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An examination of psychological disorders, social anxiety, and perfectionism in high-achieving undergraduate students

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AN EXAMINATION OF PSYCHOLOGICAL DISORDERS, SOCIAL ANXIETY, AND PERFECTIONISM IN HIGH-ACHIEVING UNDERGRADUATE STUDENTS

by

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Abstract

There is a long-standing debate on whether high-achieving students experience a better or worse psychological well-being than their peers. This retrospective cohort study adds to the current literature by examining the differences in rates of psychological disorders, social anxiety, and perfectionism between high-achieving and typical undergraduate students. A convenience sample of 357 students was gathered from the University of Central Florida (UCF). Participants were asked to fill out a brief survey which included questions about demographics, grade point average (GPA), social anxiety, perfectionism, enrollment in The Burnett Honors College, inclusion in any childhood gifted programs, and diagnosis of psychological disorders. Two groups (a High-Achieving group and a Comparison group) were formed based on GPA scores and enrollment in The Burnett Honors College at UCF. Relative risk and chi-squared analyses were conducted to see if there was a significant relationship between group classification and the incidence of psychological disorders, self-injury, and social anxiety. T-tests were used to compare group means of social anxiety and perfectionism. A statistically significant relationship was found between group classification and the incidence of psychological disorders, self-injury, and social anxiety ($p = .033$, $p = .028$, and $p < .001$). The High-Achieving group scored significantly higher on the SPAI-23 SP Subscale ($p = .032$), the SPAI-23 Difference Score ($p < .001$), and the APS-R Standards Subscale ($p < 0.001$). Altogether, the findings of this study indicate that High-Achieving undergraduate students experience a worse psychological well-being than their typical undergraduate student peers.

Dedication

To my grandfathers, who always believed in me and loved me unconditionally. I hope this and my future research endeavors make you proud.

To my family, who encouraged me every step of the way despite my various mood changes. Without you this would not be possible.

To my best friends, who made me take the occasional break from my writing. Thank you for keeping me sane.

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I also want to communicate my appreciation to The Burnett Honors College at the University of Central Florida for creating the Honors in the Major Program.

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List of Acronyms

APS-R DS	Almost Perfect Scale – Revised Discrepancy Subscale
APS-R OS	Almost Perfect Scale – Revised Order Subscale
APS-R SS	Almost Perfect Scale – Revised Standards Subscale
APS-R TS	Almost Perfect Scale – Revised Total Score
GPA	Grade Point Average
SAD	Social Anxiety Disorder
SPAI-23 AG	Social Phobia and Anxiety Inventory Agoraphobia Subscale
SPAI-23 DS	Social Phobia and Anxiety Inventory Difference Score
SPAI-23 SP	Social Phobia and Anxiety Inventory Social Phobia Subscale
UCF	University of Central Florida

Chapter 1: Introduction

Gifted Learners Versus High-Achieving Students

School Honors programs are typically composed of at least two types of students: gifted students and high-achieving students. It is important to note the difference. According to Szabos (1989), a high-achiever generates advanced ideas whereas a gifted learner generates complex, abstract ideas. A high-achiever works hard to achieve, memorizes well, knows the answers, and consistently receives A's. A gifted learner, on the other hand, knows without having to work hard, guesses and infers well, asks the questions, and might not be motivated by grades. High-achievers seem to prefer routine, whereas gifted learners tend to rebel against routine. Gifted learners also tend to be self-critical, while high-achievers tend to be pleased with their own learning. It is also important to note that many gifted individuals can share the same qualities as high-achievers, but most high-achievers do not satisfy the criteria to be classified as gifted.

Mental Health in the United States

According to the U.S. Department of Health and Human Services (1999), only 17% of adults in the United States are considered to be in a state of optimal mental health. Mental health disorders such as Major Depressive Disorder and Generalized Anxiety Disorder are chief among the reasons that adults may experience a poor state of mental health. In any given year,

26% of adults and 20% of children and adolescents in the United States suffer from one or more mental disorders (Kessler et al., 2005).

College students are certainly not exempt from mental health problems. Every year the American College Health Association surveys thousands of undergraduate students from around the United States and assembles an extensive report on college health trends. In 2011, they found that 23% of female and 17% of male undergraduate students had a diagnosable mental health condition. A little more than half of the surveyed undergraduate students reported feeling overwhelming anxiety in the last 12 months and 13% of males and 17% of females reported feeling hopeless in the last 2 weeks (American College Health Association, 2011). The report also showed that about 31% of undergraduates reported being so depressed at least once in the last 12 months that it was difficult to function (American College Health Association, 2011).

Mental Health of Gifted and High-Achieving Individuals

Do gifted/high-achieving individuals experience better psychological well-being than their peers? Or, does giftedness/high achievement increase vulnerabilities for psychological issues? There is a long history of research debating this topic and there is evidence to support both sides. Some researchers claim that "the gifted are capable of greater understanding of self and others due to their cognitive capacities and [they can] therefore cope better with stress, conflicts, and developmental dysynchrony than their peers" (Neihart, 1999, p.1). Other researchers claim that as a result of these increased cognitive capacities, "the gifted are more

sensitive to interpersonal conflicts and experience greater degrees of alienation and stress than do their peers" (Neihart, 1999, p.1).

Most studies on the psychological well-being of gifted and high-achieving individuals have focused on children and have shown that gifted and high-achieving children are at least as well and possibly better adjusted than their peers (Bracken, 1980; Gallucci, 1988; Nail & Evans, 1997). Despite the literature attesting to the strengths of giftedness and high achievement in childhood, Peterson and his team (2009) found that gifted youth admitted they felt self-conscious and inadequate, experienced social awkwardness and social deficits, got agitated over minor issues, let emotions build up inside, worried too much, and were too uptight.

Some evidence suggests that when compared to non-gifted peers, both gifted and high-achieving adolescents and adults experience a greater number of psychiatric disorders and specific psychological symptoms (Carman, 2011; Lewis et al., 1992; Suldo et al., 2008; Yadusky-Holahan & Holahan, 1983). However, an extensive literature review by Neihart (1999) shows that gifted individuals are a diverse population and that no conclusion on emotional well-being can be drawn for the group as a whole. Neihart (1999) suggests that the psychological well-being of gifted individuals is a multidimensional construct related to the age of the individual, the type of giftedness, the educational fit, the temperament and personality of the individual, and his/her specific life circumstances.

In 1983, Barbara Clark established an extensive list of characteristics that differentiates gifted individuals from their non-gifted peers. She suggested that the same attributes that

make an individual superiorly intelligent may also create a potential for concomitant problems such as being misunderstood by peers (as reported by Lewis et al., 1992).

Another individual, Kazimierz Dabrowski, defined five categories of "overexcitabilities" – intellectual, imaginational, emotional, sensual, and psychomotor (as reported by Lewis et al., 1992; see Table 1). Overexcitability can be defined as "a greater responsiveness and intensified sensitivity to sensory stimuli" (Carman, 2011, p. 415). Research shows that gifted individuals consistently score higher on 4 out of the 5 overexcitabilities - all of them except psychomotor (Lewis et al., 1992; Piechowski, 1986). Research shows that high-achieving individuals also score higher on some overexcitabilities than their peers. Lewis and his team (1992), for example, found that high-achieving college students often experience strong, extreme emotions (emotional overexcitability) and often feel isolated because they believe they have to keep these emotions in check in order to maintain positive social interactions.

Table 1: Dabrowski's Overexcitabilities

Overexcitability	Common Characteristic Behaviors
Intellectual	Avid reading, love of problem solving, desire for knowledge, persistence, and analytical thinking.
Imaginational	Vivid imagery, love of fantasy, inventiveness, daydreaming, and imaginary friends.
Emotional	Emotional extremes, strong sense of justice, concern for others, loneliness, depression, and anxiety.
Sensual	Appreciation of beauty, pleasure derived from the senses, and craving for such pleasure.
Psychomotor	Love of movement, impulsivity, sleeplessness, compulsive organizing, and high energy.

Note: Based on information from Carmen (2011) and Lewis et al. (1992).

History of Research on Perfectionism

Perfectionism is a trait commonly associated with both gifted and high-achieving individuals (Adderholt-Elliott, 1991; Dixon et al., 2004; Neumeister, 2004). Academically-talented students (or gifted and high-achieving students) are often influenced by high personal standards and by perceived pressure from peers, teachers, and parents to excel academically. These extra stressors may make them particularly vulnerable to perfectionistic tendencies (Adderholt-Elliott, 1991).

