to students and their parents or legal guardians, specific information regarding the study was provided including what was being asked of them. This letter also asked for both parent consent and for participant assent (parents and students). It was explained to parent and student participants through this letter that they could have chosen not to be a part of the study, chosen not to answer any questions, and/or chosen to withdraw from the study at any time without any negative consequences. Participants were assured that data will be held confidentially. Through an electronic process, parents and students were matched through randomly created family codes without having to divulge any personal or revealing information.

For the purposes of ensuring confidentiality, the researcher did not use or disclose any identifiable or personal information. Within the study, only aggregate data was reported. Pseudonyms were used in place of school names, cities, and any other proper names. Codes were used throughout the study to substitute for the names of students and parents. Through the use of these codes, student data was be coded to match the data of their parents or guardians.

There were minimal risks to the student participants. For the students, the time and energy spent completing the survey may perhaps be a further contribution to the level of anxiety of which the student was already experiencing. There was also perhaps a risk of boredom. Since student participants' identity will not be shared with the school, no impact on grades would be possible.

For parent and guardian participants, because the survey took less than five minutes to complete, there were no foreseeable risks associated with this study. Parental participants were not being asked questions that have any bearing on employment, social status, or continued enrollment of their student in the school.

There were no direct benefits to participants. However, there were social benefits expected as a result of the study including a possible link between parent affiliations toward the fixed mindset vs. the growth mindset and their child's level of unhealthy academic anxiety. If a link was found, it may be possible to change parent mindsets thus decreasing the levels of unhealthy academic anxiety experienced by high school seniors.

Site approval was secured through permission from one of each school's key staff members prior to any data collection. Approval for the study was obtained from Pepperdine University's Graduate and Professional School's Institutional Review Board (IRB; see Appendix F). There was no deception of the participants planned for this study. Neither was there any remuneration for participants included within the study. There were no known conflicts of interest within the study.

**Data Collection Procedures**

The data collection procedures began with an invitation phase and lasted for a period of about four weeks. During this phase, an email was sent to all parents and guardians of high school seniors who attended one of the participating schools. The email sent to families contained a link to the parent survey specific to their school. When parents or guardians click on the link, they were be directed to a page that included personal assent and parent consent to allow their student to also participant to participate in the study. Once the personal assent and parent consent were electronically submitted, parents and guardians were directed to the short, six-item

survey. Following the completion of the survey, parents were given a family-specific code and link to the student survey. Parents were also given clear and concise directions as to how to allow their student to also participate in the study.

When students received the link and their family-specific code from their parent or guardian, they were directed to a website with a personal consent form. Once the student gave consent, he or she was directed to a student survey designed to take no longer than 30 minutes to complete.

During the data collection phase, one follow-up email was sent to all senior families and students as a reminder to complete the survey process.

**Variables of the Study**

Variables of the study include student and parent mindset as measured by the intelligence domain of the ITQ. This portion of the survey included four items using a five-point scale (strongly agree, agree, neutral, disagree, or strongly disagree). Another student variable of the study is the levels of anxiety as experienced by high school seniors during the college application process. This was measured by the STICSA. For the STICSA, respondents answered each question using a four-point scale (not at all, a little, moderately, very much so). Lastly, the remaining student variables of the study included each student's gender, race, current GPA, highest SAT score, highest ACT score, the number of colleges receiving applications from the student, and whether the student has applied to a highly selective school.

Table 2

*Study's Variables, Instruments, Sample, Number of Items, and Format of Items*

| Variable Name | Instrument Name | Sample | # of Items | Format of Item |
|---|---|---|---|---|
| Mindset | Intelligence Domain of the Implicit Theories Questionnaire (ITQ) | Students, Parents, and Guardians | 4 | 5-point scale |
| Anxiety | State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA) | Students | 42 | 4-point scale |
| Gender | Demographics | Students | 1 | Categorical |
| Race/Ethnicity | Demographics | Students | 2 | Categorical |
| GPA | Demographics | Students | 1 | Interval |
| ACT Score | Demographics | Students | 1 | Interval |
| SAT Score | Demographics | Students | 1 | Interval |
| # of Applications | Demographics | Students | 1 | Interval |
| Application to Highly Selective School | Demographics | Students | 1 | Categorical |

**Instrumentation**

Two surveys were used to gather data for the study, one designed for students and the other for parents. The student survey included 42 questions from the State-Trait Anxiety Inventory (Grös et al., 2007), four questions from the intelligence domain of the ITQ (Spinath et al., 2003), and demographic items including student gender, race, cumulative GPA, highest SAT score, highest ACT score, the number of colleges reciving applications from the student, and whether the student is intending to apply to a high selective college, university, or academy. The student survey was designed to take no more than 30 minutes to complete.

The parent or guardian survey contained six questions. Four questions were from the intelligence domain of the ITQ (Spinath et al., 2003) with the purpose of measuring the parent or guardian's mindset. Two questions were from the Ten Item Personality Survey (TIPI; Gosling et al., 2003) to measure the parent or guardian's emotional stability. The parent/guardian survey was designed to take less than five minutes to complete.

**The Intelligence Domain of the Implicit Theories Questionnaire**. The ITQ (Spinath et al., 2003) is closely aligned to Dweck's (1995) original implicit theories scale but is adapted to allow implicit theories to be tested to gain understanding of self-theories not only regarding intelligence, but also in areas such as one's personality, specific abilities, athletic abilities, and mathematical abilities. The complete questionnaire, in its entirety, consists of 32 items, each answered on a five-point scale (1=strongly agree; 5=strongly disagree; Spinath et al., 2003). However, due to the focus and purpose of this study, only questions relating to one's intellect will be used.

Data was analyzed for the ITQ as part of a larger study that took place throughout Germany in 1997 through the University of Bielefeld. There were two studies, the first of which took place through a self-assessment study taken from home by 964 pairs of twins. The second study consisted of 400 pairs of twins who spent a day at the university completing several tests gathering data on intelligence and personality. Through the resulting analysis of the ITQ, the reliability of the general traits, including the intelligence domain, has been determined to have a coefficient alpha value of .89 ($N$=592) (Spinath et al., 2003). For this present study, Cronbach's Alpha was found to be 0.70 ($N$=121) which is an acceptable level for instrument reliability (Creswell, 2013).

Table 3

*Intelligence Domain Items of the Implicit Theories Questionnaire (ITQ) for the Parent Survey*

| Item | Scoring |
|---|---|
| 1. How intelligent you are is hardly or not at all changeable by yourself. | Strongly Agree = 1; Agree = 2; Neutral = 3; Disagree = 4; Strongly Disagree = 5 |
| 2. How intelligent you are depends mainly on your own effort. | Strongly Agree = 5; Agree = 4; Neutral = 3; Disagree = 2; Strongly Disagree = 1 |
| 3. How intelligent you are cannot be influenced by yourself. | Strongly Agree = 1; Agree = 2; Neutral = 3; Disagree = 4; Strongly Disagree = 5 |
| 4. If someone is not very intelligent as a child, he or she cannot be very intelligent as an adult even if he or she tries to. | Strongly Agree = 1; Agree = 2; Neutral = 3; Disagree = 4; Strongly Disagree = 5 |

*Note.* In the above table, Item 2 is designed to be reverse coded and will therefore be scored in a reverse manner.

For both the student survey and the parent survey, the questions from the intelligence domain of the Implicit Theories Questionnaire will be used to analyze the mindsets of the various participants. Three of the four items will be coded as follows: 1 = strongly agree; 2 = agree; 3 = neutral; 4 = disagree; and 5 = strongly agree. One item is reverse coded and will therefore be coded in a reverse manner(see Table 4). The total values of the four items regarding mindset will range between 4 and 16. The higher the total value indicates the greater the growth mindset of the particular individual.

Table 4

*Intelligence Domain Items of the Implicit Theories Questionnaire (ITQ) for the Student Survey*

| Item | Scoring |
|---|---|
| 1. How intelligent you are is not at all changeable by yourself. | Strongly Agree = 1; Agree = 2; Neutral = 3; Disagree = 4; Strongly Disagree = 5 |
| 2. How intelligent you are depends mainly on your own effort. | Strongly Agree = 5; Agree = 4; Neutral = 3; Disagree = 2; Strongly Disagree = 1 |
| 3. You cannot influence how intelligent you are. | Strongly Agree = 1; Agree = 2; Neutral = 3; Disagree = 4; Strongly Disagree = 5 |
| 4. If someone is not very intelligent as a child, he or she cannot be very intelligent as an adult even if he or she tries to. | Strongly Agree = 1; Agree = 2; Neutral = 3; Disagree = 4; Strongly Disagree = 5 |

*Note.* In the above table, Item 2 is design to be reverse coded and will therefore be scored in a reverse manner. Additionally, the wording of Item 1 and Item 3 have been altered slightly as appropriate to the age of the participants taking the student survey.

**The Emotional Stability Domain of the Ten-Item Personality Inventory**. The Ten-Item Personality Inventory (TIPI; Gosling et al., 2003) was designed to measure the *Big-Five* personality dimension especially when a particular survey or instrument requires fewer items. The Big-Five framework, the most widely used and researched personality model, includes five dimensions: extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience. These dimensions are measured using ten items, two items per dimension (Gosling et al., 2003).

For this particular study, the two items from TIPI were included within the parent or guardian survey to measure the specific dimension of emotional stability. The purpose of including these questions was to control for the genetic contribution to personality, in particular to those who are perhaps predisposed to higher levels of anxiety (Digman, 1990). The convergent correlation between these two items from TIPI and the items measuring emotional stability within the highly reliable Big-Five Inventory (BFI; John & Srivastava, 1999) was

measured to be .81 (*N* = 1,813). In an earlier study, the BFI was found to have a coefficient alpha reliability of .83 (John & Srivastava, 1999). For this particular study, the Cronbach's Alpha measure of reliability was 0.75 (*N*=95), an acceptable level for instrument reliability (Creswell, 2013).

Table 5

*TIPI Items (Emotional Stability Domain), Scoring, and Type of Anxiety Measured*

| Item | Scoring |
|---|---|
| 1. I see myself as anxious, easily upset | Agree strongly = 1; Agree moderately = 2; Agree a little = 3; Neither agree or disagree = 4; Disagree a little = 5; Disagree moderately = 6; Disagree strongly = 7 |
| 2. I see myself as calm, emotionally stable | Agree strongly = 7; Agree moderately = 6; Agree a little = 5; Neither agree or disagree = 4; Disagree a little = 3; Disagree moderately = 2; Disagree strongly = 1 |

**The State-Trait Inventory for Cognitive and Somatic Anxiety**. STICSA was designed to assess symptoms of anxiety as they relate to both the current state of an individual as well as the general trait of an individual. There are two parts to this inventory. The first part is entitled *Your Mood at This Moment* and seeks to measure levels of acute anxiety. The second part, *Your General Mood State*, seeks to measure levels of chronic anxiety. Both parts consist of 21 questions each totaling 42 questions for the entire inventory. Respondents answer each question using a scale that includes the following responses: *not at all*; *a little*; *moderately*; and *very much so*.

The STICSA also distinguishes between somatic anxiety (i.e. hyperventilation, palpitations, muscle tension) and cognitive anxiety (i.e. worry, intrusive thoughts, inability to concentrate; Ree, French, MacLeod & Locke, 2008). Research suggests somatic anxiety and

cognitive anxiety are distinguishable for both acute anxiety and chronic anxiety (Ree et al., 2008).

The STICSA instrument originally began with 131 questions each designed to measure symptoms of anxiety. The selection of the final 42 questions was a result of the review of an expert panel as well as the data collection from patients ($N = 567$) experiencing anxiety disorder (Grös et al., 2007). Analysis of the final inventory revealed a coefficient of determination of 0.94. The reliability coefficent was 0.84 for the items designed for the somatic factor and 0.87 for the items designed for the cognitive factor (Ree et al., 2008). For this study, the reliability coefficient of STICSA using Cronbach's Alpha was 0.99 ($N$=26) a high level of instrument reliability (Creswell, 2013).

Student anxiety was measured using the STICSA. For the data from survey items extracted from the STICSA, each item response was coded as follows: 1 = not at all; 2 = a little; 3 = moderately; and 4 = very much so. The STICSA measured both the acute stress and chronic stress of an individual. Each subset is scored between 21 and 84. The higher numbers represent higher levels of the respective type of anxiety. Each of the subsets will be analyzed separately (acute, chronic, somatic, and cognitive). In addition, responses to items were coded and combined to create a general anxiety score.

Table 6

*STICSA Items, Scoring, and Type of Anxiety Measured*

| Item | Scoring | Type of Anxiety Measured |
|---|---|---|
| 1. My heart beats fast | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Somatic |
| 2. My muscles are tense | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Somatic |
| 3. I fell agonized over my problems | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Cognitive |
| 4. I think that others won't approve of me | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Cognitive |
| 5. I feel like I'm missing out on things because I can't make up my mind soon enough | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Cognitive |
| 6. I feel dizzy | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Cognitive |
| 7. My muscles feel weak | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Somatic |
| 8. I feel trembly and shaky | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Cognitive |
| 9. I picture some future misfortune | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Cognitive |
| 10. I can't get some thought out of my mind | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Cognitive |
| 11. I have trouble remembering things | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Cognitive |

(continued)

| Item | Scoring | Type of Anxiety Measured |
|---|---|---|
| 12. My face feels hot | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Somatic |
| 13. I think that the worst will happen | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Cognitive |
| 14. My arms and legs feel stiff | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Somatic |
| 15. My throat feels dry | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Somatic |
| 16. I keep busy to avoid uncomfortable thoughts | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Cognitive |
| 17. I cannot concentrate without irrelevant thoughts Cognitive intruding | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Cognitive |
| 18. My breathing is fast and shallow | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Somatic |
| 19. I worry that I cannot control my thoughts as well as I would like to | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Cognitive |
| 20. I have butterflies in the stomach | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Cognitive |
| 21. My palms feel clammy | Not at all = 1; A little = 2; Moderately = 3; Very much so = 4 | Somatic |

*Note.* This table includes the 21 items from STICSA, all of which will be included on the student survey. Students will be asked to answer each of these items twice; the first time, students will respond to each of the items through an acute lens ("During the college application process…"), and the second time, students will respond to each of the items through the chronic lens ("In general…"). This table also includes the possible item responses as well as the scoring assigned to each of the item responses.

**Demographic items**. The remaining variables from the student survey were either nominal (gender, race, religious, and application to a highly selective college) or ordinal (GPA, SAT scores, ACT scores, the number of applications completed) in nature. For the items measuring nominal data, students were given appropriate choices. For items measuring ordinal data, students were provided a blank space in which to type in the correct answer.

**Pilot of instruments**. Prior to the collection of data, a pilot of the instrument took place. There were two purposes for piloting the instrument. First, due to the instrument being in an electronic format, the pilot ensured the ability to be read and used properly by all participants. Second, with two separate surveys and the necessity of combining parent/guardian surveys with student surveys, the pilot also ensured the data from both surveys were properly linked. Consenting adults completed the pilot instrument.

**Data Preparation and Analysis**

Raw data was obtained from parents, guardians, and students online through *Qualtrics*. Data was stored in *Qualtrics* and was password-protected. The data obtained through *Qualtrics* was checked for completeness prior to being analyzed via SPSS, an IBM software package used for data analysis.

Initial analysis of the data began with descriptive statistics. The means, medians, standard deviations, and general trends represented in the data was established, including the data regarding student mindset, parent mindset, student anxiety, student acute anxiety, student chronic anxiety, gender of participants, student GPAs, SAT scores, ACT scores, and the number of participants applying to highly selective colleges, universities, and academies. This portion of the analysis also included frequency distributions for each of the surveys' items (see Table 7).

