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Gender differences in test anxiety

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Gender Differences in Test Anxiety

by

Angela M. Fiore

Thesis submitted to
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at West Virginia University
in partial fulfillment of the requirements
for the degree of

Master of Arts
in
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Approved by

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ABSTRACT

GENDER DIFFERENCE IN TEST ANXIETY

Angela M. Fiore

The research regarding overall general test anxiety and sex difference is contradictory at best. There is no clear answer to the research question concerning general test anxiety and sex difference according to the literature. An experiment using the modified Suinn Test Anxiety Behavior Scale (1971) was conducted to detect differences between the sexes with regard to test anxiety. There was no overall significant difference between the genders; however, when a multivariate regression was conducted to account for variability contributed by age and class, there was a statistically significant difference. This finding can be perceived as an indication that it is not gender alone that causes significant differences in general test anxiety. More research must be conducted to isolate the variables accounting for significant differences.

Dedication

I would like to dedicate this thesis to everyone who have supported me in my educational endeavors. People pass in and out of your life and I have been very fortunate to have many that have positively influenced me.

To my grandfather, Mr. John A. Danzilli, Jr., you have been the most positive influence in my life. You have always supported me with love, guidance, and compassion. I can never express my heartfelt gratitude for everything you have done to make my educational path a little easier. I do not think you realize just what an impact you have had on me. I know that you do not completely understand my dedication to education and the convoluted path I have traveled, but you have always encouraged me to go on and never give up my goals. This simple dedication could in no way come close to honoring and thanking you.

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CHAPTER ONE

INTRODUCTION

Problem Statement

The purpose of this thesis was to determine if a significant difference between the genders could be found with regard to general test anxiety. A secondary purpose was to determine if a significant difference could be found with regard to class rank and test anxiety.

Hypotheses

H₁: There is not a significant difference between the genders with regard to general test anxiety.

H₂: There is not a significant correlation between class rank and test anxiety.

H₃: There is not a significant difference in test anxiety levels between class ranks.

Rationale

The rationale for investigating test anxiety and gender difference is to explore the possibility of gender-biased testing due to increased test anxiety experienced. There was a dichotomy found within the literature with a large body of evidence supporting the theory of test anxiety and gender difference and an equally large body of literature refuting the theory that there is a significant difference between the genders with regard to general test anxiety. This study was conducted to support the theory that there is no difference between the genders for general test anxiety and efforts should be concentrated on other more specific aspects of gender difference and test anxiety.

Definitions

Test Anxiety- A bidimensional construct consisting of an affective component (emotionality), and a cognitive component (worry), with the two components being positively correlated (Liebert & Morris, 1967; Deffenbacher, 1980). A situation specific anxiety trait (Spielberger, 1972).

Emotionality- Behavioral or physiological reaction to testing situations. There are two distinct stages, beginning with the physiological reactions which occur as a result of conditioning

and then followed by an awareness of these physiological changes (Turner, 1985; Williams, 1994). “Autonomous nervous system reactions evoked by tests (Liebert & Morris, 1967).”

Worry- Refers to cognitive concerns about test performance related to past performance and perceived potential for failure (Turner, 1985; Williams, 1994). “Concern for anticipated consequences of test failure (Liebert & Morris, 1967).”

Academic Achievement- "... the striving to increase, or keep as high as possible, one's own capability in all activities in which a standard of excellence is thought to apply and where the execution of such activities can, therefore, either succeed or fail." (Heckhausen, 1967, pp. 4-5).

Stress- A stimulus event (Holmes & Rahe, 1967); a response elicited by some external event (stimulus) (Selye, 1976). Physical symptoms elicited by the autonomic nervous system manifesting from psychological bases (Gazella, Masten, & Stacks, 1998).