Originally, perfectionism was seen as a one-dimensional personality defect that caused affected individuals to be extremely self-critical and to strive for unrealistic and unattainable goals (Dixon et al., 2004). Several studies have focused on the negative aspects of perfectionism – its role in the development of personality disorders, eating disorders,

depression, anxiety, obsessive compulsion, negative self-esteem, etc. (Blatt, 1995; Kring et al., 2010; Peterson et al., 2009).

Researchers have come to view perfectionism as being a multi-dimensional construct, capable of producing both positive and negative functioning. Hamachek (1978) introduced two different types of perfectionism: neurotic and normal. Neurotic perfectionists hold themselves up to impossibly high standards. No matter how great their performance, they are never satisfied with their efforts because nothing they do is ever good enough. Neurotic perfectionists have low self-esteem and find little pleasure in life. Normal perfectionists, on the other hand, strive for excellence and get a feeling of satisfaction from the effort they put forth. They focus on their strengths and on organization, whereas neurotic perfectionists focus heavily on their weaknesses and demonstrate excessive concern over making mistakes (Hamachek, 1978). Dixon and her associates claimed that dysfunctional (or neurotic) perfectionists are "socially detached, anxious, moody, hostile and overly competitive," whereas healthy (or normal) perfectionists are "agreeable and conscientious, goal-oriented, socially at ease, well-adjusted, and not neurotic" (2004, p.97).

Hewitt and Flett (1991) further broke down dysfunctional (or neurotic) perfectionists into two categories: self-oriented perfectionists and socially-prescribed perfectionists. Self-oriented perfectionists set excessively high standards for themselves, whereas socially-prescribed perfectionists perceive a pressure from significant others to live up to lofty standards (Hewitt & Flett, 1991). Both self-oriented and socially-prescribed perfectionism have

been correlated with multiple mental health issues such as hypomania, depression, anxiety, avoidant and passive-aggressive tendencies, dysthymia, and learned helplessness (Hewitt & Flett, 1991; Neumeister, 2004).

Gifted Learners, High-Achievers, and Perfectionism

Most previous research on perfectionism in high-achieving or gifted individuals has focused on children (Peterson et al., 2009) and adolescents (Dixon et al., 2004; Flett et al., 2011; Peterson et al., 2009). Dixon and his associates (2004) studied a group of gifted high school juniors and seniors. They discovered four types of perfectionism pertaining to students: pervasive, mixed-maladaptive, mixed-adaptive, and non-perfectionist. The two maladaptive types (pervasive and mixed-maladaptive) are important to discuss, because they were associated with poor adjustment and mental health. Students with the pervasive type of perfectionism were well-organized but had strong doubts about their ability to complete tasks. Students with the mixed-maladaptive form of perfectionism were overly concerned about making mistakes, were not well-organized, and consistently set lower standards for themselves because they doubted their abilities. Both types complained of psychiatric problems such as obsessive-compulsive tendencies, depression, anxiety, and somatic symptoms (Dixon et al., 2004).

There is very little research on the relationship between perfectionism and high-achieving undergraduate students, but one study was found (Neumeister, 2004). In agreement with Hewitt and Flett (1991), Neumeister (2004) found that socially-prescribed perfectionists

held the belief that others had stringent expectations for them. From a young age, they experienced a strong fear of disappointing others. This belief led them to think their self-worth was based entirely on academic achievement. As a group, socially-prescribed perfectionists strove to be perfect to avoid disappointing others and to protect their own self-image. Self-oriented perfectionists, on the other hand, did not feel external pressures to achieve academically. Even when their families expressed concern that they were placing themselves under too much pressure, they continued to expect these high standards of themselves. As a group, self-oriented perfectionists noted that their perfectionism seemed to be a sort of inborn tendency, and they attributed most of the development of their perfectionism to having been relatively unchallenged in school (Neumeister, 2004).

Social Anxiety and Undergraduate Students

Social Anxiety Disorder (SAD; also known as Social Phobia) has a lifetime prevalence of about 12.1% and is defined as "a persistent, unrealistic, intense fear of social situations that might involve being scrutinized by, or even just exposed to, unfamiliar people" (Kring et al., 2010, p.122). Persons with Social Anxiety Disorder often feel extremely anxious in situations where they might experience embarrassment or be negatively evaluated by others. Situations that evoke anxious feelings include: eating in public, meeting new people, attending parties, using public restrooms, using the telephone, giving a speech, etc. Feared situations are often avoided altogether or endured with great anxiety and distress. Social anxiety exists on a continuum ranging from mild shyness to severe, clinical levels. It can be limited to one specific

situation (such as talking on the phone), or it may affect all aspects of life. First symptoms tend to appear during adolescence, but SAD can be found in children (Kring et al., 2010, p.123). If left untreated, it will most likely be a chronic disorder. Social anxiety has high rates of comorbidity and has been found to be highly correlated with perfectionism (Juster et al., 1996; Wheeler et al., 2011). At least 1 out of every 3 people with Social Anxiety Disorder also meet the criteria for Avoidant Personality Disorder, a more serious and pervasive disease (Chavira, Stein, & Malcarne, 2002).

Social anxiety and avoidance often lead to functional impairments affecting one's ability to work, achieve educational goals, and participate in daily activities (Roberson-Nay et al., 2007). People with Social Anxiety Disorder often work in occupations far below their talent levels (Kring et al., 2010, p.122). They would rather work at less-rewarding jobs that have limited social demands than work where they must face their extreme social fears on a daily and maybe even hourly basis.

Beidel and her colleagues (1989) found that the prevalence of Social Phobia among undergraduate college students may be as high as 19%. Social anxiety might be especially problematic in college students because it is often hard to identify unless the student is experiencing extreme distress. Due to the "fear of judgment," sufferers of social anxiety may be unlikely to seek treatment or professional help (Schry et al., 2012). Strahan (2003) reports that social anxiety may contribute to considerable amounts of dissatisfaction and discomfort in the overall undergraduate experience of high-achieving students. College students with social

anxiety are less assertive, prone to social isolation, and viewed by their peers as being much more vulnerable to threat (Schry et al., 2012). In addition, socially-anxious undergraduates may be likely to engage in alcohol consumption in order to decrease anxious feelings (Strahan, 2003). This can lead to very dangerous situations, including alcohol abuse and driving under the influence.

Mental Health Concerns and Honors Undergraduates

Research shows that most lifetime mental disorders first appear before age 24 (Hunt et al., 2009). College provides a great opportunity to identify and treat these disorders - teaching adults successful ways to cope in the future and helping them reach their full potentials.

However, Eisenberg and his team (2007) found that less than half of undergraduate students who tested positive for major depression or anxiety disorders received mental health services in the previous year. Despite the fact that attitudes toward seeking mental health treatment seem to have improved steadily in the last few years (Hunt et al., 2009), almost 30% of undergraduate students said they would not consider seeking help from a mental health professional even if they were really bothered by a personal problem (American College Health Association, 2011).

High-achieving undergraduate students may be particularly at risk for mental health problems. In addition to the evidence that they may experience a higher incidence of psychological issues, studies have shown that even when high-achieving students are highly distressed, they do not reveal their problems to trusted adults (Peterson & Ray, 2006).

Peterson (2000) found that adults are often unaware of a high-achieving student's level of distress because they tend to maintain high grades even during distressing life events. Equally as troubling, Sowa and May (1997) found that gifted individuals may claim to be well-adjusted even when their behavior shows the exact opposite. If academically-talented students hide a problem, do not seek help for a problem, or do not even know that they have a problem, how will they reach their optimal mental health, academic, and career potentials?

While there are a handful of studies that have focused on the mental health of undergraduate students in general, the researchers for this thesis were unable to find any studies that focused specifically on high-achieving undergraduate students or on the mental health differences between high-achieving and typical undergraduate students. The present study hopes to add to the literature by examining the presence of psychological disorders, social anxiety, and perfectionism among high-achieving and typical undergraduate students.

Chapter 2: Methodology

Study Design

This study was partly designed to be a retrospective cohort study. The researchers aimed to examine the association between a risk factor (high scholastic achievement) and the development of a disease (psychological disorder). This was accomplished by looking at the relationship between two different groups of undergraduate students and the incidence of reported psychological disorders within each group. Two groups were created: a High-Achieving group and a Comparison group (composed of typical undergraduate students). Students were placed into these groups based upon grade point average (GPA) and enrollment in The Burnett Honors College of the University of Central Florida (UCF). The primary research goal was to determine if there was a significant association between psychological disorders and high-achieving undergraduate students. The secondary research goal was to identify any patterns of social anxiety and perfectionism in these two groups of undergraduate students.