Table 7

*Study's Variables and Analysis Procedures*

| Variable Name | Analysis Procedures |
|---|---|
| Mindset | • Item analysis<br>• Frequency distribution<br>• Scores<br>• Measures of central tendency<br>• Measures of dispersion |
| Anxiety | • Item analysis<br>• Frequency distribution<br>• Scores<br>• Measures of central tendency<br>• Measures of dispersion |
| Gender | • Frequency distribution |
| Race/Ethnicity | • Frequency distribution |
| GPA | • Item analysis<br>• Frequency distribution<br>• Measures of central tendency<br>• Measures of dispersion |
| ACT Score | • Item analysis<br>• Frequency distribution<br>• Measures of central tendency<br>• Measures of dispersion |
| SAT Score | • Item analysis<br>• Frequency distribution<br>• Measures of central tendency<br>• Measures of dispersion |
| # of Applications | • Item analysis<br>• Frequency distribution<br>• Measures of central tendency<br>• Measures of dispersion |
| Application to Highly Selective School | • Frequency distribution<br>• Mode |

Table 8

*Research Questions and Procedures*

| Research Questions | Procedures | Sources of Data |
|---|---|---|
| 1) What relationship exists, if any, between the mindset of a college-preparatory high school senior and their levels of experienced academic anxiety during the college application process? | • Correlational Procedures to measure relationships | • Student Survey items 1-4 (ITQ)<br>• Student Survey items 5-46 (STICSA) |
| 2) What relationship exists, if any, between the mindset of a parent and the levels of academic anxiety as experienced by their college-preparatory high school senior during the college application process? | • Correlational Procedures to measure relationships | • Parent Survey items 1-4 (ITQ)<br>• Student Survey items 5-46 (STICSA) |
| 3) What relationship exists between the mindset of a college-preparatory high school senior and their parent's or guardian's mindset? | • Correlational Procedures to measure relationships | • Parent Survey items 1-4 (ITQ)<br>• Student Survey items 1-4 (ITQ) |
| 4) Are there differences in student mindset, parent mindset, or student anxiety based on selected demographic variables? | • Analysis of Variance<br>• t-Test | • Parent Survey items 1-4 (ITQ)<br>• Student Survey items 1-54 (ITQ; STICSA; Demographics) |

To answer the research questions, correlational statistic procedures were used to determine relationships among each variable. These variables included the parent mindset scores, the parent emotional stability scores, the student mindset scores, and the student anxiety scores (see Table 8).

With the purpose of ensuring internal validity within the study, several methods will be employed. First, because the variables within the study were known due to prior studies, the

quantitative approach was the best choice. Second, valid and reliable instruments were used within the study to capture necessary data. Third, appropriate statistical measurements were utilized with the purpose of answering the research questions.

## Chapter 4: Results

Following an invitation from the researcher, four private, independent, college-preparatory high schools from southern California agreed to participate in this study. Each of the four schools agreed to allow email invitations to be sent to the parents or guardians of each of their current seniors. In total, families of 538 high school seniors received invitations to participate in this study: 241 from School A, 106 from School B, 122 from School C, and 69 from School D. In total, there were 95 parents who completed the entirety of the parent survey (Mindset and TIPI): 46 were from School A, 33 were from School B, 10 were from School C, and 7 were from School D. Therefore, 18% of the total number of parent or guardian participants completed the parent survey (see Table 9).

For students to be able to complete the survey, it was necessary for the parents to first complete their survey. Therefore, there were 95 possible student participants. In total, there were 26 students who completed the entirety of the student survey, resulting in a 27% response rate among possible student participants. The school totals of student respondents are as follows: 13 were from School A, 11 were from School B, 1 was from School C, and 1 was from School D (see Table 9).

Table 9

*Number of Parent and Student Participants*

| School | Total Number of Seniors | Parent Participants | Parent % | Student Participants | Student % |
|---|---|---|---|---|---|
| School A | 241 | 46 | 19% | 13 | 28% |
| School B | 106 | 33 | 31% | 11 | 33% |
| School C | 122 | 10 | 8% | 1 | 10% |
| School D | 69 | 7 | 10% | 1 | 14% |
| Total | 538 | 95 | 18% | 26 | 27% |

As mentioned, the survey collected basic demographic information from each of the student participants. Of the 26 student participants, 19 were female, 6 were male, and one chose not to indicate their gender (see Table 10). As far as race and ethnicity, 20 were White, 1 was Black or Negro, 1 was Chinese, 2 were Filipino, and 2 chose not to indicate their ethnicity. Students were also asked about their Spanish origin. Of the participants, 18 were not Hispanic, 2 were Mexican, Mexican American, or Chicano, 1 was Puerto Rican, 3 were of another Hispanic origin, and 2 chose not to answer this question (see Table 10)

Table 10

*Demographics of Student Participants*

| | | | | | |
|---|---|---|---|---|---|
| | Male Students | Female Students | | | No Answer |
| Gender | 6 | 19 | | | 1 |
| | White | Black or African, | Chinese | Filipino | No Answer |
| Race | 20 | 1 | 1 | 2 | 2 |
| | Not Hispanic | Mexican, Mexican American, Chicano | Puerto Rican | Other Hispanic | No Answer |
| Spanish Origin | 18 | 2 | 1 | 3 | 2 |

*Note.* $N = 26$

The analysis of the collected data sought to answer the following research questions guiding the study:

1. To what extent, if at all, is there a relationship between the mindset of a college-preparatory high school senior and the levels of academic anxiety experienced during the college application process?
2. To what extent, if at all, is there a relationship between the mindset of parents and the levels of academic anxiety experienced by their student during the college application process?
3. What relationship exists, if any, between the mindset of a college-preparatory high school

senior and their parent's or guardian's mindset?

4. Are there differences in the mindset of high school seniors attending college-preparatory, private, independent schools, the mindset of their parents/guardians, or their levels of anxiety based on selected demographic variables?

**Results**

There were a total of three item analyses completed for this study. First, an item analysis was completed using the sum of all parent/guardian participants ($N = 95$). Throughout the study, this grouping will be referred to as the "Parent/Guardian Total Participants" (TP). Second, an item analysis was completed using just the data from the parent/guardian participants whose student also completed the student survey ($N = 26$), a grouping referred to in this study as the "Parent/Guardian Subgroup Participants" (SP). Lastly, a third item analysis was completed using the data collected from the student surveys.

**Item analysis of the parent survey**. Two item analyses were completed for the parent survey, once for the Parent/Guardian Total Participants (TP) and once for the Parent/Guardian Subgroup Participants (SP). Both item analyses include the 4 items from the Intelligence Domain of the ITQ (Spinath et al., 2003) and the 2 items measuring Emotional Stability from the TIPI (Gosling et al., 2003). The item analysis will first be reported for the TP ($N = 95$), followed by the analysis of the SP—those parent or guardian participants with coinciding student participation ($N = 26$).

***Parent Mindset***. The Parent Survey included four items from the Intelligence Domain of the ITQ with the purpose of measuring the mindset of parents. The four items were the following statements:

1. How intelligent you are is hardly or not at all changeable by yourself.

2. How intelligent you are depends mainly on your own effort.
3. How intelligent you are cannot be influenced by yourself.
4. If someone is not very intelligent as a child, he or she cannot be very intelligent as an adult, even if he or she tries to.

For each of these four statements, participants were asked to state their level of agreement using only the five following responses: Strongly Agree, Agree, Neutral, Disagree, or Strongly Disagree. Item two was reverse coded compared to the other items from the ITQ (see Table 11). A higher score for each item represents a stronger growth mindset.

Table 11

*Intelligence Domain Items of the Implicit Theories Questionnaire (ITQ) for the Parent Survey*

| Item | Scoring |
|---|---|
| 5. How intelligent you are is not at all changeable by yourself. | Strongly Agree = 1; Agree = 2; Neutral = 3; Disagree = 4; Strongly Disagree = 5 |
| 6. How intelligent you are depends mainly on your own effort. | Strongly Agree = 5; Agree = 4; Neutral = 3; Disagree = 2; Strongly Disagree = 1 |
| 7. You cannot influence how intelligent you are. | Strongly Agree = 1; Agree = 2; Neutral = 3; Disagree = 4; Strongly Disagree = 5 |
| 8. If someone is not very intelligent as a child, he or she cannot be very intelligent as an adult even if he or she tries to. | Strongly Agree = 1; Agree = 2; Neutral = 3; Disagree = 4; Strongly Disagree = 5 |

The Parent/Guardian group ($N = 95$) showed a small amount of variation among the four items (see Table 12). Items three *(ability to influence intelligence*) and four (*changing intelligence from childhood to adult*) had the highest mean scores (M = 3.98) indicating a growth mindset in these areas. Item one (*intelligence can be changed*) showed a slightly lower mean score (M = 3.66) but the same median and mode as Items three and four. Item two referring to

*intelligence depending on effort* showed a mean score of 2.81 and a median and mode of three indicating a lower mindset score though still above the median point on the overall 5.0 scale.

Table 12

*Central Tendency of Intelligence Design items from the Implicit Theories Questionnaire of the Parent Survey for Parent/Guardian Total Participants*

| | *Item 1* | *Item 2* | *Item 3* | *Item 4* |
|---|---|---|---|---|
| Mean | 3.66 | 2.81 | 3.98 | 3.98 |
| Median | 4.00 | 3.00 | 4.00 | 4.00 |
| Mode | 4.0 | 2.0 | 4.0 | 4.0 |
| Standard Deviation | .99 | 1.11 | .92 | .85 |
| Range | 4.0 | 4.0 | 4.0 | 4.0 |

*Note.* $N = 95$

For the Parent/Guardian Subgroup ($N = 26$), a different pattern emerged. All 4 items had median scores of 4.0 with mean scores ranging from 3.35 to 4.15. Items 3 and 4 continued to have the highest mean scores for the subgroup and Item 2 had the lowest (see Table 13).

Table 13

*Central Tendency of Intelligence Design Items from the Implicit Theories Questionnaire of the Parent Survey for Parent/Guardian Subgroup Participants*

| | *Item 1* | *Item 2* | *Item 3* | *Item 4* |
|---|---|---|---|---|
| Mean | 3.81 | 3.35 | 4.04 | 4.15 |
| Median | 4.0 | 4.0 | 4.0 | 4.0 |
| Mode | 4.0 | 4.0 | 4.0 | 4.0 |
| Standard Deviation | .85 | 1.09 | .87 | .46 |
| Range | 4.0 | 4.0 | 4.0 | 2.0 |

*Note.* $N = 26$

*Item 1: "How intelligent you are is hardly or not changeable by yourself".* In reviewing the frequency distributions between the total parent group and the subgroup, the highest percentage of subjects for each group *Disagreed* with the item about intelligence not being changeable. There were also similar percentage of subjects who chose a *Neutral* position on this item. The most variation of parent response occurred for those who *Agreed* with the item

(TP=16% and SP=4%) and also for those parents who took the *Strongly Disagreed* position (see Table 14).

Table 14

*Item #1: How Intelligent You are is Hardly or Not at All Changeable by Yourself.*

| | Parent/Guardian Total Participants (TP) (N=95) | | Parent/Guardian Subgroup Participants (SP) (N=26) | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| Strongly Agree | 2 | 2.1 | 1 | 3.8 |
| Agree | 15 | 15.8 | 1 | 3.8 |
| Neutral | 11 | 11.6 | 3 | 11.5 |
| Disagree | 53 | 55.8 | 18 | 69.2 |
| Strongly Disagree | 14 | 14.7 | 3 | 11.5 |
| Total | 95 | 100.0 | 26 | 100.0 |

*Item 2: How intelligent you are depends mainly on your own effort*. In reviewing the frequency distributions between the parent/guardian total participants and the subgroup with the subgroup participants, there were similar distributions for those with the position of *Strongly Disagree* (TP=8.4 and SP=3.8), *Neutral* (TP=21.1 and SP=19.2), as well as *Strongly Agree* (TP=7.4 and SP=11.5). However, there was a widespread difference between those with the position of *Disagreed* (TP=40.0 and SP=23.1) and *Agreed* (TP=23.2 and SP=42.3; see Table 15).

*Item 3: How intelligent you are cannot be influenced by yourself.* For this item, the frequency distribution of responses was fairly similar between TP and SP. For both groups, the largest difference was of those who said they *Agree* with this statement (TP=5.3 and SP=0). There was very little difference between the groups who answered *Neutral* (TP=8.4 and SP=11.5), *Disagree* (TP=56.8 and 57.7) and *Strongly Disagree* (TP=26.3 and SP=26.0; see Table 16).

Table 15

*Item #2: How Intelligent You are Depends Mainly on Your Own Effort.*

| | Parent/Guardian Total Participants (TP) | | Parent/Guardian Subgroup Participants (SP) | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| Strongly Disagree | 8 | 8.4 | 1 | 3.8 |
| Disagree | 38 | 40.0 | 6 | 23.1 |
| Neutral | 20 | 21.1 | 5 | 19.2 |
| Agree | 22 | 23.2 | 11 | 42.3 |
| Strongly Agree | 7 | 7.4 | 3 | 11.5 |
| Total | 95 | 100.0 | 26 | 100.0 |

Table 16

*Item #3: How Intelligent You are Cannot be Influenced by Yourself.*

| | Parent/Guardian Total Participants (TP) | | Parent/Guardian Subgroup Participants (SP) | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| Strongly Agree | 3 | 3.2 | 1 | 3.8 |
| Agree | 5 | 5.3 | 0 | 0 |
| Neutral | 8 | 8.4 | 3 | 11.5 |
| Disagree | 54 | 56.8 | 15 | 57.7 |
| Strongly Disagree | 25 | 26.3 | 7 | 26.9 |
| Total | 95 | 100.0 | 26 | 100.0 |

*Item 4: If someone is not very intelligent as a child, he or she cannot be very intelligent as an adult, even if he or she tries to.* Once again, most of the parents in both groups responded in a manner that is reflective of a growth mindset. Very few, if any, parents responded either with a *Strongly Agree* (TP=2.1 and SP=0) or *Agree* (TP=4.2 and SP=0) to this statement. With the majority of parents responding either with *Disagree* or *Strongly Disagree*, the greatest

difference between the two groups was that a much higher percentage of SP responded with *Disagree* (TP=57.9 and SP=76.9; see Table 17).

Table 17

*Item #4: If Someone is not very Intelligent as a Child, He or She Cannot be very Intelligent as an Adult, Even if He or She Tries to.*

| | Parent/Guardian Total Participants (TP) | | Parent/Guardian Subgroup Participants (SP) | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| Strongly Agree | 2 | 2.1 | 0 | 0 |
| Agree | 4 | 4.2 | 0 | 0 |
| Neutral | 11 | 11.6 | 1 | 3.8 |
| Disagree | 55 | 57.9 | 20 | 76.9 |
| Strongly Disagree | 23 | 24.2 | 5 | 19.2 |
| Total | 95 | 100.0 | 26 | 100.0 |

***Emotional Stability of Parent/Guardian*.** In addition to the 4 items from the Intelligence Domain of the ITQ (Spinath et al., 2003), the Parent Survey also included two items from the TIPI (Gosling et al., 2003) to measure the emotional stability of the parent/guardian. Each of the items ask the participant whether they agree or disagree with a statement about their own personality. The two items on the survey are as follows: *I see myself as anxious, easily upset*, and *I see myself as calm, emotionally stable*.

Respondents are asked to select the level of agreement that most accurately depicts their personality as it relates to each of these statements (agree strongly, agree moderately, agree a little, neither agree nor disagree, disagree a little, disagree moderately, or disagree strongly). The higher TIPI score indicates a greater degree of emotional stability (see Table 18).

As previous, the item analysis will first be reported for the TP ($N = 95$), followed by the analysis of the SP—those parent/guardian participants with coinciding student participation ($N = 26$).

Table 18

*TIPI Items (Emotional Stability Dimension), Scoring, and Type of Anxiety Measured*

| Item | Scoring |
|---|---|
| 3. I see myself as anxious, easily upset | Agree strongly = 1; Agree moderately = 2; Agree a little = 3; Neither agree or disagree = 4; Disagree a little = 5; Disagree moderately = 6; Disagree strongly = 7 |
| 4. I see myself as calm, emotionally stable | Agree strongly = 7; Agree moderately = 6; Agree a little = 5; Neither agree or disagree = 4; Disagree a little = 3; Disagree moderately = 2; Disagree strongly = 1 |

The Parent/Guardian TP group ($N = 95$) and the SP group ($N = 26$) showed very little amount of variation among Item 5 *(anxious, easily upset*; TP=4.52 and SP=4.62) and Item 6 (*calm, emotionally stable*; TP=2.44 and SP=2.27; see Table 10). Although similar, the results reflect a TP group slightly more anxious and easily upset (TP=4.52 and SP=4.62) but also a bit more calm and emotionally stable (TP=2.44 and SP=2.27). The median and mode were the same for both groups for both items. The standard deviation was similar for Item 5 (TP=1.86 and SP=1.75) and for Item 6 (TP=1.35 and SP=1.15). Although the range was consistent for Item 5 and 6 (6.0), there was a more narrow range on Item 6 for the SP (TP=6.0 and SP=4.0; see Table 19).