Statement of Purpose

The present study attempted to investigate if there is a gender difference in general test anxiety. There were three (3) hypotheses tested: (a) that there is not a significant difference in general test anxiety between the genders; (b) that there is no significant correlation between class rank (freshman, sophomore, junior, senior) and general test anxiety; (c) that there is no significant difference in test anxiety levels between the class ranks. A convenience sample of two hundred and ninety (290) subjects that attended West Virginia University were administered the Suinn Test of Anxiety Behavioral Scale (1971). All the subjects were undergraduate students. The version of the survey the subjects completed related solely to general test anxiety. The implications of this study could include research with regard to gender differences in specific subject or state test anxiety as opposed to overall general test anxiety. Also, this study could have implications on curriculum and instruction, as well as teaching style to accommodate possible gender differences resulting in gender biased testing. If there are significant gender differences found, it could impact educational practices to promote gender-friendly testing and testing methodology; however, since this study is only looking at general test anxiety, it could lead to

further research in the area of subject specific anxiety. There has already been some work done in this area (D'Ailly & Bergering, 1992; Dew & Galassi, 1983; Fan, Chen, & Matsumoto, 1997; Furst, Gershon, & Weingarten, 1985; Hyde, Fennema, & Lamon, 1990; Onwuegbuzie, 1995; Richardson & Suinn, 1972; Silvestri, 1986; Zoller & Ben-Chain, 1990). If it can be more conclusively shown that there is not a general anxiety difference, then research will be able to focus on a more micro level to determine the etiology of test anxiety. These findings may be indicated by not only examining the situations that may be anxiety provoking, but also at which psychological treatments alleviate the symptoms. The treatments may not only indicate the specific anxiety provoking situations, but may also give a clue if the entire construct is biologically based. There are many implications and further research that may result from the findings of this study.

CHAPTER TWO

REVIEW OF LITERATURE

As the world advanced technologically, the need for adequate educational preparation became paramount. Due to the competitive nature of society, a focus on educational success has permeated societal consciousness. With this drive to achieve, many psychological aspects became apparent. The more that is known about why one succeeds or fails in academic situations, the better one can change cognitively or behaviorally to achieve optimum individual success.

This study attempted to support the theory that men and women do not differ with regard to general test anxiety. The literature indicated a slight difference in the areas of mathematics and science. However, this study is focused solely on general test anxiety. The implications for this study are to open the doors for curriculum design and instructional styles to be better defined were there to be a gender difference discovered. If there truly is a significance between the genders with regard to test anxiety, then accommodations should be made to alleviate this discomfort. With an equal and stable baseline of test anxiety for both genders, an exam will test the student's actual knowledge on the subject without regard to test anxiety manifested simply by gender and the coping ability of the student.

The first hypothesis states that there is no significant difference between the genders with regard to generalized test anxiety. By starting with this general statement, further research may be conducted to pinpoint specific subject areas where there could possibly be a gender difference. An advantage of beginning at a macro level is that the question of gender difference and test anxiety can be better managed. As research continues concerning gender differences and

test anxiety, future investigators will be able to narrow the scope and formulate possible solutions for specific areas or subjects that show significant differences. The other hypotheses investigated are with regard to significant differences between class ranks and test anxiety and correlations between test anxiety and class rank. These findings could indicate that there is a manifestation of test anxiety not necessarily related to gender, but rather to class standing. The present study hypothesizes that there are not significant correlations of differences with regard to class rank and test anxiety.

Test anxiety was first identified as a psychological phenomenon in the early 1950s (Mandler, 1952; Sarason, 1953). Since that time the psychological phenomenon of test anxiety has been closely studied and has grown as an area of educational research. Statistically, it has been determined that as many as 10 million students in elementary and secondary school perform poorly on examinations due to test anxiety (Hill, 1980; 1984). This translates to approximately 20% of school children and 25% of college students having performance debilitating test anxiety, without regard to gender (Wilson & Rotter, 1986).