Experimental and Null Hypotheses:

H_1: There will be a statistically significant association between the UCF High-Achieving student population and reported psychological disorders.

H_0: There will be no association between UCF High-Achieving students and reported psychological disorders.

Alternative Hypotheses:

Ha_1: The UCF High-Achieving student population will have significantly higher rates of reported psychological disorders than the Comparison student population.

H_{a2}: The UCF High-Achieving student population will have significantly higher rates of social anxiety than the Comparison (Typical) student population.

H_{a3}: Perfectionism will be a statistically significant predictor of psychological disorders.

Sampling Methodology

This study was designed to determine if there is a significant association between high scholastic achievement and psychological disorders. The sample was taken from UCF and participants were placed into one of two groups: High-Achieving or Comparison (Typical). Group placement was based on GPA scores and enrollment in The Burnett Honors College of UCF. Since Honors programs are typically composed of gifted and high-achieving students, the research team assumed everyone currently enrolled in The Burnett Honors College fit this study's qualifications for being in the High-Achieving group. The team also assumed, though, that there were some high-achieving students who did not meet all of the requirements for entrance into The Burnett Honors College when they applied to UCF. High GPA scores were considered a measure of high-achievement in these students. For the purposes of this study, a student was considered a high-achiever if he/she had a cumulative GPA of 3.8 or higher. This cut-off GPA score was arbitrary.

If a student fit either of the above criteria (enrollment in The Burnett Honors College or a GPA of 3.8 or higher), they were included in the High-Achieving group. The Comparison group included typical UCF students who were not enrolled in The Burnett Honors College and who had a cumulative GPA less than 3.8 (see Table 2).

Table 2: Description of Group Classification

High-Achieving	All students enrolled in The Burnett Honors College and students not enrolled in The Burnett Honors College with a cumulative GPA ≥ 3.8.
Comparison (Typical)	Students not enrolled in The Burnett Honors College with a cumulative GPA < 3.8.

Typically the average age of undergraduate Honors students is less than the average age of undergraduate Non-Honors students. Because the High-Achieving group was likely to be composed of mostly Honors students, the research team was concerned about the possibility of a confounding variable due to age differences between groups. In an attempt to prevent this, only students aged 18 to 25 were allowed to participate in this study. Both males and females and all represented ethnicities were included.

The instrument of data collection was a survey. Non-probabilistic convenience sampling was employed. Students were targeted through UCF Sona Systems, an online research system that allows students to participate in psychological studies in return for participation credits or money. UCF offers more than 300 psychology classes during the fall semester. Many psychology professors (for both General Psychology courses and upper division courses) use

Sona Systems for “academic credit” either by requiring students to earn a certain number of survey credits for their course or by allowing them to earn extra credit. The researchers aimed to have at least 200 participants in each group for a total sample size of at least 400 students.

The Sona Systems sample generated plenty of students who fit the requirements for being in the Comparison group but only 44 students who fit the requirements for being in the High-Achieving group. The researchers decided to try to target high-achieving students by sending out a mass e-mail to The Burnett Honors College students. All students currently enrolled in The Burnett Honors College received two e-mails asking them to participate in a quick survey on the differences in mental health among different groups of undergraduate students. A link took them to Qualtrics, an online survey software system, and they typed in a password and completed the survey (the same survey that was on Sona Systems). This process generated an additional 74 students for the High-Achieving group.

Instrumentation and Measurement

The instrumentation of measurement for this study was a hybrid assessment tool of original questions developed by the research team and questions from two previously-existing and widely-accepted tools. The original questions on the survey included questions that targeted such things as: demographics, GPA, enrollment in The Honors College, inclusion in gifted programs, and diagnosis of psychological disorders. To see a list of the original survey questions and the specific psychological disorders that were included in the survey, see Appendix B.

Social anxiety was measured using the *Social Phobia and Anxiety Inventory – 23 (SPAI-23;* Roberson-Nay, Strong, Nay, Beidel, & Turner, 2007*).* Permission to use the SPAI-23 was given in person by Dr. Beidel, a professor at UCF. The SPAI-23 is a shortened version of the original *SPAI* (Turner, Beidel, Dancu, & Stanley, 1989) and is a widely-used measurement of social anxiety. It consists of 23 Likert-scale items measured on a 5-point scale ranging from never (1 point) to always (5 points). The test can be completed and scored in under three minutes. It includes two subscales: Social Phobia (16 items) and Agoraphobia (7 items). The overall score (or Difference Score) is calculated by adding up the total Social Phobia points and subtracting the total Agoraphobia points. This Difference Score was developed because individuals with Agoraphobia may experience anxiety in some of the same situations as individuals with SAD (Schry et al., 2012). By subtracting out scores on questions specific to Agoraphobia, the Difference Score eliminates this potential confounding variable. Thus, the Difference Score represents one's true social anxiety score.

A Difference Score of 28 or higher falls above the clinical threshold and is said to be indicative of possible Social Anxiety Disorder (Schry et al., 2012). This cut-off score has a sensitivity of about .96 and a specificity of about .39 for detecting generalized SAD. To reach a higher level of specificity, a cut-off score of 35 (which has a sensitivity of .92 and a specificity of .68) is suggested (Schry et al., 2012). For the purposes of this study, it was decided to use both of these suggested cut-off scores. Schry (2012) mentions that elevated levels of social anxiety are associated directly with alcohol-related problems and indirectly with marijuana-related

problems in college students. Another study found evidence that even those with sub-threshold forms of social anxiety experienced impaired social, occupational, and educational functioning (Dell'Osso et al., 2003). Thus, the research team chose to focus more attention on the lower cut-off score because it is important to indentify and treat those students with elevated levels of social anxiety, who are likely to experience some degree of impaired functioning without necessarily meeting the diagnostic criteria for having SAD.

When developing the SPAI-23, Roberson-Nay and her colleagues (2007) found that it reliably discriminated Social Anxiety Disorder from other anxiety disorders and did not differ significantly from the original SPAI which has repeatedly demonstrated strong psychometric properties. Schry and her associates (2012) found that the SPAI-23 demonstrated relatively strong psychometric properties itself: internal consistency for the Social Phobia and Agoraphobia subscales exceeded .90 and .80, respectively, and test-retest reliability was found to be between .72 and .78. The SPAI-23 has also shown convergent validity with other social anxiety measures including: the Social Avoidance and Distress Scale (SADS), the Social Interaction Anxiety Scale (SIAS), the Social Phobia Scale (SPS), and the Fear of Negative Evaluation scale (FNE) (Schry et al., 2012; Roberson-Nay et al., 2007).

Perfectionism was measured using the *Almost Perfect Scale-Revised* (*APS-R;* Slaney, Rice, Mobley, Trippi, & Ashby, 2001). The APS-R consists of 23 self-report items measured on a 7-point scale that fall into one of three subscales: High Standards (7 items), Order (4 items), and Discrepancy (12 items). The High Standards subscale measures one's performance

expectations. The Order subscale measures one's preferences for organization and order. The Discrepancy subscale measures the perception that one consistently fails to meet his/her goals and expectations (Rice & Ashby, 2007). The subscales measure adaptive (high standards, order) and maladaptive (discrepancy) perfectionism. Reliability and validity estimates are in the moderate to high range. For example, Slaney (2001) and his colleagues found the APS-R to have excellent convergent validity with other perfectionism scales and strong internal consistency between .85 and .92. Rice and his associates (2007) reported test-retest reliability scores of a 3-week interval ranging from .72 to .83 and an 8-10 week interval ranging from .76 to .87.

Chapter 3: Results

Group Formation

A total of 587 undergraduate students completed the survey through Sona Systems. Psychology professors at UCF often delete a percentage of the data from participants who complete their survey in the shortest times. This is done in order to eliminate students who hurriedly and randomly selected answers as quickly as possible solely to receive class credit. After the quickest 10% were deleted, 528 Sona System participants were left. Those who said they were currently enrolled in The Burnett Honors College (19 students) were placed in the High-Achieving group. This left 509 students in the Comparison group.

Since GPA was used as a measure of high achievement to classify students into the High-Achieving group, the researchers were concerned that the GPAs of freshmen (who had only been in college for one semester) were not a true representation of their future GPAs. The "law of regression toward the mean" states that if the first measurement of a variable is extreme, the second measurement and those thereafter will bring it closer to the true mean. According to this law, the research team decided to eliminate all freshmen from this study. A total of 215 students were eliminated because they were freshmen (213 students) or because they declined to state their year in college (2 students). Another 8 students were eliminated for putting invalid GPAs (ex: 0.32 or 0 or unknown). Of the remaining 286 students, 25 had a GPA of 3.8 or higher and were moved to the High-Achieving group. This left a total of 261 students in the Comparison group and only 44 students in the High-Achieving group.