Table 19

*Central Tendency of Emotional Stability items from the Ten Item Personality Inventory of the Parent Survey for Parent/Guardian Total Participants (N = 95)*

| | *Parent/Guardian Total Participants (N = 95)* | | *Parent/Guardian Subgroup Participants (N = 26)* | |
|---|---|---|---|---|
| | *Item #5* | *Item #6* | *Item #5* | *Item #6* |
| Mean | 4.52 | 2.44 | 4.62 | 2.27 |
| Median | 5.00 | 2.00 | 5.00 | 2.00 |
| Mode | 3.0 | 2.0 | 3.0 | 2.0 |
| Std. Deviation | 1.86 | 1.35 | 1.75 | 1.15 |
| Range | 6.0 | 6.0 | 6.0 | 4.0 |

*Item 5: I see myself as anxious, easily upset.* In reviewing the frequency distributions between the TP and the SP, the highest percentage of subjects for each group responded they *Agree a little* with seeing themselves as "anxious, easily upset" (TP=29.5 and SP=30.8) followed by the second largest response, *Disagree moderately* (TP=24.2 and SP=23.1). There were two responses that widely differed between TP and SP. The TP had a higher percentage of respondents answer *Agree moderately* (TP=12.6 and SP=3.8) while SP had a higher percentage of respondents answer *Disagree a little* (TP=10.5 and SP=19.2; see Table 20).

Table 20

*Item #5: I See Myself as Anxious, Easily Upset.*

| | Parent/Guardian Total Participants (TP) | | Parent/Guardian Subgroup Participants (SP) | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| Agree strongly | 2 | 2.1 | 1 | 3.8 |
| Agree moderately | 12 | 12.6 | 1 | 3.8 |
| Agree a little | 28 | 29.5 | 8 | 30.8 |
| Neither agree nor disagree | 3 | 3.2 | 1 | 3.8 |
| Disagree a little | 10 | 10.5 | 5 | 19.2 |
| Disagree moderately | 23 | 24.2 | 6 | 23.1 |
| Disagree strongly | 17 | 17.9 | 4 | 15.4 |
| Total | 95 | 100.0 | 26 | 100.0 |

*Item 6: I see myself as calm, emotionally stable.* Review of the frequency distribution for Item 6 reveals more TP responded in neutral fashion ("Neither agree nor disagree") than SP (TP=6.3 and SP=0). The highest percentage for both groups answered *Agree moderately* (TP=44.2 and SP=57.7) and *Agree strongly* (TP=23.2 and SP=19.2), although it is important to note the data reflects the TP group saw themselves more strongly as *calm, emotionally stable* (see Table 21).

Table 21

*Item #6: I See Myself as Calm, Emotionally Stable.*

| | Parent/Guardian Total Participants (TP) | | Parent/Guardian Subgroup Participants (SP) | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| Agree strongly | 22 | 23.2 | 5 | 19.2 |
| Agree moderately | 42 | 44.2 | 15 | 57.7 |
| Agree a little | 13 | 13.7 | 3 | 11.5 |
| Neither agree nor disagree | 6 | 6.3 | 0 | 0 |
| Disagree a little | 10 | 10.5 | 3 | 11.5 |
| Disagree moderately | 1 | 1.1 | 0 | 0 |
| Disagree strongly | 1 | 1.1 | 0 | 0 |
| Total | 95 | 100.0 | 26 | 100.0 |

**Score Analysis of Parent Survey**. Two previously researched tools were contained within the parent survey—the Intelligence Domain of the ITQ (Spinath et al., 2003) and the Emotional Stability Domain from the TIPI (Gosling et al., 2003). The scores were compiled for each of these domains and will be reported below, first for the Parent/Guardian Total Participants and second for the Parent/Guardian Subgroup Participants.

***Intelligence Domain of the ITQ***. For the Intelligence Domain of the ITQ, a higher total score correlates with a growth mindset with possible scores ranging from 4 to 20. Conversely, the lower total score correlates with a fixed mindset.

In review of the descriptive statistics for the ITQ, the SP (N=26) had a higher score (M=15.35) indicating a stronger growth mindset versus the TP (M=14.42). The Median also indicates a stronger growth mindset among SP (TP=15.0 and SP=16.0). Lastly, the standard deviation and range was smaller among the SP (see Table 22).

Table 22

*Descriptive Statistics of the Intelligence Domain (ITQ) for Parent/Guardian Total Participants (TP) (N=95) and Subgroup Participants (SP) (N=26)*

| | TP | SP |
|---|---|---|
| Mean | 14.42 | 15.35 |
| Median | 15.00 | 16.00 |
| Mode | 16 | 16 |
| Std. Deviation | 2.63 | 2.04 |
| Range | 16 | 9 |

*Note.* Total Participants (*N* = 95); Subgroup Participants (*N* = 26)

Table 23

*Frequency Distribution of Intelligence Domain (ITQ) for Parent/Guardian Total Participants (TP) and Subgroup Participants (SP)*

| | Parent/Guardian Total Participants (TP) | | Parent/Guardian Subgroup Participants (SP) | |
|---|---|---|---|---|
| Intelligence Domain (ITQ) Scores | Frequency | Percent | Frequency | Percent |
| 4 | 1 | 1.1 | 0 | 0 |
| 8 | 2 | 2.1 | 0 | 0 |
| 9 | 1 | 1.1 | 0 | 0 |
| 10 | 2 | 2.1 | 0 | 0 |
| 11 | 4 | 4.2 | 1 | 3.8 |
| 12 | 9 | 9.5 | 2 | 7.7 |
| 13 | 8 | 8.4 | 2 | 7.7 |
| 14 | 20 | 21.1 | 3 | 11.5 |
| 15 | 13 | 13.7 | 1 | 3.8 |
| 16 | 21 | 22.1 | 13 | 50.0 |
| 17 | 7 | 7.4 | 2 | 7.7 |
| 18 | 1 | 1.1 | 0 | 0 |
| 19 | 3 | 3.2 | 1 | 3.8 |
| 20 | 3 | 3.2 | 1 | 3.8 |
| Total | 95 | 100.0 | 26 | 100.0 |

Of a scale between 4 and 20, the mean for the Intelligence Domain scale is 12. The review of the frequency distribution from the parent survey reveals 20.1% of TP scored a 12 or lower, indicating a fixed mindset. In contrast, 11.5% of SP scored a 12 or lower on the scale indicating a strong fixed mindset among TP. The vast majority of parent participants scored

between 14 and 16 (TP=56.9% and SP=65.3%). It is important to note that 50% of SP had an Intelligence Domain score of 16 versus 21.1% of TP, once again indicating a stronger growth mindset among SP (see Table 23).

*Emotional Stability Scores (TIPI)*. The second tool included in the Parent Survey was the Emotional Stability Domain from the Ten Item Personality Inventory (TIPI; Gosling et al., 2003). Possible score results include a total of 13 possible scores, ranging from 2 to 14. The higher scores on this spectrum indicate a greater tendency toward emotional stability and conversely, the lower scores indicate a greater tendency toward emotional instability.

The mean scores for TP (M=10.07) and SP (M=10.35) were fairly consistent, as was the median (TP and SP=11.0), standard deviation (TP=2.91 and SP 2.53), and range (TP=12 and SP=10). There was only a slight difference between modes with TP having a mode of 12 and SP having a mode of 11. This indicates a slightly more emotionally stable TP versus just those in the SP (see Table 24).

Table 24

*Descriptive Statistics of Emotional Stability Scores for Parent/Guardian Total Participants (TP) and Parent/Guardian Subgroup Participants (SP)*

| | TP | SP |
|---|---|---|
| Mean | 10.07 | 10.35 |
| Median | 11.00 | 11.00 |
| Mode | 12 | 11 |
| Std. Deviation | 2.91 | 2.53 |
| Range | 12 | 10 |

Table 25

*Frequency Distribution of Emotional Stability Scores for Total Participants (TP) and Subgroup Participants (SP)*

| | Parent/Guardian Total Participants (TP) | | Parent/Guardian Subgroup Participants (SP) | |
|---|---|---|---|---|
| Emotional Stability Scores | Frequency | Percent | Frequency | Percent |
| 3 | 2 | 2.1 | 0 | 0 |
| 4 | 1 | 1.1 | 1 | 3.8 |
| 5 | 4 | 4.2 | 0 | 0 |
| 6 | 6 | 6.3 | 2 | 7.7 |
| 7 | 7 | 7.4 | 1 | 3.8 |
| 8 | 10 | 10.5 | 1 | 3.8 |
| 9 | 8 | 8.4 | 3 | 11.5 |
| 10 | 9 | 9.5 | 3 | 11.5 |
| 11 | 10 | 10.5 | 6 | 23.1 |
| 12 | 16 | 16.8 | 3 | 11.5 |
| 13 | 10 | 10.5 | 5 | 19.2 |
| 14 | 12 | 12.6 | 1 | 3.8 |
| Total | 95 | 100.0 | 26 | 100.0 |

With a range of 12 and answers varying between 3 and 14, the score median separates scores 3 to 8 and 9 to 14. With this in mind, it can be determined that both TP and SP had a higher percentage of participants answer above the score median. A higher percentage of SP (80.6%) had a score between 9 and 14 when contrasted with TP (68.3%). However, with that being said, a higher percentage of TP had the highest possible score of 14 (TP=12.6% and SP=3.8%; see Table 25).

**Item Analysis of the Student Survey.** The Student Survey included 3 main sections. First, similar to the Parent Survey, the Student Survey included the Intelligence Domain of the ITQ to measure the student mindset. Second, the survey included an in depth measure of their levels of anxiety. The instrument used was the STICSA, which measures state anxiety, trait anxiety, cognitive anxiety, and somatic anxiety. Lastly, the Student Survey included a section to

gather demographic information about the student, including gender, origin, race, ACT and SAT scores, GPA, and the number of colleges to which they applied.

***Student Mindset***. The Student Survey included four items from the Intelligence Domain of the ITQ with the purpose of measuring the mindset of student participants. The four items were the following statements:

1. How intelligent you are is hardly or not at all changeable by yourself.
2. How intelligent you are depends mainly on your own effort.
3. How intelligent you are cannot be influenced by yourself.
4. If someone is not very intelligent as a child, he or she cannot be very intelligent as an adult, even if he or she tries to.

For each of these 4 statements, student participants were asked to state their level of agreement using only the following responses: Strongly Agree, Agree, Neutral, Disagree, or Strongly Disagree. Item 2 was reverse coded compared to the other items from the ITQ (see Table 26).

Table 26

*Intelligence Domain Items of the Implicit Theories Questionnaire (ITQ) for the Student Survey*

| Item | Scoring |
|---|---|
| 1. How intelligent you are is not at all changeable by yourself. | Strongly Agree = 1; Agree = 2; Neutral = 3; Disagree = 4; Strongly Disagree = 5 |
| 2. How intelligent you are depends mainly on your own effort. | Strongly Agree = 5; Agree = 4; Neutral = 3; Disagree = 2; Strongly Disagree = 1 |
| 3. You cannot influence how intelligent you are. | Strongly Agree = 1; Agree = 2; Neutral = 3; Disagree = 4; Strongly Disagree = 5 |
| 4. If someone is not very intelligent as a child, he or she cannot be very intelligent as an adult even if he or she tries to. | Strongly Agree = 1; Agree = 2; Neutral = 3; Disagree = 4; Strongly Disagree = 5 |

When looking at the descriptive statistics for the Intelligence Domain, the means for Item 1 and 2 (Item 1=3.35 and Item 2=3.50) differs slightly from the mean of Item 3 and 4 (Item 3=4.00 and Item 4=4.12). The lowest median was 3.5 from Item 1 whereas Items 2 through 4 had a median of 4.0. The mode of each of the items was 4 except for Item 2 which had a mode of 2. The item with the least amount of deviation was Item 3 (SD=.59) when compared with Items 1 (SD=1.20), 2 (SD=1.24), and 4 (SD=1.06; see Table 27).

Table 27

*Central Tendency of Intelligence Design items from the Implicit Theories Questionnaire of the Student Survey*

| | *Item 1* | *Item 2* | *Item 3* | *Item 4* |
|---|---|---|---|---|
| Mean | 3.35 | 3.50 | 4.00 | 4.12 |
| Median | 3.50 | 4.00 | 4.00 | 4.00 |
| Mode | 4 | 2 | 4 | 4 |
| Std. Deviation | 1.20 | 1.24 | 1.06 | .59 |
| Range | 5 | 4 | 5 | 3 |

*Note.* Student participants (*N* = 26)

*Item 1: "How intelligent you are is hardly or not changeable by yourself."* In response to this statement, nearly half of the students responded with either *disagree* (30.8%) or *strongly disagree* (19.2%). These answers are reflective of a growth mindset. The second largest response, however, was *agree* (26.9%), typical of a fixed mindset (Table 28).

Table 28

*Item #1: How Intelligent You are is Hardly or not at all Changeable by Yourself*

| | Frequency | Percent |
|---|---|---|
| Strongly Agree | 1 | 3.8 |
| Agree | 7 | 26.9 |
| Neutral | 5 | 19.2 |
| Disagree | 8 | 30.8 |
| Strongly Disagree | 5 | 19.2 |
| Total | 26 | 100.0 |

*Note*. Student participants (*N* = 26)

*Item 2: "How intelligent you are depends mainly on your own effort."* Similar to the above item, the majority of students responded that they *agree* (30.8%) or *disagree* (26.9%) with this statement indicating a growth mindset (see Table 20). There were still many who responded *disagree* (34.6%; see Table 29).

Table 29

*Item #2: How Intelligent You are Depends Mainly on your Own Effort*

| | Frequency | Percent |
|---|---|---|
| Strongly Disagree | 0 | 0 |
| Disagree | 9 | 34.6 |
| Neutral | 2 | 7.7 |
| Agree | 8 | 30.8 |
| Strongly Agree | 7 | 26.9 |
| Total | 95 | 100.0 |

*Note.* Student participants ($N = 26$)

Table 30

*Item #3: You Cannot Influence how Intelligent You Are*

| | Frequency | Percent |
|---|---|---|
| Strongly Agree | 1 | 3.8 |
| Agree | 2 | 7.7 |
| Neutral | 2 | 7.7 |
| Disagree | 12 | 46.2 |
| Strongly Disagree | 9 | 34.6 |
| Total | 26 | 100.0 |

*Note*. Student participants ($N = 26$)

*Item 3: "You cannot influence how intelligent you are."* The vast majority of students disagreed with this statement indicating, once again, a growth mindset for the majority of student participants. Most student participants responded that they *disagree* (46.2%) or *strongly disagree* (34.6%). In fact, only 11.5% of student participants responded that they *agree* or *strongly disagree* (see Table 30).

*Item 4: If someone is not very intelligent as a child, he or she cannot be very intelligent as an adult, even if he or she tries to.* More so than the other items, students almost unanimously responded *disagree* (65.4%) or *strongly disagree* (23.1%) with this statement, once again reflecting a growth mindset. None of the students agreed or strongly agreed with this statement and only 11.5% responded *neutral* (see Table 31).

Table 31

*Item #4: If Someone is Not Very Intelligent as a Child, He or She Cannot be Very Intelligent as an Adult, Even if He or She Tries To*

| | Frequency | Percent |
|---|---|---|
| Strongly Agree | 0 | 0 |
| Agree | 0 | 0 |
| Neutral | 3 | 11.5 |
| Disagree | 17 | 65.4 |
| Strongly Disagree | 6 | 23.1 |
| Total | 26 | 100.0 |

*Note*. Student participants ($N = 26$)

Table 32

*STICSA Items, Scoring, and Type of Anxiety Measured*

| Item | Scoring | Type of Anxiety |
|---|---|---|
| 1. My heart beats fast | 1-4 | Somatic |
| 2. My muscles are tense | 1-4 | Somatic |
| 3. I feel agonized over my problems | 1-4 | Cognitive |
| 4. I think that others won't approve of me | 1-4 | Cognitive |
| 5. I feel like I'm missing out on things because I can't make up my mind soon enough | 1-4 | Cognitive |

(continued)

| Item | Scoring | Type of Anxiety |
|---|---|---|
| 6. I feel dizzy | 1-4 | Cognitive |
| 7. My muscles feel weak | 1-4 | Somatic |
| 8. I feel trembly and shaky | 1-4 | Cognitive |
| 9. I picture some future misfortune | 1-4 | Cognitive |
| 10. I can't get some thought out of my mind | 1-4 | Cognitive |
| 11. I have trouble remembering things | 1-4 | Cognitive |
| 12. My face feels hot | 1-4 | Somatic |
| 13. I think that the worst will happen | 1-4 | Cognitive |
| 14. My arms and legs feel stiff | 1-4 | Somatic |
| 15. My throat feels dry | 1-4 | Somatic |
| 16. I keep busy to avoid uncomfortable thoughts | 1-4 | Cognitive |
| 17. I cannot concentrate without irrelevant thoughts Cognitive intruding | 1-4 | Cognitive |
| 18. My breathing is fast and shallow | 1-4 | Somatic |
| 19. I worry that I cannot control my thoughts as well as I would like to | 1-4 | Cognitive |
| 20. I have butterflies in the stomach | 1-4 | Cognitive |
| 21. My palms feel clammy | 1-4 | Somatic |

*Note:* This table includes the 21 items from STICSA, all of which were asked twice on the survey, once to score for trait anxiety and once for state anxiety. The scoring for each item is as follows: *not at all* = 1; *a little* = 2; *moderately* = 3; *very much so* = 4.