Test anxiety is defined as consisting of two components: worry and emotionality (Liebert & Morris, 1967). Nausea, elevated heart rate, and increased body temperature are associated with the emotionality component of test anxiety. The worry component consists of internal expectations of failure based upon past performance. This aspect of test anxiety can interfere with cognitive activity at the time of evaluation, such as memory recall, distractibility, and deficits in general concentration. Though worry and emotionality are separate components, they are positively correlated in relation to each other (Deffenbacher, 1980). Although most relaxation

strategies address the emotionality component, it has been indicated that the worry components of test anxiety are the aspects that most adversely affect academic achievement (Gross, 1990).

Research has established that people with high levels of test anxiety are associated with low academic achievement. These people perform poorly not only in the regular classroom setting but also on achievement and aptitude tests. Even though the researchers did not examine the construct of gender, anxiety may be seen as a potential threat to test validity, even without the construct of gender examined (Payne, Smith, & Payne, 1983). Students who suffer from test anxiety do not necessarily lack in intellect or drive. Test anxiety, and other deficits related to test anxiety, interfere with academic performance (Everson & Millsap, 1991).

Test anxiety may also affect test performance by interfering with in-class learning, development of adequate study skills, and homework achievement. These students do not recognize relevant information, are unable to integrate this knowledge into their long-term memory, and do not possess the skills to self-evaluate their learning state (Gross, 1990). Tobias' Cognitive Attentional Model (1980) describes this process in terms of deficits in all the stages necessary to retain and recall information.

There seems to be a correlation between increased test anxiety and lower performance, which can be associated at both the high school and university level (Gaudry & Spielberger, 1971). According to their research, there are breakdowns in the following areas of learning: the preprocessing stage (the initial introduction of information), the processing stage (the cognition of information), and the production stage (the reproduction of information). As researched, if there are deficits in any of the stages, then there will be a breakdown of skills and, thus, cause test anxiety. The student becomes highly anxious because of this lack of background knowledge and fails to perform as well due to breakdowns in concentration.

Individuals with low levels of anxiety maintain their focus throughout information processing and retrieval. Because there are few to no cognitive breakdowns, these individuals stay on task and perform well on exams and achievement tests (Wigfield & Eccles, 1989). These individuals process information as it is presented and develop adequate study habits. With this confidence in their knowledge, low-anxious individuals are less likely to have disruptive thoughts while completing the examination or studying for the exam initially. Their focus is not on the task or material to be learned, but on disruptive thoughts of failure.

In contrast, individuals with high levels of anxiety generally have poorer study skills, and these poor study skills result in poor test performance. These students are then conditioned to expect failure when in a testing situation. This conditioning is achieved when the results of the poorer study skills inevitably result in lower test scores. Low-anxious individuals have not been reinforced to be conditioned to expect failure. Unlike low-anxious individuals, high-anxious individuals have this conditioning. They believe that no matter how long they study, they are doomed to fail. This expectation of failure is akin to learned helplessness and attribution theory (Maier & Seligman, 1976; Seligman, 1975). These psychological theories state that the individual cognitively thinks that no matter what happens, a certain event is destined to occur. In this case, it is failure with regard to academic testing.

In addition to attribution theory and learned helplessness (Maier & Seligman, 1976; Seligman (1975), these thoughts of certain failure disrupt the encoding of material as well as the retrieval of information. This repeated cycle of poor test scores reinforces the student's expectations of failure when placed in a testing situation. The anxiety mounts, and the exam scores remain poor. They experience physiological changes as well as cognitive thoughts of failure while attempting to succeed on the examination. This learned helplessness, as well as

the interference with information retrieval due to additional psychological and physiological changes, results in academic failure. All these factors cycle back and create even more test anxiety (Gierl & Rogers, 1996; Gross, 1990; Williams, 1991; 1994; 1996; Wilson & Rotter, 1986). An interesting finding by Rouxel (2000) indicates that it is not only the level of preparation, but also the subject matter studied that may lead to different levels of test anxiety. This research indicates that people experienced higher levels of anxiety the more they prepared for verbally based exams, but they experienced decreased levels of anxiety the more they prepared for math-based exams. The level of anxiety had no significant effect on achievement in either area (Rouxel, 2000).