As previously mentioned, in order to gather more High-Achieving participants, all students enrolled in The Burnett Honors College received an e-mail asking them to participate in a quick survey on the differences in mental health among different groups of undergraduate students. A total of 83 students responded to the e-mail and completed the survey through Qualtrics. Students with the 10% shortest times from this group (all High-Achieving) were not deleted because they completed the survey without the incentive of class credit and thus had no reason to do so if they did not want to participate. However, in order to stay consistent with "the law of regression to the mean" that was used with the Comparison group, students who said they were freshmen were deleted, bringing the High-Achieving group to a total of 118 students.

After further analysis, an inconsistency was found in the data from 22 participants (21 from the Comparison group and 1 from the High-Achieving group, all from the Sona Systems sample). Qualtrics survey software allowed the use of a skip function, so students who said they had not been diagnosed with a psychological disorder did not get to answer the next few questions which asked if they had been diagnosed with a certain class of disorder (example: an anxiety disorder, a mood disorder, a personality disorder, etc). Sona Systems software, however, did not allow the use of a skip function, so students who said they had not been diagnosed with a psychological disorder could later answer yes to the categorical questions (stating that they did indeed have an anxiety disorder, a mood disorder, a personality disorder, etc). Because students who had taken the survey on Qualtrics did not have the chance to later

say they had been diagnosed with a certain class of psychological disorder, the data from these 22 students were deleted. This led to a total sample of 357 students, with 240 students in the Comparison group and 117 students in the High-Achieving group.

The majority of the 22 inconsistencies described above were participants who answered they did not have a disorder and then later answered they did have an eating disorder or Attention Deficit Disorder. The research team hypothesized that students were unaware that these disorders were classified as psychological disorders in the study. Thus, the team expected that the overall rates of eating disorders and Attention Deficit Disorder reported in the total study sample were probably less than what is truly representative of the university population.

Analysis Plan

Relative risk and chi-squared tests were executed to determine if there was a significant relationship between group classification and psychological disorders, self-injury, and social anxiety. T-tests were used to compare group means on social anxiety subscales and totals, perfectionism subscales and totals, GPA, age, etc. In addition, linear regressions were performed to determine which variables were predictors of group classification, social anxiety, and perfectionism. The stated alpha value was 0.05. Any p-value less than 0.05 was accepted as statistically significant.

Sample and Group Characteristics

Gender, Race, Age, and Group Classification

The gender, race, and age breakdowns in the High-Achieving and Comparison groups were not significantly different from each other ($X^2(1, N = 355) = 1.616$, $p = .204$; $X^2(7, N = 357) = 11.882$, $p = .105$; $X^2(7, N = 357) = 9.907$, $p = .194$, respectively). For that reason, average percentages of gender, race, and age of the overall sample were reported. Among the total sample, 72% were female and 28% male. The racial breakdown was 62.7% Caucasian, 16.5% Hispanic, 9.0% African American, 5.0% Asian, 3.4% Biracial or Multiracial, and 3.4% Other. At the time of this study, the overall gender breakdown of undergraduates at UCF was 55% female and 45% male, so females were over-represented in this sample. The racial breakdown of this sample, however, closely mirrored UCF's racial breakdown. The majority of students (78.3%) fell into the "19-22 years" age range, the average age being 20.68 years ($SD = 1.717$).

GPA and Group Classification

An independent samples *t*-test was executed to see if the groups (High-Achieving and Comparison) differed in GPA scores. The High-Achieving group ($M = 3.73$, $SD = 0.236$) had a significantly higher average GPA than the Comparison group ($M = 3.12$, $SD = 0.404$), $t(355) = -15.132$, $p < .001$. Since GPA was used to classify students into the High-Achieving group (moving 25 students with a GPA ≥ 3.8 from the Comparison group to the High-Achieving group), the researchers also examined differences in GPA based on whether or not a student was currently enrolled in The Burnett Honors College (moving those 25 students back to the

Comparison group). This change in classification revealed a significantly higher High-Achieving2 group mean GPA of 3.69 (*SD* = 0.244) compared with a Comparison2 group mean GPA of 3.19 (*SD* = 0.446), $t(355) = -10.231$, $p < .001$.

Psychology Major/Minor and Group Classification

A little less than 36% of the High-Achieving group and a little more than 45% of the Comparison group said they were majoring in Psychology. Psychology minors were much less common. A little more than 3% of the High-Achieving group and a little less than 6% of the Comparison group said they were getting a minor in Psychology. A total of 39.3% of the High-Achieving group and 51.2% of the Comparison group were majoring or minoring in Psychology. A chi-squared test of independence was used to tell if there was a relationship between Group Classification and students majoring or minoring in Psychology. The results show that there was a relationship, $X^2(1, N = 357) = 4.493$, $p = .034$.

Giftedness and Group Classification

Participants were also asked if they had ever been placed in a gifted class. The possible answers were “yes”, “no”, and “my school(s) did not offer gifted programs”. Approximately two-thirds (66.7%) of the High-Achieving group and half (49.2%) of the Comparison group answered “yes”, that they had been placed in a gifted class. About 27% of the High-Achieving group and 42% of the Comparison group said they had never been placed in a gifted class. The remaining students (6.0% of the High-Achieving group and 9.2% of the Comparison group) said

their school had not offered a gifted program. The difference in percentages was significant, $X^2(2, N = 357) = 9.729$, $p = .008$. Approximately 61% each of males and females said they had been placed in at least one gifted class while growing up, so there was no difference between genders.

Psychological Disorders

Disorders and Group Classification (H_1 and H_{A1})

A total of 26 out of 117 High-Achieving students (22.2%) and 32 out of 240 Comparison students (13.3%) reported having been diagnosed with a psychological disorder. This difference in percentages between the two groups was significant, $X^2(1, N = 357) = 4.567$, $r(355) = .113$, $p = .033$. A relative risk assessment showed that High-Achieving students had a 67% increased risk of developing a psychological disorder (see Table 3).

Among the High-Achieving group, 73% of those diagnosed with at least one disorder had an anxiety disorder. Among the Comparison group, 68.8% of those diagnosed with at least one disorder had an anxiety disorder. Nineteen High-Achieving students (16.2%) indicated they had an anxiety disorder and 7 of the 19 students indicated they had more than one anxiety disorder. The anxiety disorder breakdown was as follows: 14 with Generalized Anxiety Disorder, 5 with Obsessive Compulsive Disorder, 2 with Post Traumatic Stress Disorder, 1 with Panic Disorder, 4 with Social Phobia (Social Anxiety Disorder), and 2 with Specific Phobia. Twenty-two Comparison students (9.2%) indicated that they had an anxiety disorder and 7 of the 22 students indicated that they had more than one anxiety disorder. The anxiety disorder

breakdown was as follows: 14 with Generalized Anxiety Disorder, 4 with Obsessive Compulsive Disorder, 5 with Post Traumatic Stress Disorder, 4 with Panic Disorder, 3 with Social Phobia (Social Anxiety Disorder), and 1 with Specific Phobia. The difference in percentages of the number of students diagnosed with an anxiety disorder (16.2% of the High-Achieving group and 9.2% of the Comparison group) was significant, $X^2(1, N = 357) = 3.870$, $p = .049$. High-Achieving students had a 76% increased risk of developing an Anxiety Disorder (see Table 3).

Eleven High-Achieving students (9.4%) said they had been diagnosed with a mood disorder and 2 of those 11 students had been diagnosed with more than one mood disorder. The mood disorder breakdown was as follows: 2 with Bipolar I Disorder, 3 with Bipolar II Disorder, 2 with Dysthymic Disorder, and 6 with Major Depressive Disorder. Eighteen Comparison students (7.5%) said they had been diagnosed with a mood disorder and 2 of those 18 students had been diagnosed with more than one mood disorder. The mood disorder breakdown was as follows: 3 with Bipolar I Disorder, 1 with Bipolar II Disorder, 1 with Dysthymic Disorder, and 15 with Major Depressive Disorder. The difference in percentages of the number of students diagnosed with a mood disorder (9.4% of the High-Achieving group and 7.5% of the Comparison group) was not significant, $X^2(1, N = 357) = 0.381$, $p = .537$.