***Student Anxiety (STICSA).*** The State–Trait Inventory for Cognitive and Somatic Anxiety (STICSA; Grös et al., 2007) was designed to assess symptoms of anxiety as they relate to both the current state of an individual as well as the general trait of an individual. There are two parts to this inventory. The first part is entitled "Your Mood at This Moment" and seeks to measure levels of acute anxiety. The second part is "Your General Mood State" which seeks to measure levels of chronic anxiety. Both parts consist of 21 questions each totaling 42 questions

for the entire inventory. Respondents answer each question using a scale that includes the following responses: *not at all*, *a little*, *moderately*, and *very much so*.

The STICSA also distinguishes between somatic anxiety (i.e. hyperventilation, palpitations, muscle tension) and cognitive anxiety (i.e. worry, intrusive thoughts, inability to concentrate; Ree et al., 2008). Research suggests somatic anxiety and cognitive anxiety are distinguishable for both acute anxiety and chronic anxiety (Ree et al., 2008).

For the item analysis of the STICSA, the survey items will be analyzed in four groupings: Trait-Somatic, Trait-Cognitive, State-Somatic, and Trait-Cognitive. For each of these groupings, the means and the standard deviation of each item will be presented in order from highest to lowest. Following the presentation of the means and the standard deviations for each item, the frequency distribution will be presented for each item within each of the groupings. Lastly, the data of all Total Scores will be analyzed.

Table 33

*Descriptive Statistics for the Trait-Somatic Items on the Student Survey*

| | My heart beats fast | My muscles are tense | My muscles feel weak | My face feels hot | My arms and legs feel stiff | My throat feels dry | My breathing is fast and shallow | My palms feel clammy |
|---|---|---|---|---|---|---|---|---|
| Mean | 2.35 | 2.54 | 1.77 | 1.85 | 1.81 | 1.62 | 1.42 | 1.50 |
| Median | 2.50 | 3.00 | 2.00 | 1.50 | 2.00 | 1.50 | 1.00 | 1.00 |
| Mode | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| SD | .84 | 1.03 | .91 | 1.01 | .90 | .70 | .64 | .81 |
| Range | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |

*Note*. Student participants ($N = 26$)

***Trait-Somatic Item Analysis***. For the 8 items in the Trait-Somatic grouping, the item means ranged from 1.42 to 2.54. The higher the score, the more students admitted to having experienced that particular phenomenon. For these participants, the most experienced phenomenon was having tenses muscles (M=2.54) followed by a fast beating heart (M=2.35).

These two particular items also had modes of 3 whereas the rest of the items in this set had modes of only 1. *My muscles are tense* also had the largest standard deviation of all 8 items (SD=1.03). In contrast, the two least experienced phenomenon was breathing that is *fast and shallow* (M=1.42) and clammy palms (M=1.50; see Table 33).

*Trait-Somatic Frequency Statistics*. Students were asked to select the descriptor *(not at all, a little, moderately, or very much so*) that best indicated how often, in general, the statements were true for them. Of the 8 Trait-Somatic items (see Table 34 and 35), only 1 item, *my muscles are tense*, received more responses of *moderately* or *very much so* as opposed to *not at all* or *a little* (53.8%) than any of the other items (see Table 34 and 35). *My heart beats fast* also had quite a few *moderately* or *very much so* responses (50%). None of the other 6 Trait-Somatic items had more than 26.9% answering with one of these two responses.

Table 34

*Frequency Distribution of the First Four Trait-Somatic Items from the Student Survey*

| | My heart beats fast | | My muscles are tense" | | "my face feels hot" | | "my arms and legs feel stiff" | |
|---|---|---|---|---|---|---|---|---|
| | Freq. | Percent | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| *Not at all* | 5 | 19.2 | 5 | 19.2 | 13 | 50.0 | 12 | 46.2 |
| *A little* | 8 | 30.8 | 7 | 26.9 | 6 | 23.1 | 8 | 30.8 |
| *Moderately* | 12 | 46.2 | 9 | 34.6 | 5 | 19.2 | 5 | 19.2 |
| *Very much so* | 1 | 3.8 | 5 | 19.2 | 2 | 7.7 | 1 | 3.8 |
| Total | 26 | 100.0 | 26 | 100.0 | 26 | 100.0 | 26 | 100.0 |

*Note*. Student participants (*N* = 26)

Table 35

*Frequency distribution of the second four Trait-Somatic items from the Student Survey*

| | My muscles feel weak | | My throat feels dry | | My breathing is fast and shallow | | My palms feel clammy | |
|---|---|---|---|---|---|---|---|---|
| | Freq. | Percent | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| *Not at all* | 12 | 46.2 | 13 | 50.0 | 17 | 65.4 | 17 | 65.4 |
| *A little* | 10 | 38.5 | 10 | 38.5 | 7 | 26.9 | 6 | 23.1 |
| *Moderately* | 2 | 7.7 | 3 | 11.5 | 2 | 7.7 | 2 | 7.7 |
| *Very much so* | 2 | 7.7 | 0 | 0 | 0 | 0 | 1 | 3.8 |
| Total | 26 | 100.0 | 26 | 100.0 | 26 | 100.0 | 26 | 100.0 |

*Note*. Student participants ($N = 26$)

More students responded *very much so* when prompted with *my muscles are tense* than any of the other items (19.2%). In addition, another 34.6% responded that they *moderately* experienced this phenomenon. More students responded with *moderately* to the statement, *my heart beats fast*, than any of the other items (46.2%). The item with the second most responses of *moderately* was to the prompt, *my muscles are tense* (see Tables 34 and 35).

***Trait-Cognitive Item Analysis.*** For the 13 items in the Trait-Cognitive grouping, the item means ranged from 1.50 to 2.81. The higher the score, the more students admitted to frequently experiencing the phenomenon contained within that statement. From this group of student participants, students most regularly experienced *agony over problems* (2.81), the *inability to stop thinking about specific things* (2.73), and the *need for approval from others* (2.58; see Table 36). The *inability to stop thinking about specific things* also had the highest mode of 4. The other two items with the highest means also had the next highest mode of 3. No other item had a mode higher than 2.

Table 36

*Descriptive Statistics of the Trait-Cognitive Items from the Student Survey*

| | Agonized over problems | Approval from others | Missing out on things | Dizzy | Trembly and shaky | Picture future misfortune | Thoughts stuck in mind |
|---|---|---|---|---|---|---|---|
| Mean | 2.81 | 2.58 | 2.27 | 1.69 | 1.50 | 2.31 | 2.73 |
| Median | 3.00 | 3.00 | 2.00 | 1.00 | 1.00 | 2.00 | 3.00 |
| Mode | 3 | 3 | 2 | 1 | 1 | 2 | 4 |
| SD | .94 | .90 | 1.08 | .93 | .71 | 1.01 | 1.22 |
| Range | 3 | 3 | 3 | 3 | 2 | 3 | 3 |

| | Trouble remembering things | Worst will happen | Busy to avoid uncomfortable thoughts | Cannot concentrate | Worry about uncontrollable thoughts | Butterflies in stomach |
|---|---|---|---|---|---|---|
| Mean | 1.92 | 2.46 | 2.31 | 2.35 | 2.00 | 1.88 |
| Median | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 |
| Mode | 1 | 2 | 2 | 1 | 1[a] | 1 |
| SD | 1.06 | 1.10 | 1.09 | 1.26 | 1.06 | 1.07 |
| Range | 3 | 3 | 3 | 3 | 3 | 3 |

*Note*. Student participants ($N = 26$); a. Multiple modes exist; The smallest value is shown

*Trait-Cognitive Frequency Statistics***.** Of the 13 Trait-Cognitive items (see Tables 37, 38, 39, and 40), only three had more responses of *moderately* or *very much so* as opposed to *not at all* or *a little*: *I feel agonized over my problems* (69.3%; see Table 37), *I think that others won't approve of me* (61.5%; see Table 37), and *I can't get some thought out of my mind* (57.7%; see Table 38). More participants replied that they *very much so* cannot *get some thought out of my mind* than any of the other Trait-Cognitive items (38.5%; see Table 40).

There were three bimodal distributions among the Trait-Cognitive items. The first, *I can't get some thought out of my mind*, had 23.1% of the responses as *not at all*, 19.2% as *a little* or *moderately*, and 38.5% as *very much so* (see Table 38). The second, and perhaps most drastically, *I cannot concentrate without irrelevant thoughts intruding* had 34.6% of the responses as *not at all*, 26.9% as *a little*, 7.7% as *moderately*, and 30.8% as *very much so* (see Table 39). Lastly, *I worry that I cannot control my thoughts as well as I would like to* had 38.5% of the responses of *not at all*, 38.5% as *a little*, 7.7% as *moderately*, and 15.4% as *very much so* (see Table 39).

Table 37

*Frequency Distribution of the Trait-Cognitive Items (1-4) from the Student Survey*

| | I feel agonized over my problems | | I think that others won't approve of me | | I feel I'm missing out on things; I can't make up my mind | | I feel dizzy | |
|---|---|---|---|---|---|---|---|---|
| | Freq. | Percent | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| *Not at all* | 3 | 11.5 | 4 | 15.4 | 7 | 26.9 | 15 | 57.7 |
| *A little* | 5 | 19.2 | 6 | 23.1 | 10 | 38.5 | 5 | 19.2 |
| *Moderately* | 12 | 46.2 | 13 | 50.0 | 4 | 15.4 | 5 | 19.2 |
| *Very much so* | 6 | 23.1 | 3 | 11.5 | 5 | 19.2 | 1 | 3.8 |
| Total | 26 | 100.0 | 26 | 100.0 | 26 | 100.0 | 26 | 100.0 |

*Note*. Student participants ($N = 26$)

Table 38

*Frequency Distribution of the Trait-Cognitive Items (5-7) from the Student Survey*

| | I feel trembly and shaky | | I picture some future misfortune | | I can't get some thought out of my mind | |
|---|---|---|---|---|---|---|
| | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| *Not at all* | 16 | 61.5 | 6 | 23.1 | 6 | 23.1 |
| *A little* | 7 | 26.9 | 10 | 38.5 | 5 | 19.2 |
| *Moderately* | 3 | 11.5 | 6 | 23.1 | 5 | 19.2 |
| *Very much so* | 0 | 0 | 4 | 15.4 | 10 | 38.5 |
| Total | 26 | 100.0 | 26 | 100.0 | 26 | 100.0 |

*Note*. Student participants ($N = 26$)

Table 39

*Frequency Distribution of the Trait-Cognitive Items (8-10) from the Student Survey*

| | I have trouble remembering things | | I think that the worst will happen | | I keep busy to avoid uncomfortable thoughts | |
|---|---|---|---|---|---|---|
| | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| *Not at all* | 12 | 46.2 | 6 | 23.1 | 7 | 26.9 |
| *A little* | 7 | 26.9 | 8 | 30.8 | 9 | 34.6 |
| *Moderately* | 4 | 15.4 | 6 | 23.1 | 5 | 19.2 |
| *Very much so* | 3 | 11.5 | 6 | 23.1 | 5 | 19.2 |
| Total | 26 | 100.0 | 26 | 100.0 | 26 | 100.0 |

*Note*. Student participants ($N = 26$)

Table 40

*Frequency Distribution of the Trait-Cognitive Items (11-13) from the Student Survey*

| | I cannot concentrate without irrelevant thoughts intruding | | I worry that I cannot control my thoughts as well as I would like to | | I have butterflies in the stomach | |
|---|---|---|---|---|---|---|
| | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| *Not at all* | 9 | 34.6 | 10 | 38.5 | 14 | 53.8 |
| *A little* | 7 | 26.9 | 10 | 38.5 | 3 | 11.5 |
| *Moderately* | 2 | 7.7 | 2 | 7.7 | 7 | 26.9 |
| *Very much so* | 8 | 30.8 | 4 | 15.4 | 2 | 7.7 |
| Total | 26 | 100.0 | 10 | 38.5 | 26 | 100.0 |

*Note*. Student participants ($N = 26$)

***State-Somatic Item Analysis.*** For the 8 State-Somatic items the means ranged from 2.42 to 1.42. The two items with the highest mean was *my muscles are tense* (M=2.42) and *my heart beats fast* (M=2.31). *My heart beats fast* was also the only item with a mode of 2 versus each of the others with a mode of only 1. The standard deviation was also the highest for the 2 items with the highest means: *my muscles are tense* (SD=1.27) and *my heart beats fast* (SD=1.12; see Table 41).

Table 41

*Descriptive Statistics for the State-Somatic Items on the Student Survey*

| | My heart beats fast | My muscles are tense | My muscles feel weak | My face feels hot | My arms and legs feel stiff | My throat feels dry | My breathing is fast and shallow | My palms feel clammy |
|---|---|---|---|---|---|---|---|---|
| Mean | 2.31 | 2.42 | 1.85 | 1.65 | 1.65 | 1.46 | 1.46 | 1.42 |
| Median | 2.00 | 2.00 | 1.50 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Mode | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| SD | 1.12 | 1.27 | 1.05 | .85 | .98 | .58 | .71 | .70 |
| Range | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 |

*Note*. Student participants ($N = 26$)

**Frequency Distribution (State-Somatic).** Review of the State-Somatic frequency distribution reveals two items with bimodal distributions. The first, *my heart beats fast*, had 26.9% respond *not at all*, 38.5% *a little*, 11.5% *moderately*, and 23.1% *very much so*. The second, "*my muscles are tense*", had 34.6% respond "*not at all*", 19.2% *a little*, 15.4% *moderately*, and 30.8% *very much so* (see Table 42). These two same items were also the only items which did not have at least 75% of the responses as either *not at all* or *a little* (see Tables 40 and 41). Each of the other 6 items had a fairly similar frequency distribution with responses of *not at all* or *a little* ranging from 76.9% to 88.5% (see Tables 42 and 43) indicating students did not experience this phenomenon with great regularity, if at all.

Table 42

*Frequency Distribution of the State-Somatic Items (1-4) from the Student Survey*

| | My heart beats fast | | My muscles are tense | | My face feels hot | | My arms and legs feel stiff | |
|---|---|---|---|---|---|---|---|---|
| | Freq. | Percent | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| *Not at all* | 7 | 26.9 | 9 | 34.6 | 14 | 53.8 | 15 | 57.7 |
| *A little* | 10 | 38.5 | 5 | 19.2 | 8 | 30.8 | 8 | 30.8 |
| *Moderately* | 3 | 11.5 | 4 | 15.4 | 3 | 11.5 | 3 | 11.5 |
| *Very much so* | 6 | 23.1 | 8 | 30.8 | 1 | 3.8 | 0 | 0 |

*Note*. Student participants ($N = 26$)

Table 43

*Frequency Distribution of the State-Somatic Items (5-8) from the Student Survey*

| | My muscles feel weak | | My throat feels dry | | My breathing is fast and shallow | | My palms feel clammy | |
|---|---|---|---|---|---|---|---|---|
| | Freq. | Percent | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| *Not at all* | 13 | 50.0 | 15 | 57.7 | 17 | 65.4 | 18 | 69.2 |
| *A little* | 7 | 26.9 | 10 | 38.5 | 6 | 23.1 | 5 | 19.2 |
| *Moderately* | 3 | 11.5 | 1 | 3.8 | 3 | 11.5 | 3 | 11.5 |
| *Very much so* | 3 | 11.5 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note*. Student participants ($N = 26$)

***State-Cognitive Item Analysis.*** The descriptive statistics for State-Cognitive anxiety as experienced by the participants indicates means ranging from 2.88 to 1.42 (see Table 44). The highest mean reveals participants *agonized over problems* (M=2.88) more often than each of the other phenomenon. The second highest mean was for the seeking approval from others (M=2.77). Two other items had a mean of 2.50 (*Picture future misfortune* and *thoughts stuck in mind*; see Table 44).