Table 3: Percentages and Relative Risk of Psychological Disorders

	High-Achieving	Comparison	Relative Risk
All Psychological Disorders*	22.2%	13.3%	Honors had 67% increased risk.
Anxiety Disorders*	16.2%	9.2%	Honors had 76% increased risk.
Mood Disorders	9.4%	7.5%	Difference in percentages was not significant.

Note: * = Difference in Percentages $p < .05$

Three High-Achieving students (2.6%) said they had been diagnosed with an eating disorder, and one of these had more than one eating disorder. The eating disorder breakdown was as follows: 2 with Anorexia Nervosa, 1 with Bulimia Nervosa, and 1 with another eating disorder (not specified). Two Comparison students (0.8%) said they had been diagnosed with an eating disorder. The eating disorder breakdown was as follows: 1 with Anorexia Nervosa and 1 with Bulimia Nervosa. The difference in percentages of the number of students diagnosed with an eating disorder (2.6% of the High-Achieving group and 0.8% of the Comparison group) was not significant, $X^2(1, N = 357) = 1.706$, $p = .191$.

One High-Achieving student (0.9%) had been diagnosed with a personality disorder, Borderline Personality Disorder. Two Comparison students (0.8%) had been diagnosed with a personality disorder, and one had more than one personality disorder. The breakdown of the personality disorders was as follows: 1 with Borderline Personality Disorder, 1 with Antisocial Personality Disorder, and 1 with Narcissistic Personality Disorder. The difference in percentages of the number of students diagnosed with a personality disorder (0.9% of the High-

Achieving group and 0.8% of the Comparison group) was not significant, $X^2(1, N = 357) = 0.000$, $p = .983$.

Five High-Achieving students (4.3%) had a disorder classified as being in the "other" category, and two of those students had more than one disorder fitting in this category. The "other" disorder breakdown was as follows: 3 had Attention Deficit Disorder, 3 had Substance Abuse Disorder, and 1 had another psychological disorder (not specified). Seven Comparison students (2.9%) had a disorder classified as being in the "other" category. The "other" disorder breakdown was as follows: 4 had Attention Deficit Disorder, 1 had Substance Abuse Disorder, 1 had Schizophrenia, and 1 had another psychological disorder (not specified). The difference in percentages of the number of students diagnosed with an "other" disorder (4.3% of the High-Achieving group and 2.9% of the Comparison group) was not significant, $X^2(1, N = 357) = 0.446$, $p = .504$.

Students were asked if they thought they might have a psychological disorder. Possible answers included: yes (12.8% of High-Achieving students and 12.5% of Comparison students), no (44.4% of High-Achieving students and 43.3% of Comparison students), I'm not sure (17.1% of High-Achieving students and 17.9% of Comparison students), or not applicable because I have been tested and/or diagnosed (25.6% of High-Achieving students and 26.2% of Comparison students). The difference in percentages between groups was not significant, $X^2(3, N = 357) = 0.070$, $p = .995$.

Giftedness, Gender, and Psychological Disorders

A chi-squared test was used to determine whether there was a relationship between giftedness and diagnosis. The data for those who said their school(s) had not offered gifted programs was removed. Results showed that there was no relationship between giftedness and diagnosis, $X^2(1, N = 310) = 0.027$, $p = .870$. A chi-squared test was also run to see if there was a relationship between gender and diagnosis of a psychological disorder. Two participants declined to share their gender, so their data was removed from this test. A little over 19% of females and 9% of males stated they had been diagnosed with a disorder. This 10% difference was significant, $X^2(1, N = 355) = 5.069$, $p = .024$, so the research team concluded that there was a relationship between gender and diagnosis of a psychological disorder.

Self-Injury, Psychological Disorders, and Group Classification

Participants were also asked if they had ever hurt themselves on purpose (cutting, burning, etc.). The purpose of this question was to measure rates of self-injury. A total of 29.1% of the High-Achieving group and 18.8% of the Comparison group admitted to at least one incidence of self-injury. A chi-squared test of independence was run and it was determined that this 10.3% difference was significant, $X^2(1, N = 357) = 4.852$, $r(355) = .121$, $p = .028$. High-Achieving students had a 58% increased risk of self-injury. As expected, self-injury was correlated (although only weakly) with the diagnosis of a psychological disorder, $r(355) = .281$, $p < .001$. Specifically, it was correlated with the diagnosis of a mood disorder, $r(355) = .264$, $p < .001$, and the diagnosis of an anxiety disorder, $r(355) = .213$, $p < .001$.

SPAI-23 Scores (H_{A2}) and Group Classification

Independent t-tests were run on the SPAI-23 Social Phobia (SP) Subscale, the SPAI-23 Agoraphobia (AG) Subscale, and the SPAI-23 Difference Score (DS). The High-Achieving group mean (*M* = 41.85, *SD* = 13.154) for the SPAI-23 SP was significantly higher than the Comparison group mean (*M* = 38.66, *SD* = 13.199), *t*(355) = -2.15, *p* = .032. The High-Achieving mean (*M* = 28.23, *SD* = 7.035) for the SPAI-23 AG was slightly lower than the Comparison mean *(M* = 29.25, *SD* = 7.687), but this difference was not significant, *t*(355) = 1.208, *p* = .228. The High-Achieving mean *(M* = 23.44, *SD* = 14.666) for the SPAI-23 DS was considerably higher than the Comparison mean *(M* = 9.41, *SD* = 12.545), and this finding was significant, *t*(355) = -9.371, *p* < .001 (see Table 4). The SPAI-23 DS was modestly correlated with Group Classification (High-Achieving), *r*(355) = .445, *p* < .001.

Table 4: SPAI-23 *t*-test Results

		N	Mean	*SD*	*T*	
SPAI-23 SP	High-Achieving	117	41.85	13.154	-2.150	*
	Comparison	240	38.66	13.199		
SPAI-23 AG	High-Achieving	117	28.23	7.035	1.208	
	Comparison	240	29.25	7.687		
SPAI-23 DS	High-Achieving	117	23.44	14.666	-9.371	***
	Comparison	240	9.41	12.545		

Note: * = *p* < .05, *** = *p* < .001.

Independent *t*-tests were also run on individual questions from the SPAI-23. On statements like "I feel anxious when entering social situations where there is a small group" or "I feel anxious when entering social situations where there is a large group," the High-Achieving

mean scores *(M* = 2.50, *SD* = 0.970 and *M* = 2.93, *SD* = 1.165) were significantly higher than the Comparison mean scores (*M* = 2.10, *SD* = 0.935 and *M* = 2.52, *SD* = 1.131), *t*(355) = -3.747, *p* < .001 and *t*(355) = -3.221, *p* = .001.

In response to the statement "I feel anxious and I do not know what to do when in a new situation with other people," the High-Achieving group (*M* = 2.91, *SD* = 1.126) had a higher mean than the Comparison group (*M* = 2.53, *SD* = 1.086) and this finding was significant, *t*(355) = -3.076, *p* = .002. Also, in response to a statement about feeling anxious when approaching or initiating a conversation with others, the High-Achieving group (*M* = 2.80, *SD* = 1.011) had a significantly higher mean than the Comparison group (*M* = 2.45, *SD* = 1.074), *t*(355) = -2.940, *p* = .003. On a statement about making a speech in front of an audience, however, both groups had relatively high mean scores (High-Achieving: *M* = 3.44, *SD* = 1.234 and Comparison: *M* = 3.51, *SD* = 1.217), but the differences in mean scores were not significant, *t*(355) = .525, *p* = .600.

Social Anxiety Disorder Cut-off Scores

The amount of students who said they had been diagnosed with Social Anxiety Disorder in each group (4 in the High-Achieving group and 3 in the Comparison group) was not significantly different, X^2(1, N = 357) = 1.925, *p* = .165.

The research team ran an analysis to see how many students from each group met the suggested SPAI-23 cut-off score (a DS of 28 or higher) for having Social Anxiety Disorder. A total of 48 out of 117 High-Achieving students (41% of the group) met the cut-off score for having

Social Anxiety Disorder (see Table 5). Only four of those 48 said they had been diagnosed, so that left 44 out of 117 students (38% of the total High-Achieving sample) undiagnosed. A total of 20 out of 240 Comparison students (8.3% of the group) met the cut-off score for having Social Anxiety Disorder. Three Comparison students said they had been diagnosed with Social Anxiety Disorder, but one of these did not meet the cut-off score. That left 18 out of 240 Comparison students (7.5% of the total Comparison sample) as undiagnosed. Approximately 91% of students who met the cut-off score of 28 did not report being diagnosed with Social Anxiety Disorder. The difference in percentages of students who met the cut-off score of 28 for Social Anxiety Disorder (41% of the High-Achieving sample and 8.3% of the Comparison sample) was significant, $X^2(1, N = 357) = 54.519$, $p < .001$. Group classification and meeting the cut-off of 28 for having Social Anxiety Disorder were moderately correlated, $r(355) = .391$, $p < .001$.

An analysis was also run to see how many students from each group met a secondary suggested SPAI-23 cut-off score (a DS of 35 or higher) for having Social Anxiety Disorder. A total of 28 out of 117 High-Achieving students (or 24% of the group) and a total of 6 out of 240 Comparison students (or 2.5% of the group) met this cut-off score for having Social Anxiety Disorder (see Table 5). The difference in percentages meeting the cut-off score of 35 for Social Anxiety Disorder was significant, $X^2(1, N = 357) = 41.927$, $p < .001$.

Table 5: Descriptive Statistics and Relative Risks of SPAI-23 DS

	Min Score	Max Score	Percentage of Scores ≥ 28	Percentage of Scores ≥ 35
High-Achieving	-13	66	41.0%	24.0%
Comparison	-24	42	8.3%	2.5%
Relative Risk			High-Achieving have a 394% increased risk of having a score ≥ 28.	High-Achieving have an 860% increased risk of having a score ≥ 35.

Social Anxiety Disorder and GPA

Two independent sample *t*-tests were performed to see if GPA was significantly different between those who met the cut-off score for Social Anxiety Disorder (both High-Achieving and Comparison students included together) and those who did not. For the cut-off score of 28, those who had a score greater than or equal to 28 had a significantly higher GPA (M = 3.55, SD = 0.390) than those who had a score less than 28 (M = 3.27, SD = 0.457), $t(355) = 4.687$, $p < .001$. For the cut-off score of 35, those who had a score greater than or equal to 35 had a significantly higher GPA (M = 3.62, SD = 0.331) than those who did not make the cut-off score (with a SPAI-23 DS < 35) (M = 3.29, SD = 0.459), $t(355) = 4.028$, $p < .001$. There was a weak correlation between SPAI-23 DS Scores and GPA, $r(355) = .282$, $p < .001$.

Social Anxiety Disorder and Gender

A chi-squared test was run to see if there was a relationship between gender and meeting the criteria for Social Anxiety Disorder (SPAI-23 DS ≥ 28). A little more than 20% of females and 13% of males met the cut-off score for having Social Anxiety Disorder. This 7%

difference was not significant, and the researchers concluded that there was no relationship between gender and meeting the criteria for Social Anxiety Disorder, $X^2(1, N = 355) = 2.537$, $p = .111$.

APS-R Scores and Group Classification

Independent t-tests were run on the APS-R Total Scores (TS), the APS-R Standards Subscale Scores (SS), the APS-R Order Subscale Scores (OS), and the APS-R Discrepancy Subscale Scores (DS). The High-Achieving group mean ($M = 105.81$, $SD = 16.631$) for the APS-R TS was lower than the Comparison group mean ($M = 107.39$, $SD = 18.360$), but the finding was not significant, $t(355) = 0.784$, $p = .433$. The High-Achieving mean ($M = 43.88$, $SD = 4.410$) for the APS-R SS was significantly higher than the Comparison mean *(*$M = 41.53$, $SD = 5.968$), $t(355) = -3.793$, $p < 0.001$. The High-Achieving mean *(*$M = 20.94$, $SD = 4.685$) for the APS-R OS was slightly lower than the Comparison mean *(*$M = 21.37$, $SD = 4.730$), but this finding was not significant, $t(355) = 0.810$, $p = 0.418$. The High-Achieving mean *(*$M = 40.99$, $SD = 15.472$) for the APS-R DS was slightly lower than the Comparison mean *(*$M = 44.49$, $SD = 16.111$), but this finding was slightly insignificant, $t(355) = 1.952$, $p = 0.052$ (see Table 6).

Table 6: APS-R *t*-test Results

		N	Mean	*SD*	*t*	
APS-R TS	High-Achieving	117	105.81	16.631	0.784	
	Comparison	240	107.39	18.360		
APS-R SS	High-Achieving	117	43.88	4.410	-3.793	***
	Comparison	240	41.53	5.968		
APS-R OS	High-Achieving	117	20.94	4.685	0.810	
	Comparison	240	21.37	4.730		
APS-R DS	High-Achieving	117	40.99	15.472	1.952	
	Comparison	240	44.49	16.111		

Note: *** = $p < .001$.

Independent *t*-tests were also run on individual questions from the APS-R SS. On statements like "I have high expectations for myself" or "I have a strong need to strive for excellence," the High-Achieving mean score *(M* = 6.46, *SD* = 0.714 and *M* = 6.28, *SD* = 0.889) was significantly higher than the Comparison mean score (*M* = 6.09, *SD* = 1.021 and *M* = 5.75, *SD* = 1.236), $t(355) = -3.560$, $p < 0.001$ and $t(355) = -4.160$, $p < 0.001$.

An independent *t*-test was run on a question from the APS-R OS, "I think things should be put away in their places." Results showed that the High-Achieving mean score (*M* = 5.13, *SD* = 1.297) was lower than the Comparison mean score (*M* = 5.46, *SD* = 1.257) and this difference was significant, $t(355) = 2.334$, $p = 0.020$.

An independent *t*-test was also run on a question from the APS-R DS, "My performance rarely measures up to my standards." Results showed that the High-Achieving mean score (*M* = 3.04, *SD* = 1.668) was lower than the Comparison mean score (*M* = 3.54, *SD* = 1.684) and this difference was significant, $t(355) = 2.636$, $p = 0.009$.

Correlation Between SPAI-23 AG Subscale and APS-R Subscales

While running statistical tests, the research team discovered that two seemingly unrelated subscales (the SPAI-23 Agoraphobia Subscale and the APS-R Discrepancy Subscale) were very highly correlated. The SPAI-23 AG was very strongly correlated with the APS-R TS and the APS-R DS, $r(355) = .894$, $p < .001$ and $r(355) = .910$, $p < .001$. However, the SPAI-23 AG was only weakly correlated with the APS-R SS score, $r(355) = .192$, $p < .001$. These findings could have interesting implications for further research in trying to understand the relationship between Agoraphobia and the discrepancy aspect of perfectionism.

Regressions

Several exploratory linear regression analyses were employed to see if certain variables were significant predictors of Psychological Disorders, Group Classification, SPAI-23 DS, and APS-R TS.

Perfectionism as a Predictor of Psychological Disorders (H_{A3})

A linear regression test was employed to see if perfectionism was a predictor of being diagnosed with a Psychological Disorder (see Tables 7 & 8). Taken individually, the APS-R TS and the APS-R DS explained 0.9% and 1.2% (respectively) of the variance in the Psychological Disorders variable (a dichotomous "yes they have been diagnosed or no they have not been diagnosed" variable). Both were significant predictors ($p = .043$, $p = .024$).

Table 7: APS-R Total Score as a Predictor of Psychological Disorders

	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	Std. Error	Beta		
(Constant)	-.076	.119		-.638	.524
APS-R TS	.002	.001	.107	2.036	.043

Note: R^2 = .012 and Adjusted R^2 = .009

Table 8: APS-R Discrepancy Subscale as a Predictor of Psychological Disorders

	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	Std. Error	Beta		
(Constant)	.043	.056		.757	.450
APS-R DS	.003	.001	.120	2.269	.024

Note: R^2 = .014 and Adjusted R^2 = .012

Other Predictors of Psychological Disorders

Overall, 14.3% of the variance in Psychological Disorder answers (yes or no) was explained by seven variables: Group Classification, Self-Injury, Age, SPAI-23 DS, SPAI-23 SP, APS-R DS, and SPAI-23 Question #1 (see Table 9).

Table 9: Predictors of Psychological Disorders

	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	Std. Error	Beta		
(Constant)	-.648	.237		-2.731	.007
SPAI-23 DS	-.009	.003	-.367	-3.062	.002
Group Classification	.140	.050	.178	2.824	.005
Self-Injury	.171	.047	.191	3.650	.000
APS-R DS	-.002	.002	-.105	-1.534	.126
SPAI-23 SP	.013	.003	.450	3.589	.000
SPAI-23 Question 1	.035	.031	.090	1.102	.271
Age	.019	.011	.087	1.756	.080

Note: R^2 = .159 and Adjusted R^2 = .143

Predictors of Group Classification

A linear regression test was used to see which variables could significantly predict a participant's Group Classification (High-Achieving or Comparison). The results of the regression indicated that six predictors, the APS-R Order Subscale, the APS-R Standards Subscale, the SPAI-23 DS, the SPAI-23 AG, the SPAI-23 SP, and GPA explained 59.6% of the variance (see Table 10).