The medians ranged from 3.0 to 1.0. The same two with the highest means also had the highest medians of 3.0. The third and fourth highest means also had the next two highest medians of 2.5.

Review of the modes reveals that these two items with the highest means and medians also had the highest modes. More participants chose *moderately* or *very much so* when asked if they had experienced agony over problems or if they seek approval from others (see Table 44).

Table 44

*Descriptive Statistics of the State-Cognitive items from the Student Survey*

| | Agonized over problems | Approval from others | Missing out on things. | Dizzy | Trembly and shaky | Picture future misfortune. | Thoughts stuck in mind |
|---|---|---|---|---|---|---|---|
| Mean | 2.88 | 2.77 | 2.12 | 1.42 | 1.50 | 2.50 | 2.50 |
| Median | 3.00 | 3.00 | 2.00 | 1.00 | 1.00 | 2.50 | 2.50 |
| Mode | 4 | 4 | 1 | 1 | 1 | 2[a] | 1[a] |
| SD | 1.03 | 1.11 | 1.11 | .81 | .81 | 1.11 | 1.18 |
| Range | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| | Trouble remembering things | Worst will happen | Busy to avoid uncomfortable thoughts | Cannot concentrate | Worry about uncontrollable throughts | Butterflies in stomach |
|---|---|---|---|---|---|---|
| Mean | 1.73 | 2.50 | 2.15 | 2.08 | 2.08 | 2.12 |
| Median | 1.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Mode | 1 | 2 | 2 | 2 | 1 | 1 |
| SD | 1.00 | 1.11 | 1.08 | 1.02 | 1.09 | 1.20 |
| Range | 3 | 3 | 3 | 3 | 3 | 3 |

*Note*. Student participants ($N$ = 26); a. multiple modes exist; the smallest value is shown

***State-Cognitive Frequency Distribution***. Of the 13 State-Cognitive items (see Tables 45, 46, 47, and 48), the item most experienced by participants was the feeling of being *agonized over my problems*. For this item, 30.8% of participants responded as to *moderately* experiencing this agony, with another 34.6% *very much so* experiencing this agony (see Table 45). The item experienced second most often by participants was the thought that *others won't approve of me*. For this item, 23.1% of the participants responded as to *moderately* experiencing this thought, while another 34.6% experienced this *very much so* (see Table 45).

The items experienced least by participants was feeling *trembly and shaky* or *dizzy*, with only 10.5% of students responding as to feeling these phenomena *moderately* or *very much so* (see Tables 45 and 46).

Within these 13 State-Cognitive items, two had a fairly equal distribution across all 4 possible responses. *I picture some misfortune* and *I can't get some thought out of my mind* had anywhere between 23.1% and 26.9% respond to each of the possibilities (see Table 46).

Lastly, of these items, there were three significant bimodal distributions. First, the majority of the students responded that they thought *the worst will happen a little* (38.5%), with the second most listed response as *very much so* (26.9%; see Table 47). Between these 2 responses was *moderately* with 15.4% of the responses. Second, there was also a bimodal distribution for the item, *I keep busy to avoid uncomfortable thoughts*. Once again, the majority of students responded that they kept busy to *avoid uncomfortable thoughts a little* (42.3%), but 19.2% responded that they *very much so* experience this phenomenon. Between these 2 responses, only 7.7% responded that they *moderately* stay busy for this reason (see Table 47). Third, for the item *I cannot concentrate without irrelevant thoughts intruding*, 46.2% responded

that they experience this *a little*. However, 15.4 % responded that they *very much so* experience this difficulty in concentration (see Table 48).

Table 45

*Frequency Distribution of the State-Cognitive Items (1-4) from the Student Survey*

| | I feel agonized over my problems | | I think that others won't approve of me | | I feel I'm missing out; I can't make up my mind | | I feel dizzy | |
|---|---|---|---|---|---|---|---|---|
| | Freq. | Percent | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| Not at all | 3 | 11.5 | 4 | 15.4 | 10 | 38.5 | 19 | 73.1 |
| A little | 6 | 23.1 | 7 | 26.9 | 7 | 26.9 | 4 | 15.4 |
| Moderately | 8 | 30.8 | 6 | 23.1 | 5 | 19.2 | 2 | 7.7 |
| Very much so | 9 | 34.6 | 9 | 34.6 | 4 | 15.4 | 1 | 3.8 |

*Note*. Student participants ($N = 26$)

Table 46

*Frequency Distribution of the State-Cognitive Items (5-8) from the Student Survey*

| | I feel trembly and shaky | | I picture some future misfortune | | I can't get some thought out of my mind | |
|---|---|---|---|---|---|---|
| | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| *Not at all* | 17 | 65.4 | 6 | 23.1 | 7 | 26.9 |
| *A little* | 6 | 23.1 | 7 | 26.9 | 6 | 23.1 |
| *Moderately* | 2 | 7.7 | 7 | 26.9 | 6 | 23.1 |
| *Very much so* | 1 | 3.8 | 6 | 23.1 | 7 | 26.9 |

*Note*. Student participants ($N = 26$)

Table 47

*Frequency Distribution of the State-Cognitive Items (8-10) from the Student Survey (N = 26)*

| | I have trouble remembering things | | I think that the worst will happen | | I keep busy to avoid uncomfortable thoughts | |
|---|---|---|---|---|---|---|
| | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| *Not at all* | 15 | 57.7 | 5 | 19.2 | 8 | 30.8 |
| *A little* | 5 | 19.2 | 10 | 38.5 | 11 | 42.3 |
| *Moderately* | 4 | 15.4 | 4 | 15.4 | 2 | 7.7 |
| *Very much so* | 2 | 7.7 | 7 | 26.9 | 5 | 19.2 |

*Note*. Student participants ($N = 26$)

Table 48

*Frequency Distribution of the State-Cognitive Items (11-13) from the Student Survey*

| | I cannot concentrate without irrelevant thoughts intruding | | I worry that I cannot control my thoughts as well as I would like to | | I have butterflies in the stomach | |
|---|---|---|---|---|---|---|
| | Freq. | Percent | Freq. | Percent | Freq. | Percent |
| Not at all | 8 | 30.8 | 10 | 38.5 | 11 | 42.3 |
| A little | 12 | 46.2 | 8 | 30.8 | 5 | 19.2 |
| Moderately | 2 | 7.7 | 4 | 15.4 | 4 | 15.4 |
| Very much so | 4 | 15.4 | 4 | 15.4 | 5 | 19.2 |

*Note*. Student participants ($N = 26$)

**Score Analysis of the Student Survey**

**STICSA Anxiety: Total Score Item Analysis.** Due to the amount of questions and the resulting wide range of possible total scores (42-168), there was a large range of scores for the participating students (range = 121). A higher score reveals a greater degree of experienced anxiety. The mean average was 129.85 and a median of 134.50. The standard deviation was also large at 35.61 (see Table 49).

Table 49

*Central Tendency of STICSA Scores*

| | STICSA |
|---|---|
| Mean | 129.85 |
| Median | 134.50 |
| Mode | 96[a] |
| Standard Deviation | 35.61 |
| Range | 121 |

*Note*. Student participants ($N = 26$); a. multiple modes exist; the smallest value is shown

***STICSA anxiety: Total score frequency distribution.*** Review of the frequency distribution for the Total Student Scores from the STICSA reveals a wide range of scores from 68 to 189. Only four scores were shared between two participants each (96, 102, 145, and 155;

see Table 50).

Table 50

*Frequency Distribution of the STICSA Anxiety Total Score from Each of the Student Participants*

| | Frequency | Percent |
|---|---|---|
| 68 | 1 | 3.8 |
| 78 | 1 | 3.8 |
| 82 | 1 | 3.8 |
| 93 | 1 | 3.8 |
| 96 | 2 | 7.7 |
| 97 | 1 | 3.8 |
| 102 | 2 | 7.7 |
| 104 | 1 | 3.8 |
| 125 | 1 | 3.8 |
| 128 | 1 | 3.8 |
| 134 | 1 | 3.8 |
| 135 | 1 | 3.8 |
| 138 | 1 | 3.8 |
| 139 | 1 | 3.8 |
| 145 | 1 | 3.8 |
| 149 | 2 | 7.7 |
| 155 | 2 | 7.7 |
| 167 | 1 | 3.8 |
| 179 | 1 | 3.8 |
| 183 | 1 | 3.8 |
| 188 | 1 | 3.8 |
| 189 | 1 | 3.8 |

*Note*. Student participants ($N = 26$)

***Student mindset score: Item analysis***. The Student Mindset Score suggests a stronger growth mindset with a high score and a fixed mindset with a lower score. The range for possible scores is from 4-20 with a mean score of 12. The data from the student survey reveals a higher mean of 14.96, a median of 15, and a mode of 14 (see Table 51).

Table 51

*Central Tendency: STICSA Anxiety Total for Student Participants*

| | Student Mindset Total |
|---|---|
| Mean | 14.96 |
| Median | 15.00 |
| Mode | 14[a] |
| Std. Deviation | 3.10 |
| Range | 11 |

*Note*. Student participants (*N* = 26); multiple modes exist, the smallest value is shown

***Student mindset score: Frequency distribution***. Keeping in mind the possible scores for the test range from 4-20, the frequency distribution for these student participants was 9 to 20. There were 2 modes for this particular distribution, 14 and 15, both of which had a frequency of 5 (see Table 52).

Table 52

*Frequency Distribution for the Student Mindset Total Scores*

| | Frequency | Percent |
|---|---|---|
| 9 | 2 | 7.7 |
| 11 | 2 | 7.7 |
| 12 | 2 | 7.7 |
| 13 | 1 | 3.8 |
| 14 | 4 | 15.4 |
| 15 | 4 | 15.4 |
| 16 | 3 | 11.5 |
| 17 | 2 | 7.7 |
| 18 | 2 | 7.7 |
| 19 | 2 | 7.7 |
| 20 | 2 | 7.7 |
| Total | 26 | 100.0 |

*Note*. Student participants (*N* = 26)

**Academic Demographics of Participating Students**

The last portion of the Student Survey included the academic demographics of the students themselves. The demographics portion of the survey included items related to the following: gender, origin, race (see Table 10), highest ACT score, highest SAT score, current GPA, the number of colleges to which the student applied, the names of the most highly selective colleges to which the student applied, and, if known, the student's anticipated major.

**Student Current Grade Point Average (GPA)**. The mean score for GPA among study participants was a 3.68. The median was slightly above at a 3.70 while the mode was slightly lower at 3.50. The standard deviation was 0.33. The range of GPA was 1.62 with the lowest GPA being 3.10 and the highest GPA being 4.72 (see Table 53).

Table 53

*Frequency Distribution of Student GPA's*

| | Frequency | Percent |
|---|---|---|
| 3.10-3.50 | 9 | 34.6 |
| 3.54-3.75 | 8 | 30.8 |
| 3.80-4.00 | 8 | 30.8 |
| Missing | 1 | 3.8 |

*Note.* Student participants ($N = 26$)

Table 54

*Central Tendency: Demographics of Student Participants*

| | Current GPA |
|---|---|
| Valid | 25 |
| Mean | 3.68 |
| Median | 3.70 |
| Mode | 3.50 |
| Standard Deviation | .32 |
| Range | 1.62 |

*Note.* Student participants (N = 26)

**Highest SAT Scores.** The range of SAT scores from the study's participants was from a low score of 1600 to a high score of 2320. To put these scores in perspective, according to data provided by the College Board, the lowest score of these student participants was still in the 60th percentile when compared with all students across the nation (College Board, 2014). Three participants either did not take the SAT or chose not to answer this particular question (see Table 55).

Table 55

*Frequency Distribution of Student SAT scores*

| | Frequency | Percent |
|---|---|---|
| 2000-2320 | 5 | 19.2 |
| 1890-1950 | 6 | 23.0 |
| 1780-1880 | 4 | 15.3 |
| 1600-1700 | 4 | 15.3 |
| Missing | 7 | 26.9 |

*Note*. Student participants ($N = 26$)

**Central Tendency of Student SAT Scores.** Of the 26 student participants, 19 included their highest SAT scores as they journey through the college application process. The mean, median, and mode were all fairly consistent. The mean average was 1899, the median 1890 and the mode was also 1890 (see Table 56). Compared nationwide, the median of 1890 for this study's participants would place in the 85th percentile according to the national data from College Board (College Board, 2014). The range of scores for student participants was 720 out of a possible 2400 points (see Table 56).

Table 56

*Central Tendency: Demographics of Student Participants*

| | SAT score |
|---|---|
| Valid | 19 |
| Missing | 7 |
| Mean | 1899 |
| Median | 1890 |
| Mode | 1890 |
| Standard Deviation | 192 |
| Range | 720 |

*Note*. Student participants ($N = 26$)

**Highest ACT Score.** Of the student participants, 19 of the 26 students reported their ACT scores. Some independent schools allow and even encourage students to either take the ACT or the SAT test for admittance into college. The mean score was a 28 and the mode and median was 27. According to the National Distributions of Cumulative Percents for ACT Test Scores (ACT, 2014), the national mean was a 21. According to this same report, the mean score of 28 from this study is the 90th percentile when compared to the rest of ACT test takers. The range of 10 from 22 to 32 was equivalent to the 68th percentile to the 98th percentile, once again according to the National Distributions of Cumulative Percents for ACT Test Scores (see Tables 57 and 58).

Table 57

*Frequency Distribution of highest ACT score*

| | Frequency | Percent |
|---|---|---|
| 22 - 25 | 3 | 11.5 |
| 26 | 3 | 11.5 |
| 27 | 4 | 15.4 |
| 29 | 2 | 7.7 |
| 30 | 3 | 11.5 |
| 31 | 1 | 3.8 |
| 32 | 3 | 11.5 |
| Missing | 7 | 26.9 |

*Note*. Student participants ($N = 26$)

Table 58

*Central Tendency of highest ACT scores*

| | |
|---|---|
| Mean | 28.00 |
| Median | 27.00 |
| Std. Deviation | 2.87 |
| Range | 10 |
| Minimum | 22 |
| Maximum | 32 |

*Note*. Student participants ($N = 19$)

**Number of College Applications Per Student.** One of the questions in the demographics portion of the survey asked students to account for the number of colleges to which they applied during the college application process. The statistics of central tendency reveals that the student participants, on average, applied to 10 colleges, universities, or academies. The mode for this data was 13 and the range was 17 (see Table 59).

Table 59

*Central Tendency: Number of College Applications Per Student*

| | Number of College Applications |
|---|---|
| Mean | 10.08 |
| Median | 10.00 |
| Mode | 13 |
| SD | 4.60 |
| Missing | 1 |
| Range | 17 |

*Note*. Student participants ($N = 26$)

As can be seen both through the central tendency statistics as well as the frequency distribution, of the student participants, more students applied to 13 colleges than any other number (Mode = 13). There was also a wide range of 17 due to the fact that one student applied to only one college and another applied to 18 (see Table 60).

Table 60

*Frequency Distribution: Number of College Applications Per Student*

| | Frequency | Percent |
|---|---|---|
| 1 | 1 | 3.8 |
| 4-6 | 6 | 23.0 |
| 7-10 | 6 | 23.0 |
| 11-14 | 8 | 30.1 |
| 15-16 | 2 | 7.7 |
| 18 | 2 | 7.7 |
| Missing | 1 | 3.8 |

*Note*. Student participants ($N = 26$)

**Highly Selective Colleges to which Student Participants Applied.** In reviewing which highly selective institutions were selected by students to which to apply, it can be seen that the most applications from this pool of students were sent to the University of California Berkeley and to the University of Southern California, both of which had 8 applicants ($N = 26$). Of the

student participants, 4 applied to Stanford and 3 applied to a couple Ivy League schools: Brown University and Cornell University (see Table 61).

Of the 26 student participants, 16 (61.5%) applied to at least one *highly selective* college, university, or academy (Taylor, 2013). Of those 16, seven (26.9%) applied to only one highly selective institution. An additional six students applied to between two and five highly selective institutions. There were three students who applied to seven or more highly selective institutions; two applied to seven and one applied to eight (see Table 62).