Table 10: Predictors of Group Classification

	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	Std. Error	Beta		
(Constant)	-1.306	.175		-7.471	.000
APS-R OS	-.009	.004	-.093	-2.537	.012
APS-R SS	.008	.003	.091	2.319	.021
SPAI-23 DS	.031	.002	.962	12.950	.000
SPAI-23 AG	.024	.003	.381	7.905	.000
SPAI-23 SP	-.026	.003	-.728	-9.964	.000
GPA	.426	.039	.415	10.804	.000

Note: R^2 = .603 and Adjusted R^2 = .596

Since GPA was used to classify students into the High-Achieving and Comparison groups, the research team expected it to have large predictive power in the Group Classification variable. Without GPA as a predictor variable, 46.3% of the variance in Group Classification (the Adjusted R^2 value of .463) was explained by the other 5 variables listed in the above regression.

Predictors of SPAI-23 Difference Scores

A linear regression test was also used to see which variables predicted the SPAI-23 DS. Results of the regression showed that 30.0% of the variance in the SPAI-23 DS variable could be explained by six other variables: Group Classification, APS-R TS, APS-R SS, Age, Diagnosis of Anxiety Disorder, and Self-Injury (see Table 11).

Table 11: Predictors of SPAI-23 Difference Score

	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	Std. Error	Beta		
(Constant)	26.682	9.014		2.960	.003
Group Classification	13.725	1.463	.436	9.384	.000
APS-R TS	-.151	.041	-.182	-3.709	.000
APS-R SS	-.389	.133	-.148	-2.932	.004
Age	.652	.391	.076	1.668	.096
Anxiety Diagnosis	7.638	2.119	.165	3.604	.000
Self-Injury	5.138	1.651	.144	3.112	.002

Note: R^2 = .312 and Adjusted R^2 = .300

Predictors of APS-R Total Scores

Another linear regression test was run to see which variables predicted the APS-R TS. The test revealed that three variables explained 80.0% of the variance in the APS-R TS: SPAI-23 AG, SPAI-23 SP, and Diagnosis of Anxiety Disorder (see Table 12).

Table 12: Predictors of APS-R Total Score

	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	Std. Error	Beta		
(Constant)	46.934	1.918		24.468	.000
SPAI-23 AG	2.147	.058	.902	36.711	.000
SPAI-23 SP	-.059	.035	-.044	-1.691	.092
Anxiety Diagnosis	1.674	1.395	.030	1.200	.231

Note: R^2 = .801 and Adjusted R^2 = .800

Chapter 4: Discussion

Numerous studies have focused on the mental health of undergraduate students in general, but the research team could not find any research regarding the differences in mental health between high-achieving and typical undergraduate students. The aim of this study was to determine whether high-achieving students experience a better or worse psychological well-being than their peers. Primarily the research team addressed four questions: 1) Is there a statistically significant association between the UCF High-Achieving student population and reported psychological disorders? 2) Do UCF High-Achieving students have significantly higher rates of reported psychological disorders than Comparison (typical) students? 3) Do UCF High-Achieving students have significantly higher rates of social anxiety than Comparison students? 4) Is perfectionism a statistically significant predictor of psychological disorders?

With respect to the first question, the research team found that there was a weak, positive correlation between the UCF High-Achieving student population and the incidence of psychological disorders. This correlation was not a strong one, but it was statistically significant. Therefore, the null hypothesis, that no relationship exists, was rejected.

Was this association due to the increased cognitive capacities of the gifted High-Achieving students? Because the research team found that there was no relationship between self-reported inclusion in childhood gifted classes and the diagnosis of a psychological disorder, the researchers hypothesized that the difference in rates of psychological disorders between the High-Achieving group and the Comparison group was not due to giftedness. Because only

14.3% of the variance in incidence of psychological disorders was explained by seven variables (Group Classification included), future studies should examine other variables that may account for more of this variance. Perhaps family history, life satisfaction, high achievement, and stress levels should be examined as possible predictors.

With respect to the second question, about 22% of the UCF High-Achieving students and only 13% of the Comparison students reported having been diagnosed with a psychological disorder. High-Achieving students had a 67% increased risk of having a psychological disorder. The researchers found the rates of diagnosed anxiety disorders to be particularly interesting. The High-Achieving group reported almost twice as many (per capita) anxiety disorders as the Comparison group. High-Achieving students had a 76% increased risk of having an anxiety disorder.

With respect to the third question, the research team found that High-Achieving students consistently scored higher than Comparison students on the *Social Phobia and Anxiety Inventory – 23*. Specifically, they scored higher on the Social Phobia Subscale and they had higher Difference Scores. There was no difference between groups on the Agoraphobia Subscale. This led the team to believe that the variation in Difference Scores between the two groups was due to higher levels of social anxiety in High-Achieving students.

The amount of students who said they had been diagnosed with Social Anxiety Disorder was virtually the same in both groups (4 students in the High-Achieving group and 3 students in the Comparison group). However, the difference in percentages meeting the SPAI-23

Difference Score cut-off indicative of Social Anxiety Disorder was surprising. Over 40% of the High-Achieving students and less than 10% of the Comparison students met the cut-off score of 28. This difference was significant. The research team decided to examine the difference at the cut-off score of 35 as well. Over 24% of the High-Achieving students and less than 3% of the Comparison students met this higher cut-off score. This finding was also significant. Regardless of the cut-off score used, High-Achieving students had a greatly increased risk of having Social Anxiety Disorder (394% at the cut-off of 28 and 860% at the cut-off of 35).

It is important to note that 9 out of 10 students who met the cut-off score of 28 did not report having been diagnosed with Social Anxiety Disorder. This sheds light on the need for greater awareness of psychological disorders (especially Social Anxiety Disorder) among all undergraduate students. Furthermore, this coupled with the high levels of High-Achieving students meeting the cut-off score (both 28 and 35) for Social Anxiety Disorder implies a need for routine evaluations of high-achieving undergraduate students.

High-Achieving students reported feeling more anxiety than Comparison students in most social situations. High-Achieving students reported more anxiety than Comparison students when entering both large and small social settings. High-Achieving students were also more anxious about initiating conversation and being in a new situation with other people. However, both the High-Achieving and the Comparison groups reported experiencing significant amounts of anxiety when making a speech in front of an audience. Also, most

students (both High-Achieving and Comparison) reported more anxious feelings in large group settings than in small group settings.

With respect to the fourth question, the researchers found that two measures of perfectionism (APS-R Total Score and APS-R Discrepancy Score) were statistically significant predictors of the diagnosis of a psychological disorder (dichotomous "yes" or "no" answers). Although statistically significant, they predicted very little of the variance in the Psychological Disorder variable. Although this hypothesis was supported, there was very little practical significance to the finding.

The only difference in perfectionism scores between the two groups was on the APS-R Standards Subscale Score. The High-Achieving group scored significantly higher on this subscale, indicating that high-achieving undergraduate students generally expect more of themselves than typical undergraduate students do.

Interestingly, the SPAI-23 Agoraphobia Subscale scores were very strongly correlated with the APS-R Discrepancy Subscale scores and the APS-R Total Scores. However, the SPAI-23 Agoraphobia Subscale was only weakly correlated with the APS-R Standards Subscale. This connection needs to be studied further, but it seems to suggest that those with high levels of Agoraphobia perceive that they consistently fail to meet the standards (although maybe not high standards) that they set for themselves. Perhaps there is a correlation between the incidence of Agoraphobia and maladaptive perfectionism.

The difference in reported self-injury between groups was significant. Approximately 29% of the High-Achieving group and 19% of the Comparison group admitted to at least one incidence of self-injury. This contradicts the theory reported by Neihart (1999) that increased cognitive capacity leads to healthier stress-coping mechanisms. As expected, self-injury was correlated (although only weakly) with diagnosis of a psychological disorder, specifically mood disorders and anxiety disorders.