Table 61

*Frequency Distribution: The Most Highly Selective Colleges to which Participants Applied*

| School | Frequency |
|---|---|
| Barnard College | 1 |
| Brown University | 6 |
| Claremont McKenna College | 6 |
| Columbia University | 8 |
| Cornell University | 2 |
| Duke University | 2 |
| Georgetown University | 1 |
| Georgetown University | 1 |
| Harvard University | 2 |
| Harvey Mudd College | 1 |
| Johns Hopkins University | 2 |
| Northwestern University | 1 |
| Pitzer College | 1 |
| Pomona College | 1 |
| Princeton University | 1 |
| Stanford University | 4 |
| Tulane University | 1 |
| University of California-Berkeley | 8 |
| University of Notre Dame | 2 |
| University of Pennsylvania | 1 |
| University of Southern California | 8 |
| Vanderbilt University | 2 |
| Washington University of St. Louis | 1 |

*Note*. See Appendix E for a full list of highly selective colleges; Student participants (N = 26)

Table 62

*Frequency Distribution of Total Sum of Applications to Highly Selective Colleges*

| Sum of Applications | Frequency | Percent |
|---|---|---|
| 0 | 10 | 38.5 |
| 1 | 7 | 26.9 |
| 2-5 | 6 | 23.0 |
| 7-8 | 3 | 11.5 |

*Note*. Student participants (*N* = 26)

When looking at central tendency data for the sum of applications sent to highly selective colleges, universities, and academies, it can be determined that the student participants sent an average of just under 2 applications (M=1.85) to these institutions. Also seen in the central tendency data is that the median was 1 and the mode was 0. With some students not choosing to apply to any highly selective institutions, and 1 students applying to 8, the range for this data was a total of 8 (see Table 63).

Table 63

*Central Tendency: Total Sum of Applications to Highly Selective Colleges*

| | Total Sum of Applications |
|---|---|
| Mean | 1.85 |
| Median | 1.00 |
| Mode | .00 |
| Std. Deviation | 2.43 |
| Range | 8.00 |

*Note*. Student participants (*N* = 26)

**Anticipated Choice of Major.** One of the questions on the survey asked students to anticipate their choice of major. Three of the students answered “unknown”. The largest percentage of students, 23.1%, answered that they were planning to major in Health Professions. Of the participants, students also listed Business, Social Sciences, and Engineering 11.5% of the time. The rest of the anticipated majors received less than 4% (see Table 64).

Table 64

*Frequency Distribution: Anticipated Choice of Majors Among Student Participants*

| | Frequency |
|---|---|
| Business | 3 |
| Social Sciences | 3 |
| Health Professions | 6 |
| Engineering | 3 |
| Other (see below) | 7 |
| No major selected | 3 |

*Note.* One participant selected each of the following possible majors: Applied Mathematics, Child Development, Communications, Film Production, Forensic Science, Game Design, and Theatre Arts.

**Findings for Research Questions**

The analysis of the collected data sought to answer the following research questions guiding the study:

1. To what extent, if at all, is there a relationship between the mindset of a college-preparatory high school senior and the levels of academic anxiety experienced during the college application process?
2. To what extent, if at all, is there a relationship between the mindset of parents and the levels of academic anxiety experienced by their student during the college application process?
3. What relationship exists, if any, between the mindset of a college-preparatory high school senior and their parent's or guardian's mindset?
4. Are there differences in the mindset of high school seniors attending college-preparatory, private, independent schools, the mindset of their parents/guardians, or their levels of anxiety based on selected demographic variables?

**Relationship Between Student Mindset and Student Anxiety.** The first research question guiding the study was to discover to what extent, if at all, there is a relationship between the mindset of a college-preparatory high school senior and levels of academic anxiety that may be experienced during the college application process. A correlational analysis of the student mindset scores and the STICSA scores used to measure anxiety among the student participants. The analysis included the sub scores of the following types of anxiety: Trait-Somatic, Trait-Cognitive, State-Somatic, State Cognitive, Trait, State, and the total STICSA score. The analysis revealed varied results.

With analysis of the total STICSA score, Trait total score, State total score, Trait-Cognitive, and State-Cognitive, no correlation was found with the anxiety experienced by the participating students (see Table 65).

Table 65

*Correlations between Student Mindset and Student Anxiety*

| | Trait-Cognitive Total | Trait-Anxiety Total | State-Anxiety Total | Cognitive Total | Anxiety Total |
|---|---|---|---|---|---|
| Pearson Correlation | .010 | -.089 | -.136 | .046 | -.108 |
| Sig. (2-tailed) | .960 | .665 | .507 | .828 | .600 |

*Note*. Student participants ($N = 26$)

Conversely, when the Student Mindset Score was analyzed for correlation with Trait-Somatic Anxiety, State-Somatic Anxiety, and the Total Somatic Anxiety Score, a very weak correlation was found (see Table 66). According to Dancey and Reidy (2004), a correlation of at least 2.0 constitutes a weak correlation. These relationships constitute as weak correlations. These correlations were found not to be significant at the 0.01 level (2-tailed; see Table 66).

In addition, these weak correlations were found to have a negative relationship. This is due to the fact that there is an inverse relationship as to how these items are coded. For the STICSA, the higher the score, the higher the levels of experienced anxiety, either within the anxiety subcategories or within the total STICSA score. The Intelligence Domain, which reveals one's particular mindset, is scored in such as way that the higher the score, the more growth minded an individual. Therefore, the negative correlation suggests that the more growth minded an individual, the less that person would experience anxiety (see Table 66).

Table 66

*Correlations with Student Mindset and Student Anxiety*

| | | TraitSomatic | StateSomatic | SomaticTOTAL |
|---|---|---|---|---|
| Student Mindset | Pearson Correlation | -.264 | -.293 | -.297 |
| Total | Sig. (2-tailed) | .192 | .146 | .141 |

*Note.* Student participants ($N = 26$)

**Relationship Between Parent Mindset and Student Anxiety.** The second research question guiding this study was to discover to what extent, if at all, a relationship exists between the mindset of parents and the levels of academic anxiety experienced by their student during the college application process. A correlational analysis was conducted to discover the relationship between parent's mindset and the variety of types of anxiety. Review of this analysis shows there is no relationship between a parent's mindset and their student's level of experienced anxiety during the college application process (see Table 67). The Pearson Correlation ranged from -.003 (Trait-Somatic Anxiety) to -.114 (State-Somatic Anxiety; see Table 67).

Table 67

*Correlations Between Parent Mindset and Levels of Student Anxiety*

| | | Parent Mindset Score |
|---|---|---|
| TraitSomatic | Pearson Correlation | -.003 |
| | Sig. (2-tailed) | .989 |
| TraitCognitive | Pearson Correlation | .087 |
| | Sig. (2-tailed) | .673 |
| TraitAnxietyTotal | Pearson Correlation | .060 |
| | Sig. (2-tailed) | .769 |
| StateSomatic | Pearson Correlation | -.114 |
| | Sig. (2-tailed) | .580 |
| StateCognitive | Pearson Correlation | .035 |
| | Sig. (2-tailed) | .866 |
| StateAnxietyTotal | Pearson Correlation | -.025 |
| | Sig. (2-tailed) | .904 |
| AnxietyTotal | Pearson Correlation | .032 |
| | Sig. (2-tailed) | .876 |
| SomaticTOTAL | Pearson Correlation | -.068 |
| | Sig. (2-tailed) | .743 |
| CognitiveTOTAL | Pearson Correlation | .040 |
| | Sig. (2-tailed) | .849 |

*Note.* Student participants ($N = 26$)

**Relationship between Student Mindset and Parent Mindset.** The third research question guiding this study was to discover what relationship, if any, exists between a student's mindset and their parent's mindset. A correlational analysis reveals a mild correlation between student mindset and parent mindset ($r = .50, p < .05$; see Table 61). Therefore, this study suggests that that there is a weak correlation between a parent's mindset and a student's mindset (see Table 68).

Table 68

*Correlations between Parent Mindset Scores and Student Mindset Scores*

| | | Student Mindset Total |
|---|---|---|
| Mindset Score | Pearson Correlation | .50 |
| | Sig. (2-tailed) | .010 |

*Note.* Student participants ($N = 26$)

**Relationship between Demographics and Student Anxiety**. The last research question was to discover if there are differences in the mindset of high school seniors attending college-preparatory, private, independent schools, the mindset of their parents/guardians, or their levels of anxiety based on the demographic variables contained within the study. The demographics portion of the survey included items related to the following: gender, origin, race, highest ACT score, highest SAT score, current GPA, the number of colleges to which the student applied, the names of the most highly selective colleges to which the student applied, and, if known, the student's anticipated major. A correlational analysis was completed to discover if there were any significant correlations. In all, there were three weak or moderate correlations found (see Table 69).

Table 69

*Correlation between a parent's TIPI Score (Emotional Stability) and their Student's Mindset*

| | Student Mindset Total |
|---|---|
| Pearson Correlation | -.406* |
| Sig. (2-tailed) | .040 |

*Note*. Student participants (N = 26); correlations is significant at the .05 level (2-tailed)

Table 70

Correlations between the number of completed applications to colleges, universities, and academies, and the level of anxiety experienced by a student.

| | | Number of applications to colleges |
|---|---|---|
| Total Student Anxiety | Pearson Correlation | .503* |
| | Sig. (2-tailed) | .010 |

*Note.* Student participants (*N* = 26); correlation is significant at the .05 level (2-tailed)

Table 71

*Correlations between student anxiety and their scores on the ACT and SAT tests*

| | | To date, what is your highest ACT score? | To date, what is your highest SAT score? |
|---|---|---|---|
| Total Student Anxiety | Pearson Correlation | .361 | .089 |
| | Sig. (2-tailed) | .129 | .718 |

*Note.* Student participants (*N* = 26); correlation is significant at the .05 level (2-tailed)

There was an inverse, moderate correlation of statistical significance found between the parent's TIPI scores and their student's mindset (*r = -.41; p = .040*). The higher the TIPI score, the more emotionally stable a parent, and the lower the Intelligence Domain score suggests a student has a stronger fixed mindset. Therefore, this data suggests what seems to be an illogical finding (see Table 69).

A moderate correlation was found involving the relationship between anxiety and the number of applications to college (*r = .50; p = .010*), but there was not a significant correlation between anxiety and the number of applications to "highly selective" colleges. (see Table 70).

Lastly, a correlational analysis of the demographics revealed a statistically insignificant and weak correlation between anxiety and the student scores on the ACT test (*r = .36; p = .129*).

In the analysis between anxiety and the SAT test, there was no correlation and no statistical significance (*r = .09; p = .718*; see Table 71).

**Relationship between Demographics and Mindset.** When reviewing whether there is a relationship between student achievement and mindset, a correlational analysis of these variables reveals no significant correlations with any of the academic achievement data included in this study. There were no significant correlations between SAT scores and either the student mindset (*r = .04, p = .831*) or the parent mindset (*r = .05, p = .865*). In addition, there were also not significant correlations between ACT scores and either the student mindset (*r = .28, p = .238*) or the parent mindset (*r = .23, p = .350*). Lastly, there were also no significant correlations found between student GPA and student mindset (*r = .04, p = .861*) or with parent mindset (*r = -.20, p = .337*; see Table 72).

Table 72

*Correlational Analysis Between Mindset (Both Student and Parent) and Levels of Academic Achievement*

| | | To date, what is your highest ACT score? | To date, what is your highest SAT score? | Current, non-weighted, cumulative (9th-12th grade) GPA? |
|---|---|---|---|---|
| Parent Mindset Score | Pearson Correlation | .23 | .05 | -.20 |
| | Sig. (2-tailed) | .350 | .831 | .337 |
| Student Mindset Score | Pearson Correlation | -.28 | -.04 | -.04 |
| | Sig. (2-tailed) | .238 | .865 | .861 |

*Note*. Student participants (*N* = 26); correlation is significant at the .05 level (2-tailed)

**Summary of Key Findings**

1. There were no significant correlations between Student Anxiety and either Parent Mindset or Student Mindset.

2. There was a moderate correlation of statistical significance between student mindset and their parent's mindset ($r = .50, p < .05$).
3. There was a moderate correlation of statistical significance between the number of college applications a student completed and their levels of overall anxiety ($r = .50; p < .05$).
4. There was an inverse, weak correlation of statistical significance found between the parent's TIPI (emotional stability) scores and their student's mindset ($r = -.41; p < .05$).
5. There were no significant correlations between Student Mindset or Parent Mindset and any measure of academic achievement included in this study (GPA, ACT, or SAT).

# Chapter 5: Study Conclusions

## The Issue and Significance

Generally speaking, life in high school can be quite stressful. For many high school seniors, including those attending private, independent, college preparatory schools, it is not unusual to experience a high degree of anxiety related to academics, GPA, athletic and artistic performance, college preparedness, nationally standardized tests such as the SAT or ACT, and the pursuit of college scholarships and grants (Chace, 2013; Daigneault & Wirtz, 2008; Hannon & McNaughton-Cassill, 2011; Pope & Simon, 2005). For some of these students, the pressure to be accepted into a highly selective college, university, or academy may fuel this anxiety. Others feel the pressure from their family to gain acceptance into one specific school, perhaps their alma mater, or perhaps purely because the college is one of the most highly selective colleges in the country. Many fear that they will not be accepted into *the* college of their choice, or perhaps, into the college of their *parent's* choice (Golden, 2009). To make matters more difficult, high school seniors face unprecedented competition to gain acceptance into the institution of their choice (Folkman et al., 1987). According to NACAC (National Association for College Admission Counseling), there are more students applying to colleges than at any other time in our history (Artani, 2006). However, many colleges are not accepting any more students than they have in previous years. This competition has largely led to more stringent standards of college acceptance throughout the country (Bound et al., 2009).The result has been increased competition among graduating high school students to attend the college of their choice.

This anxiety may only be exacerbated by a narrow definition of success all too common throughout the United States. "In the striving classes in America, you are where you go to college… a sense of national and global instability leads to an apocalyptic urgency about making

it. The young people feel that it's now or never. Or maybe it was yesterday and I missed it" (Mogel, 2005, p. 26). This narrow view of success may add a greater sense of urgency for high school students that, in turn, may lead to heightened levels of unhealthy anxiety.

**Conceptual Foundation**

The two distinct variables of the study are anxiety and mindset. Following is the conceptual foundation of the study and a discussion of these two variables.

**Anxiety**. With increased competitiveness among high school student who are hoping to attend one of America's most highly selective colleges or universities, it is no wonder high levels of anxiety are experienced (Conner et al., 2009; Galloway et al., 2009; Pope & Simon, 2005). However, it is important to first understand the definition of anxiety as well as the various types of anxiety.

Researchers in the field of anxiety explain that there are three components of anxiety. First, the body experiences a physiological response to a particular circumstance (Kim & Diamond, 2002). Secondly, if given the choice to avoid a particular circumstance, a person experiencing anxiety would choose to avoid the circumstance completely. Lastly, there is the feeling of losing control over the particular circumstance. In fact, the more powerless a person feels over a particular circumstance, the more anxiety is experienced (Kim & Diamond, 2002; Folkman et al., 1987). When all three of these components are present—a physiological response, a desire to avoid a particular circumstance, and loss of control— one is experiencing anxiety.

It is also important to note that anxiety can only be understood when looking at both the particular person and the particular circumstance. Analysis of the anxiety must take place when considering both of these pertinent subsystems (Folkman et al., 1987). A particular circumstance

cannot be considered the source of anxiety unless a person who cognitively has characteristics making them vulnerable to that particular circumstance experiences it. What causes a high degree of anxiety in one person may not affect another at all due to their personality, beliefs, personal goals, or their particular mindset. Similarly, a person or characteristic within a person cannot be considered the source of anxiety unless it contains a challenge that prevents that particular person from achieving a desired goal. If a person does not have much at stake despite a circumstance that would otherwise be a stressful environment, that person will not experience anxiety (Folkman et al., 1987).

**Acute stress**. In general, there are two types of stress: acute stress and chronic stress. Acute stress occurs momentarily. In small doses, acute stress can actually be exhilarating or even life-saving (Medina, 2008; Miller et al., 1993). Athletes experience acute stress when they need a peak performance. Students may experience acute stress as an assignment's deadline is quickly approaching. Healthy stress actually helps individuals overcome challenges and threats. However, when it comes to stress, our bodies were designed to solve problems that last for seconds, not for extended periods of time (Medina, 2008). When acute stress is experienced in large doses, it can lead to a variety of symptoms including back pain, heartburn, diarrhea, constipation, irritable bowel syndrome, tension headaches, anger, irritability, and depression. Continued doses of acute stress can lead to dizziness, a rise in blood pressure, chest pain, heart palpitations, and a shortness of breath (Miller, 1993; Natvig & Albrektsen, 1999).