In line with Peterson's (2000) findings that high-achieving students often maintain high grades even when highly distressed, this study's sample of High-Achieving students maintained an average GPA of 3.73 compared to the Comparison average of 3.12. It could be argued that the High-Achieving sample was bound to have a higher average GPA, because 25 Comparison students with higher GPAs were moved to the High-Achieving group. However, the average GPA of those currently enrolled in The Burnett Honors College (3.69) was also significantly higher than those not currently enrolled in The Burnett Honors College (3.19). This, coupled with the fact that High-Achieving students experienced higher rates of self-injury, psychological disorders, and social anxiety, led the researchers to believe that high-achieving students are able to maintain a high GPA even under distress.

Although the results from this study may have yielded some new and unique information and insights, the results should be interpreted in the context of several limitations. First and foremost, the nature of the cross-sectional design of this study presents limitations

concerning causality. Also, this study was the first of its kind and thus needs to be replicated several times before the null hypotheses can be truly rejected.

Secondly, data collection as a whole was a large limitation in this study. The sample was a non-probabilistic convenience sample, and data was collected from only one large university in the southeast. It is unknown if findings are generalizable to students at all sizes of universities in all geographic locations. Furthermore, data was collected during only one semester. Also, a relatively small number of UCF students participated and group sizes were unequal. Some of the results that were insignificant might be statistically significant when comparing two larger, equally-sized groups from UCF.

Another large limitation was based on the instrument of measurement. The results of this study were based entirely on self-report and some of the survey questions were retrospective in nature. This introduced and increased the likelihood of false data based on faulty recall. The survey included several original questions that had not been tested for psychometric properties, including questions about self-injury and specific types of psychological disorders. Some disorders were not included in the survey (such as most somatoform disorders and certain psychotic disorders). This same study might yield different results if questions about self-injury and psychological disorders were phrased differently. The survey also included several widely-used screening measurements. Although these professionally developed and tested scales have fairly strong psychometric properties, it is

unknown if a different approach, such as personal interviews or focus groups, would yield the same results.

Other limitations exist in the group classification process and statistical analyses. Although often used as a measure of high-achievement, many agree that GPA is a less than satisfactory measure of high-achievement. Additionally, the chosen cut-off GPA score for group classification was arbitrary. The selection of other classification criteria might produce different results. Furthermore, the researchers acknowledge that using binary logistical regressions may have been more appropriate than using linear regressions. However, the results of the linear regressions have essentially the same R^2 and significance values as the logistical regressions.

Also, use of Sona Systems presented some issues. In this study, 39.3% of the High-Achieving group and 51.2% of the Comparison group reported majoring or minoring in Psychology. There is a theory that those who major or minor in Psychology have more personal psychopathology and/or familial psychopathology than those who major or minor in other subjects. However, there is a huge lack of research (supportive or contrary) in this area. One study found that choice of major (specifically Psychology) was a significant predictor of trauma experienced in childhood and adulthood (Barlow & DeMarni Cromer, 2006). This study showed that when compared with other majors, Psychology majors had a statistically significant higher incidence of self-injury (p = .018) but no higher incidence of psychological disorder diagnoses (p = .111). If this theory is true, results may be even more pronounced when a High-Achieving group is compared with a Comparison group composed of non-Psychology majors. Future

research should examine the differences in mental health between three groups: a High-Achieving group, a Comparison group composed of psychology majors and minors, and a Comparison group composed of other majors.

Altogether, the findings of this study indicate that high-achieving undergraduate students experience a worse psychological well-being than typical undergraduate student peers. Additionally, high-achieving students may be better at hiding psychological distress than their peers, so it is important to find ways to identify these students and/or encourage them to talk about their distress. Findings suggest that high-achieving students may benefit from some sort of screening and intervention/counseling program aimed at limiting the negative effects of psychological disorders among this specific group of students. Programs to raise knowledge and awareness of anxiety disorders (especially Social Anxiety Disorder) should be stressed. In order to combat the high incidence of self-injury among high-achieving students, this group should be taught several adaptive coping mechanisms and should be encouraged to talk about self-injury and other psychological problems with their peers and college staff members.

Since The Burnett Honors College students are separated during UCF Orientation, it would be fairly easy to give students a Social Anxiety Inventory in order to identify those students who may benefit from special career mentoring and social encouragement. The UCF Burnett Honors College already offers several ways (mainly in the form of special events, luncheons, and volunteer opportunities) to foster relationship bonding, team building, and community involvement. However, it is unlikely that students experiencing elevated symptoms

of social anxiety would be interested in attending these events. Maybe a special event could be created to reach those who may be afraid to attend most social events. Future studies should examine different ways to help treat high-achieving students with elevated social anxiety.

Appendix A: IRB Approval Letter

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Michael J. Rovito** and Co-PIs: **Amy L. Elliott, Jeffrey S. Bedwell**

Date: **September 18, 2012**

Dear Researcher:

On 9/18/2012, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review:	Exempt Determination
Project Title:	An Examination of Psychological Disorders, Social Anxiety, and Perfectionism in Honors Undergraduate Students
Investigator:	Michael J Rovito
IRB Number:	SBE-12-08646
Funding Agency:	
Grant Title:	
Research ID:	N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 09/18/2012 02:08:23 PM EDT

Joanne Muratori

IRB Coordinator

Appendix B: Original Survey Questions

1. What is your age?
    a. <18
    b. 18
    c. 19
    d. 20
    e. 21
    f. 22
    g. 23
    h. 24
    i. 25
    j. >25

2. What is your gender?
    a. Male
    b. Female
    c. I would rather not say.

3. What year are you in college?
    a. Freshman
    b. Sophomore
    c. Junior
    d. Senior
    e. Super Senior (4+ years)

4. What ethnic/racial group do you most identify with?
    a. African American
    b. American Indian
    c. Asian
    d. Middle Eastern
    e. Caucasian
    f. Hispanic
    g. Biracial or multiracial
    h. Other
    i. I would rather not say.

5. What is your overall UCF grade point average (GPA) (Ex: 3.5)? If you don't have a GPA yet, write N/A.

6. Were you ever placed in a "gifted class"?
    a. Yes
    b. No
    c. My school(s) did not offer gifted programs.

7. Are you currently enrolled in The Burnett Honors College (HIM students included)?
    a. Yes
    b. No

8. Have you ever been diagnosed with a psychological disorder (ex: social anxiety, GAD, major depressive disorder, schizophrenia, etc)?
    a. Yes
    b. No

9. Have you ever been diagnosed with a Mood Disorder (choose all that apply)?
    a. Major Depressive Disorder
    b. Dysthymic Disorder
    c. Bipolar Disorder (I or II)
    d. No, I have never been diagnosed with a Mood Disorder.

10. Have you ever been diagnosed with an Anxiety Disorder (choose all that apply)?
    a. Panic Disorder
    b. Specific Phobia
    c. Social Phobia (Social Anxiety Disorder)
    d. Obsessive-Compulsive Disorder
    e. Post-Traumatic Stress Disorder
    f. Generalized Anxiety Disorder
    g. No, I have never been diagnosed with an Anxiety Disorder.

11. Have you ever been diagnosed with an Eating Disorder (choose all that apply)?
    a. Anorexia Nervosa
    b. Bulimia Nervosa
    c. Other Eating Disorder
    d. No, I have never been diagnosed with an Eating Disorder.

12. Have you ever been diagnosed with a Personality Disorder (choose all that apply)?
    a. Borderline Personality Disorder
    b. Antisocial Personality Disorder
    c. Narcissistic Personality Disorder
    d. Avoidant Personality Disorder
    e. Schizoid Personality Disorder
    f. Schizotypal Personality Disorder
    g. Other Personality Disorder
    h. No, I have never been diagnosed with a Personality Disorder.

13. Have you ever been diagnosed with a psychological disorder that was not listed in the above questions (choose all that apply)?
    a. Schizophrenia
    b. Body Dysmorphic Disorder
    c. Substance Abuse Disorder
    d. Attention Deficit Disorder
    e. Other Psychological Disorder
    f. No, I have not been diagnosed with a disorder other than what I have already selected in previous questions.

14. If you have never been tested or diagnosed, do you think you might have a psychological disorder?
    a. Yes, I think I might have a psychological disorder.
    b. No, I don't think I have a psychological disorder.
    c. I'm not sure if I have a psychological disorder or not.
    d. This question does not apply to me because I have been tested and/or diagnosed.

15. Have you ever hurt yourself on purpose (cutting, burning, etc)?
    a. Yes
    b. No
    c. I would rather not say.

16. Are you a psychology major or minor?
    a. I am a psychology major.
    b. I am a psychology minor.
    c. I am not a psychology major or minor, but I have taken a psychology course other than General Psychology.
    d. I am not a psychology major or minor, and I have never taken a psychology course other than General Psychology.
    e. I have never taken a psychology course.

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