**Chronic stress**. When stress is experienced over a long period of time and is frequent, relentless, and grinding, it can become quite harmful both physically and psychologically. This is called chronic stress (Miller et al., 1993). Often times, chronic stress is exhibited when someone cannot see his or her way out of a difficult, long-lasting circumstance. As opposed to acute

stress, which is often times very noticeable by the person experiencing this type of stress, people experiencing chronic stress can actually forget about it altogether. They get used to it (Miller et al., 1993). Chronic stress also takes its toll on the body's immune system. Those experiencing chronic stress are sick more often and are more likely to have asthma, diabetes, and autoimmune disorders (Medina, 2008). It can also play havoc on the brain's ability to learn. First, chronic stress keeps people from being able to process language efficiently. Secondly, both short-term and long-term memories are affected among those experiencing chronic stress. Thirdly, it diminishes one's ability to adapt old information to new circumstances. Lastly, chronic stress inhibits one's ability to focus (Medina, 2008). "Clearly, stress hurts learning. Most important, however, stress hurts people" (Medina, 2008, p. 180). Symptoms of chronic stress are severe, and include: heart attacks, strokes, violent outbursts, and suicide (Miller, 1993).

***Academic anxiety***. High school students, perhaps more now than ever, are experiencing dangerous levels of academic anxiety that, in turn, are risking the mental and physical health of our students (Pope & Simon, 2005). A variety of reasons can be blamed for this anxiety, but recent studies seem to indicate that our schools could actually be a key culprit for these unhealthy levels of anxiety. In a recent mixed methods study of 3,645 high school students attending Bay Area schools in Northern California, many students reported that they were highly anxious, overworked, and were routinely experiencing sleep deprivation (Conner et al., 2009). Of the respondents, 70% were always or often always stressed about schoolwork while another 56% were stressed over the college acceptance process. Respondents were also receiving far less sleep than recommended by the National Sleep Foundation (2011). Whereas the recommended amount of sleep for adolescents is 9.25 hours, respondents to this survey averaged 6.8 hours of

sleep with over 34% getting an average of less than 6 hours of sleep per night. For most (67%), sleep was minimized regularly due to the amount of schoolwork (Conner et al., 2009).

***Chronic academic anxiety***. When students experience prolonged and heightened levels of academic anxiety, this chronic anxiety can lead to dangerous and sometimes long-lasting consequences. In a quantitative study from 1994-1998 among 862 Norwegian 7th, 8th, and 9th grade students, academic anxiety was consistently associated with psychosomatic symptoms (Natvig & Albrektsen, 1999). In the study, a strong positive correlation was found between students who reported academic anxiety with feeling low, irritable, nervous, or having difficulty sleeping (Natvig & Albrektsen, 1999). In a 2009 study incorporating 3,287 North American self-reporting teens, the analysis of the surveys linked academic anxiety to increased levels of drug and alcohol use (2009 Parents and Teens Attitude Tracking Study Report, 2013).

**Theories of intelligence**. While many scholars have continued to define intelligence, during the past few decades others have begun the task of studying individuals' implicit theories of intelligence. Implicit theories of intelligence are the beliefs a person holds, either consciously or unconsciously, about aspects of intelligence, how intelligence is developed, or whether or not intelligence can even be developed in the first place. Research surrounding implicit theories of intelligence provides the conceptual framework for this study, in particular the concept of one's mindset as articulated and researched by Dweck and associates (Dweck, 2006). Dweck's focus has not been to define human intelligence per se, but instead to understand patterns and behavior that may be caused by one's own personal views and theories of intelligence.

***Mindset***. According to Dweck, each individual has a particular *mindset*. More accurately, each person can be placed on a spectrum ranging from *fixed mindset* to *growth mindset*. Those with a fixed mindset understand levels of intelligence, ability, and creativity to be fixed. Those

with a fixed mindset believe that there is only a certain amount of intelligence, ability, and creativity that each person possesses and not much, if anything, can be done to expand or to shrink these characteristics. Conversely, those with a growth mindset believe people can incrementally grow in intelligence, ability, and creativity through time, dedication, and hard work (Dweck, 2006).

Research has demonstrated that there are often widely contrasting results between a growth mindset and a fixed mindset. Contrasting results include the creation of performance goals versus learning goals (Dweck & Leggett, 1988; Elliott & Dweck, 1988; Mangels et al., 2006), contrasting responses to failure (Dweck, 2006; Moser et al., 2011; Plaks & Stecher, 2007), different viewpoints regarding the need for effort and hard work (Dweck, 2006, 2010; Elliott & Dweck, 1988), and contrasting longitudinal results in terms of academic achievement (Aronson et al., 2002; Good et al., 2003; Mangels et al., 2006).

***Failure and effort.*** Evidence suggests that one's mindset may determine their level of resiliency. Studies indicate that those with a fixed mindset view failure and negative feedback much differently than those with a growth mindset (Blackwell et al., 2007; Plaks & Stecher, 2007). Those with a fixed mindset typically see mistakes and failures as a reflection of their lack of intelligence. Worse still for those with a fixed mindset is the idea of exerting effort and still experiencing failure—for this leaves them without excuse (Dweck, 2006). Individuals with a fixed mindset receive criticism or negative feedback, especially following the exertion of effort, as the end of the road (Dweck, 2006; Moser et al., 2011; Plaks & Stecher, 2007).

Conversely, individuals with a growth mindset typically see failure as an opportunity to grow, to learn, and to improve (Dweck, 2006; Plaks & Stecher, 2007). As previously discussed regarding personal achievement goals, the learning-oriented goals created and sustained by those

with a growth mindset focus on learning and improving. Radically different than those with a fixed mindset, those with a growth mindset believe effort is the key to success (Moser et al., 2011). It is their belief in the importance of effort and toil that allows those with a growth mindset to view failure, as disappointing and painful as it may be, as a motivational impetus to continued learning, growth, and eventual success (Blackwell et al., 2007; Dweck, 2006; Plaks & Stecher, 2007). Furthermore, those with a growth mindset are highly interested in hearing feedback, even though the feedback may be negative in nature (Trope & Liberman, 2003).

***Performance goals vs. learning goals.*** Studies also suggest a wide contrast between those with a fixed mindset and those with a growth mindset in terms of their own personal achievement goals (Dweck & Leggett, 1988; Elliott & Dweck, 1988). Those with a growth mindset typically develop and maintain learning-focused goals. These types of learning-focused goals are mastery-oriented and place tremendous importance upon personal growth, the development of knowledge, and continued improvement (Dweck, 1986; Elliott & Dweck, 1988). Conversely, those with a fixed mindset typically have performance-focused goals. These types of performance-focused goals are typically task-oriented and place emphasis upon measuring up to a certain standard with the purpose of proving the worth, talent, or intellect (Elliott & Dweck, 1988). As opposed to mastery-orientation, the behavior pattern found to be typically associated with this type of learning goal is *helplessness* (Diener & Dweck, 1978, 1980; Dweck, 1975; Dweck & Leggett, 1988). As it relates to this study, in addition to this characteristic of learned helplessness, those with a fixed mindset and the resulting performance-oriented goals remain highly vulnerable to any type of criticism or negative feedback (Mangels et al., 2006).

This correlation between one's mindset and a one's response pattern provides the conceptual framework for this study. For students who are involved in the college application

process, particularly those applying to highly-selective institutions, navigating the many challenges and obstacles can be tremendously demanding (Chace, 2013). Is it possible that students with a helpless response pattern experience higher levels of anxiety because these challenges must be faced rather than avoided? Is it also possible that those with a mastery-oriented response pattern experience lower levels of anxiety because of their propensity to accept and even pursue challenging experiences?

**Methods**

A quantitative, non-experimental approach was utilized to discover the relationship between two known and measurable variables: mindset (Blackwell et al., 2007; Dweck, 1995, 2006; Hong et al., 1999; Rattan et al., 2012; Spinath et al., 2003) and anxiety (Brownlow et al., 2000; Cassady & Johnson, 2002; Ellis & Hudson, 2010; Grös et al., 2007; Martocchio, 1994; Mattoo & Nabi, 2012). Both of the study's variables have been well established in literature as measureable constructs. Therefore, conducting a quantitative analysis to assess their relationship was the best-suited approach for this study.

The purpose of this quantitative study was to discover whether there is a relationship between the mindset of a high school senior attending a private, independent, college-preparatory school and their levels of academic anxiety specifically during the college application process. In addition, the study also assessed what, if any, relationship exists between the mindset of a parent/guardian and the levels of academic anxiety as experienced by their student specifically during the college application process. Lastly, the study also explored the relationship between a student's mindset and their parent/guardian's mindset. Other variables within the scope of the study included a student's gender, race, GPA, highest SAT score, highest ACT score, the number of colleges receiving an application from the student, and whether students applied to any

selective colleges.

Four private, independent, college-preparatory high schools from southern California agreed to participate in this study. Each of the four schools agreed to allow email invitations to be sent to the parents or guardians of each of their current seniors. In total, families of 538 high school seniors received invitations to participate in this study. There were two separate surveys, one intended for parents and the second intended for their student(s). In total, 95 parents or guardians completed the Parent Survey, and of those 95 families, 26 high school seniors completed the Student Survey.

The Parent Survey measured the parent's mindset through the Intelligence Domain (Implicit Theories Questionnaire or ITQ) as well as their emotional stability through the TIPI. For the participating seniors, the survey included the Intelligence Domain of the ITQ to measure their mindset, the STICSA to measure students' levels of anxiety, as well as demographic information about the students.

**Key Findings**

The collection and analysis of the study's data resulted in five key findings. First, the data revealed no significant correlation between student anxiety and either student mindset or parent mindset. This data suggests that mindset may not have an effect on anxiety, in particular during the college application process.

Second, a statistically significant moderate correlation was discovered ($r = .50; p < .05$) between a parent's mindset and their student's mindset. This suggests a parent's specific mindset, whether fixed or growth, has an effect on their student's mindset.

Third, data revealed a statistically significant moderate correlation between the number of college applications a student had completed and their levels of overall anxiety ($r = .50; p <$

*.05*). This data suggests that students either complete more college applications because of increased anxiety or that an increased number of college applications raises the level of student anxiety.

Fourth, there was an inverse, statistically significant weak correlation between the parent's TIPI (emotional stability) scores and their student's mindset ($r = -.41; p < .05$). Keeping in mind that this was a weak correlation, this data may suggest that the more emotionally stable a parent may be, the more their student tends to have a fixed mindset.

Fifth, there were no significant correlations between either student or parent mindset and academic achievement as measured by student GPA, ACT scores, or SAT scores. As mentioned in the literature review in Chapter 2, there have been numerous studies that have given evidence of strong correlations between a growth mindset and higher levels of academic achievement (Aronson et al., 2002; Good et al., 2003). However, the strongest correlations between these variables had been found in minority students and among students with a low socioeconomic background (Aronson et al., 2002; Good et al., 2003). As detailed in Table 9 in Chapter 4, most of the participants for this study were white and it can be assumed, due to the high tuition costs associated with each of the involved schools, that most of the students were not from a low socioeconomic background. Therefore, the students in this study lived under different SES conditions and were of different ethnic backgrounds than students involved in previous studies.

**Conclusions with Implications and Recommendations**.

First, there is insufficient evidence to support that a student's mindset is a determinant of his or her own anxiety during the college application process. Second, there is insufficient evidence to support that the parent's mindset is a determinant of their child's anxiety during the college application process. The third conclusion that can be made is that parental and student

mindset are indeed associated with each other. In the following sections, for each of the conclusions, is a discussion of implications both for scholarship and for practice.

**Conclusion 1**: **There is insufficient evidence to support that a student's mindset is a determinant of his or her own anxiety during the college application process.** Although much has been researched in the area of implicit theories of intelligence and mindset, very few studies have attempted to discover the relationship between mindset and anxiety. In particular, there have been no known studies specifically involving high school students, mindset, and anxiety. With that being said, this research can be found somewhat contradictory to some previous research.

In previous research, those with a fixed mindset have been found to view their own mistakes as a personal threat to their levels of ability and intelligence (Bandura, 1991; Martocchio, 1994; Dweck, 2006). Theoretically, these threats may lead to increased levels of anxiety, especially when these threats are not effectively managed, because those with a fixed mindset tend to focus more on their deficiencies rather than on their accomplishments and growth (Martocchio, 1994; Bandura, 1991).

One of the keys to finding increased levels of anxiety for those with a fixed mindset have to do with their mistakes and threats not being effectively managed. For this current study, students may have been able to manage their mistakes and threats effectively, either on a personal level, or in conjunction with help from others such as their parents or from school staff. For example, many independent, private, college-preparatory high schools, including each of the participating high schools in this study, have extremely successful and effective college counselors who are able to help students negotiate through past mistakes and to present their mistakes in such a way to colleges as to not limit their chances of college acceptance. If their

mistakes and threats are effectively managed, this may diminish the possibility of increased levels of anxiety.

Secondly, insufficient evidence to support a relationship between a student's mindset and their levels of experienced anxiety may be explained if students are not experiencing each of the components necessary for anxiety. As mentioned earlier, researchers have found there to be three components to anxiety—a physiological response, a desire to avoid a particular circumstance, and loss of control (Kim & Diamond, 2002). This second component—the desire to avoid a particular circumstance—may not have been present in each of the student participants. For this current study, student participants may not have chosen to avoid the college application process at all. In fact, many of the participants may have been looking forward to graduation from high school and having the opportunity to begin at college. The third component of anxiety—a loss of control—may also have been absent from students. Due to the coaching received from their parents and college counselors, it may be the fact that the students were confident in what they were doing in the college application process thus allowing them to not experience any loss of power. When these three components are all present, stress is being experienced. However, if even one of these components is not present, stress is not being experienced. This may have been the case for this particular study.

***Recommendations for research.*** In order to establish sufficient evidence as to the relationship between mindset and student anxiety, there are several recommendations for future research. First, one of the limitations to this study was the number of participant pairs ($N = 26$). Although 95 parents completed the surveys from the 4 participating high schools, only 26 students from those 95 families completed the survey. The low number of participants stymied the potential for this study to provide statistical significance in the correlation between mindset

and anxiety. Second, it is recommended that future research in this area follow another type of methodology. The current study only provided a single point of reference into the lives of students through this one-time-only survey. Other studies seeking to measure anxiety levels among students have employed methods such as the use of daily surveys over the course of two weeks (Compton et al., 2008). Methods such as these may allow for the collection of more accurate data from students about their levels of anxiety.

***Recommendations for practice.*** Although this study was not able to come to a conclusion in regard to the relationship between anxiety and mindset, it is still highly recommended that parents, schools, and communities continue promoting a growth mindset among its youth. There are many positive effects of having a growth mindset, effects that have and continue to be substantiated with empirical evidence. To name a few of these positive effects, a growth mindset promotes learning goals (Dweck & Leggett, 1988; Elliott & Dweck, 1988; Mangels et al., 2006), allows for healthier responses to challenges and failures (Dweck, 2006; Moser et al., 2011; Plaks & Stecher, 2007), and promotes resilience, effort, and hard work (Dweck, 2006, 2010; Elliott & Dweck, 1988). Although this study cannot substantiate the relationship between mindset and anxiety, there are so many other benefits of a growth mindset that this should most certainly continue to be taught to our youth.

**Conclusion 2**: **There is insufficient evidence to support that the parent's mindset is a determinant of their child's anxiety during the college application process**. There are unquestioningly an endless variety of possible variables that may lead to the experience of unhealthy anxiety. As mentioned earlier, what causes a high degree of anxiety in one person may not affect another at all due to their personality, beliefs, personal goals, or their particular mindset (Folkman et al., 1987). Because there are so many contributing factors to anxiety, even

if a parent's mindset affects their child's level of experienced anxiety, it may not be one of the most contributing of overall factors.

***Recommendations for research***. In order to establish sufficient evidence as to the relationship between a parent's mindset and their child's experienced levels of anxiety, more research is needed. First, as mentioned in the above section focused on student mindset and anxiety, future research on this subject needs a larger number of student and parent participants. Second, it is also recommended a different methodology be employed to gain a more accurate perception of the anxiety being experienced by students. As mentioned above, a 2-week daily survey for students to complete regarding the stressors and experienced anxiety may prove to be more accurate. Third it is also recommended that all parents be surveyed for their particular mindset. For this study, only the mindset of one parent was tested. This specific method did not allow for multiple parents, multiple mindsets, broken homes, multiple guardians, etc. Each of these recommendations could aid in helping to establish sufficient evidence as to the relationship between a parent's mindset and their child's level of anxiety.

***Recommendations for practice***. Due to Conclusion 3, it is recommended that schools attempt to not only teach students about the importance of having a growth mindset, but also to be teaching parents as well. In addition to this, it is also recommended that teachers, school leaders, and district officials seek to find other means by which to reduce unhealthy levels of anxiety among its students, including, but not limited to the following: educating students about the importance of sleep, brain malleability, study skills, and the difference between healthy and unhealthy levels of stress. In addition, there are a number of strategies and policies that can be adopted by schools and districts that can not only decrease unhealthy levels of anxiety, but that can also increase levels of academic achievement. Such strategies include the creation of daily

schedules that allow for students to study and work with teachers, that decrease the amount of times students move from one place to another, and the development of a test calendar so that students are not taking a multitude of difficult assessments on the same day.

**Conclusion 3**: **Parental and student mindset are associated with each other.** As mentioned above in Key Findings, a moderate correlation of statistical significance was discovered ($r = .50, p < .05$) between a parent's mindset and their student's mindset. This suggests a parent's specific mindset, whether fixed or growth, has an effect on their student's mindset. However, this successful transference of mindset does not occur within each family. Nor does this always take place with any value or belief. Studies point to several parental factors in regard to this successful transference of values and beliefs from one generation to the next (Knafo & Schwartz, 2003). Several factors of parenting allow for a more successful transference: parental consistency over time, parental warmth and responsiveness, as well as parents' actual and perceived value agreement (Knafo & Schwartz, 2003). However, as researchers explain, both parents and students play an important role in the passing off of values and beliefs.

The importance of having a growth mindset and the correlation between parent and student mindset once again reiterates the need for successful partnerships between schools and parents. As Epstein writes, "Without partnerships, educators segment students into the school child and the home child, ignoring the whole child" (Epstein, 2011, p. 5). For the development of the whole child and of a growth mindset, it is imperative that schools build strong partnerships with their parents.

***Recommendations for research***. First and foremost, more studies and participants are needed to further verify the correlation and statistical significance of the relationship between parent mindset and student mindset. To discover the generalizability of this finding, it is

recommended that studies extend beyond southern California, beyond the college application process at private high schools, and beyond high school seniors. This study had a small sample size, represented more females than males, represented a majority of Caucasian students, and assumed moderate to high SES status. It is also recommended that further research be conducted with a larger sample size to better assess whether there actually is a relationship between mindset and anxiety. While one finding of this study showed a significant correlation ($r = .50; p < .05$) between the student's anxiety and the number of applications being completed, additional studies are needed to further explore whether students completed more applications because of increased levels of anxiety or if completing more college applications leads to increased levels of student anxiety.

***Recommendations for practice***. As part of the important partnership between schools and families, opportunities must be provided for parents and guardians to be educated about growth mindset. Strategies and resources should be given to parents to help aid in developing a growth mindset among their children. Second, through partnership and education of families, schools should encourage healthy parenting so that positive values and beliefs are successfully passed along to the next generation.

**Study Validity and Limitations**

There were several limitations to this study. First, there were only a minimal number of student/parent pairs ($N = 26$). This made it difficult to assess for significant relationships. The low number of pairs was mostly due to the low response rate among the students themselves (see Table 9). This low response was not necessarily a surprise as high school aged students are a difficult demographic from which to gain responses (Richards et al., 2010), in particular during their senior year and the development of *senioritis*, a common phenomenon seen by parents and

educators. In addition, students are often times extremely busy as they balance a heavy workload at school, high school and club sports, clubs and organizations, friends, family, and church events. Another limitation to this study was that the survey process relied upon voluntary self-reporting of perceptions. In addition, the survey process occurred during the month of February which may not be the point of highest anxiety during the college application process for many seniors. Some students may have already heard if they were accepted through "early action" or due to scholarships.

During the collection and analysis of data, several steps were taken to ensure the internal validity of the study and its data. First, valid and reliable surveys were used to gather data. To support the data gathering process, all survey items were carefully reviewed within Qualtrics, the electronic survey tool through which parents and students participated in the survey, prior to export of data for analysis. Data was directly exported from Qualtrics to IBM's Statistical Package for the Social Sciences (SPSS) software. In the matching of parents with students, random individual codes were given to parents automatically through Qualtrics and were communicated by parents to their students. These *Family ID Codes* remained within the data to ensure the accuracy of the pairing of parents with their students.

Internal validity was also ensured through a rigorous process to ensure analysis of data was handled properly. Numerous reviews of the raw data, analysis procedures and presentation of findings occurred.

**Concluding Remarks**

High school students attending public, private, and charter schools are experiencing unhealthy levels of anxiety at higher rates than ever. This unhealthy anxiety is having tremendously dangerous consequences both physically and psychologically. Parents, schools,

districts, psychologists, organizations, school boards, and researchers are desperately looking for answers that can decrease levels of unhealthy anxiety. This study was but a small part of this hopefully ever-growing movement to find solutions.

In particular, this study sought to discover the relationships between student mindset, parent mindset, and student anxiety. Although evidence was insufficient in the attempt to discover correlations between many of these variables, the study did reveal a moderate correlation of statistical significance between parent mindset and student mindset. This finding reiterates the importance of developing a strong partnership between the school and its families in order to educate and support our families and our students in teaching them about the importance of having a growth mindset.

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APPENDIX A

STICSA: Your Mood at This Moment

Ref _____ Date _____

# STICSA
## Your Mood at This Moment

Below is a list of statements which can be used to describe how people feel. Beside each statement are four numbers which indicate the degree with which each statement is self-descriptive of your mood at this moment (eg, 1 = not at all, 4 = very much so). *Please read each statement carefully and circle the number which best indicates* ***how you feel* right now, at this very moment, *even if this is not how you usually feel*.**

| | Not at all | A little | Moderately | Very much so |
|---|---|---|---|---|
| ***In general.....*** | | | | |
| 1. My heart beats fast | 1 | 2 | 3 | 4 |
| 2. My muscles are tense | 1 | 2 | 3 | 4 |
| 3. I feel agonised over my problems | 1 | 2 | 3 | 4 |
| 4. I think that others won't approve of me. | 1 | 2 | 3 | 4 |
| 5. I feel like I'm missing out on things because I can't make up my mind soon enough | 1 | 2 | 3 | 4 |
| 6. I feel dizzy. | 1 | 2 | 3 | 4 |
| 7. My muscles feel weak | 1 | 2 | 3 | 4 |
| 8. I feel trembly and shaky | 1 | 2 | 3 | 4 |
| 9. I picture some future misfortune. | 1 | 2 | 3 | 4 |
| 10. I can't get some thought out of my mind. | 1 | 2 | 3 | 4 |
| 11. I have trouble remembering things | 1 | 2 | 3 | 4 |
| 12. My face feels hot | 1 | 2 | 3 | 4 |
| 13. I think that the worst will happen. | 1 | 2 | 3 | 4 |
| 14. My arms and legs feel stiff | 1 | 2 | 3 | 4 |
| 15. My throat feels dry | 1 | 2 | 3 | 4 |
| 16. I keep busy to avoid uncomfortable thoughts. | 1 | 2 | 3 | 4 |
| 17. I cannot concentrate without irrelevant thoughts intruding | 1 | 2 | 3 | 4 |
| 18. My breathing is fast and shallow | 1 | 2 | 3 | 4 |
| 19. I worry that I cannot control my thoughts as well as I would like to. | 1 | 2 | 3 | 4 |
| 20. I have butterflies in the stomach. | 1 | 2 | 3 | 4 |
| 21. My palms feel clammy | 1 | 2 | 3 | 4 |

# APPENDIX B

## STICSA: General Mood Questionnaire

Ref _____ Date _____

**STICSA**
**General Mood Questionnaire**

Below is a list of statements which can be used to describe how people feel. Beside each statement are four numbers which indicate *how often* each statement is true of you (eg, 1 = almost never, 4 = almost always). *Please read each statement carefully and circle the number which best indicates* **how often, *in general, the statement is true of you.***

| | Almost never | Occasionally | Often | Almost always |
|---|---|---|---|---|
| ***In general.....*** | | | | |
| 1. My heart beats fast | 1 | 2 | 3 | 4 |
| 2. My muscles are tense | 1 | 2 | 3 | 4 |
| 3. I feel agonised over my problems | 1 | 2 | 3 | 4 |
| 4. I think that others won't approve of me. | 1 | 2 | 3 | 4 |
| 5. I feel like I'm missing out on things because I can't make up my mind soon enough | 1 | 2 | 3 | 4 |
| 6. I feel dizzy. | 1 | 2 | 3 | 4 |
| 7. My muscles feel weak | 1 | 2 | 3 | 4 |
| 8. I feel trembly and shaky | 1 | 2 | 3 | 4 |
| 9. I picture some future misfortune. | 1 | 2 | 3 | 4 |
| 10. I can't get some thought out of my mind. | 1 | 2 | 3 | 4 |
| 11. I have trouble remembering things | 1 | 2 | 3 | 4 |
| 12. My face feels hot | 1 | 2 | 3 | 4 |
| 13. I think that the worst will happen. | 1 | 2 | 3 | 4 |
| 14. My arms and legs feel stiff | 1 | 2 | 3 | 4 |
| 15. My throat feels dry | 1 | 2 | 3 | 4 |
| 16. I keep busy to avoid uncomfortable thoughts. | 1 | 2 | 3 | 4 |
| 17. I cannot concentrate without irrelevant thoughts intruding | 1 | 2 | 3 | 4 |
| 18. My breathing is fast and shallow | 1 | 2 | 3 | 4 |
| 19. I worry that I cannot control my thoughts as well as I would like to. | 1 | 2 | 3 | 4 |
| 20. I have butterflies in the stomach. | 1 | 2 | 3 | 4 |
| 21. My palms feel clammy | 1 | 2 | 3 | 4 |

# APPENDIX C

## Implicit Theories Questionnaire

**Original Implicit Theories Questionnaire (ITQ)**

1. How intelligent you are, is hardly or not at all changeable by yourself.
2. How intelligent you are, depends mainly on your own effort.
3. How intelligent you are, cannot by influenced by yourself.
4. If someone is not very intelligent as a child, he or she cannot be very intelligent as an adult even if he or she tries to.

**Adaptation of the Implicit Theories Questionnaire (ITQ) for this study**

1. How intelligent you are is not changeable by yourself.
2. How intelligent you are depends mainly on your own effort.
3. You cannot influence how intelligent you are.
4. If someone is not very intelligent as a child, he or she cannot be very intelligent as an adult even if he or she tries to.

# APPENDIX D

## Demographic Questions

What is your gender?
- Male
- Female

Are you of Hispanic, Latino, or Spanish origin?
- No, not of Hispanic, Latino, or Spanish origin
- Yes, Mexican, Mexican American, Chicano
- Yes, Puerto Rican
- Yes, Cuban
- Yes, another Hispanic, Latino, or Spanish origin

What is your race?
- White
- Black, African American, or Negro
- American Indian or Alaska Native
- Asian Indian
- Chinese
- Filipino
- Japanese
- Korean
- Vietnamese
- Other Asian
- Native Hawaiian
- Guamanian or Chamorro
- Samoan
- Other Pacific Islander
- Other

What is your highest ACT score?
- 28 or more ($90^{th}$ percentile)
- 25-27 ($75^{th}$ percentile)
- 20-24 ($50^{th}$ percentile)
- Less than 20 ($25^{th}$ percentile)
- Not applicable, I have  not taken the ACT

What is your highest SAT score?
- 1930 or more ($90^{th}$ percentile)
- 1720 to 1920 ($75^{th}$ percentile)
- $50^{th}$: 1490 to 1710 ($50^{th}$ percentile)

- Less than 1490 (25th percentile
- Not applicable, I have not taken the SAT

What is your current, non-weighted, cumulative (9th – 12th grade) GPA?

- 3.75-4.0
- 3.5-3.75
- 3.25-3.5
- 3.0-3.25
- 2.75-3.0
- 2.5-2.75
- 2.49 or below

Have you applied to one or more of the following colleges or universities?
Alice Lloyd College

- Amherst College
- Barnard College
- Berea College
- Bowdoin College
- Brown University
- California Institute of Technology
- Claremont McKenna College
- College of the Ozarks
- Columbia University
- Cooper Union
- Cornell University
- CUNY—Baruch College
- CUNY—Lehman College
- Curtis Institute of Music
- Dartmouth College
- Duke Universtiy
- Florida Memorial University
- Franklin W. Olin College of Engineering
- Georgetown University
- Harvard University
- Harvey Mudd College
- Johns Hopkins University
- Julliard School
- LeMoyne-Owen College
- Liberty University
- Lincoln University
- Massachusetts Institute of Technology (MIT)
- Middlebury College
- Mississippi Valley State University
- Northwestern University

- Pitzer College
- Pomona College
- Princeton University
- Rice University
- Stanford University
- Swarthmore College
- Tufts University
- Tulane University
- United States Air Force Academy
- United States Coast Guard Academy
- United States Merchant Marine Academy
- United States Military Academy
- United States Naval Academy
- University of California—Berkeley
- University of Chicago
- University of Notre Dame
- University of Pennsylvania
- University of Southern California
- Vanderbilt University
- Vassar College
- Washington and Lee University
- Washington University in St. Louis
- Wesleyan University
- Williams College
- Yale University

# APPENDIX E

## Highly Selective Colleges, Universities, and Academies

Amherst College
Barnard College
Berea College
Bowdoin College
Brown University
California Institute of Technology
Claremont McKenna College
College of the Ozarks
Columbia University
Cooper Union
Cornell University
CUNY-Baruch College
CUNY-Lehman College
Curtis Institute of Music
Dartmouth College
Duke University
Florida Memorial University
Franklin W. Olin College of Engineering
Georgetown University
Harvard University
Harvey Mudd College
Johns Hopkins University
Julliard School
LeMoyne-Own College
Liberty University
Lincoln University
Massachusetts Institute of Technology
Middlebury College
Mississippi Valley State University
Northwestern University
Pitzer College
Pomona College
Princeton University
Rice University
Stanford University
Swarthmore College
Tufts University
Tulane University
US Air Force Academy
US Coast Guard Academy
US Merchant Marine Academy
US Military Academy
US Naval Academy
University of California-Berkeley
University of Chicago
University of Notre Dame
University of Pennsylvania
University of Southern California
Vanderbilt University
Vassar College
Washington and Lee University
Washington University in St. Louis
Wesleyan University
Williams College
Yale University

# APPENDIX F

## IRB Approval Letter

PEPPERDINE UNIVERSITY

Graduate & Professional Schools Institutional Review Board

January 29, 2014

**Protocol #:** E1213D06
**Project Title:** A Quantitative Study Measuring the Relationship between Student Mindset, Parent Mindset, and Anxiety as Experienced by High School Seniors

Dear Mr. Northrop:

Thank you for submitting your application *A Quantitative Study Measuring the Relationship between Student Mindset, Parent Mindset, and Anxiety as Experienced by High School Seniors*, for expedited review to Pepperdine University's Graduate and Professional Schools Institutional Review Board (GPS IRB). The IRB appreciates the work you and your advisor, Dr. Davis, completed on the proposal. The IRB has reviewed your submitted IRB application and all ancillary materials. As the nature of the research met the requirements for expedited review under provision Title 45 CFR 46.110 (Research Category 7) of the federal Protection of Human Subjects Act, the IRB conducted a formal, but expedited, review of your application materials.

I am pleased to inform you that your application for your study was granted **Full Approval.** The IRB approval begins today, **January 29, 2014, and terminates on January 29, 2015**. In addition, your application to waive documentation of informed consent has been **approved.**

Your final consent form has been stamped by the IRB to indicate the expiration date of study approval. One copy of the consent form is enclosed with this letter and one copy will be retained for our records**. You can only use copies of the consent that have been stamped with the GPS IRB expiration date to obtain consent from your participants.**

Please note that your research must be conducted according to the proposal that was submitted to the GPS IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For ***any*** proposed changes in your research protocol, please submit a Request for Modification form to the GPS IRB. Please be aware that changes to your protocol may prevent the research from qualifying for expedited review and require submission of a new IRB application or other materials to the GPS IRB. If contact with subjects will extend beyond **January 29, 2015**, a **Continuation or Completion of Review Form** must be submitted at least one month prior to the expiration date of study approval to avoid a lapse in approval.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite our best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the GPS IRB as soon as possible. We will ask for a complete explanation of the event and your response. Other actions also may be required depending on the nature of the event. Details regarding the timeframe in which adverse events must be reported to the GPS IRB and the appropriate form to be used to report this information can be found in the *Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual* (see link to "policy material" at http://www.pepperdine.edu/irb/graduate/).

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