Mwamwenda (1994) supported previous research that found that students perform more poorly on academic tests when experiencing test anxiety with his study on South African University graduate students. This study found that test preparation had no effect on the level of test anxiety and that highly test-anxious students performed poorly regardless of the amount of exam preparation. Regardless of gender, the students who reported experiencing higher levels of test anxiety had lowered academic performance. Interestingly, the test on which the students reported the anxiety levels and measured performance was an educational psychology exam. The researcher stated that this type of exam was used due to convenience sampling, as well as the possibility of another potentially confounding variable of mathematical/scientific test anxiety. Generally, it is believed that females have a greater likelihood of experiencing test anxiety. Some theorize that this is because society has different expectations for the genders. Many children are reared according to societal norms and mores that determine which roles are appropriate for which gender (Silvestri, 1986). Due to this biased upbringing, children perceive activities to be either masculine or feminine in nature. Excelling in an area that is not gender-appropriate often

leads to punishment (Silvestri, 1986). This early conditioning encodes certain gender-specific behaviors and activities, as well as gender-specific expectations. Generally, males are expected to achieve in math, science, and technology, whereas females are reared to be interested in the arts and humanities (Silvestri, 1986). The expected success of females in a given scientific task is generally lower than that of their male counterparts, even if they are equally competent. This societal belief has led to the theory that females are more highly test anxious than male has been some research to support the assertion that females are more test anxious with regard to math studies and have lower levels of test anxiety with regard to verbal exams than their male counterparts (Benson & Bandalos, 1989; Dew & Galassi, 1983; Meece, Eccles, & Wigfield, 1990; Richardson & Suinn, 1972; Rouxel, 2000; Wolters, Yu, & Pintrich, 1996); however, in other research, these differences have been nonsignificant and slight (Fan, Chen, & Matsumoto, 1997; Hyde, Fennema, & Lamon, 1990; Pajares & Graham, 1999). It can be comfortably asserted that more research must be conducted to determine whether this is a result of gender-based differences in test anxiety or if the etiology is rooted in the different types of academic disciplines (Furst, Gershon, & Weingarten, 1985).

This societal belief has not been overwhelmingly supported in the research community with regard to the published literature. Many studies support the notion that males and females experience no significant differences in general test anxiety (D'Ailly & Bergering, 1992; Everson & Millsap, 1991; Mwamwenda, 1993; Payne, 1984; Rhone, 1986; Sowa & LaFleur, 1986; Zoller & Ben-Chaim, 1990). These studies used a variety of testing tools, such as the Test Anxiety Inventory (Spielberger, Gonzalez, Taylor, Anton, Algaze, Ross, & Westberry, 1980), the Test Anxiety Scale for Children (Sarason, Lighthall, Davidson, Waite, & Ruebush, 1960),

and the Test Anxiety Profile (Oetting & Deffenbacher, 1980). All these assessment tools utilized a Likert-type scale for self-evaluation.

However, several studies have found significant differences with regard to general as well as specific test anxiety. This ambiguity in the literature has led to further research to define if test anxiety is an overall general difference or if there is another variable such as subject matter that indicates significant gender differences. A prime example of this is the comparison of two studies conducted by Mwamwenda (1993; 1994). In the 1993 study, Mwamwenda found no difference in test anxiety or academic achievement (based on self-reported grade point average). There was nothing offered in the study with regard to actual grade point average. He conducted this study on undergraduate students at a South African University. A year later, another study conducted by this researcher found a significant gender difference as well as lowered academic performance (across genders for high test-anxious individuals).

Once again, the researcher used students from a South African University; however, these were graduate students, and academic achievement was based not on a self-report, but on actual scores on an educational psychology exam. This comparison not only of two studies, but studies so similar in culture, race, location, and even primary researcher, belies the ambiguity within the body of literature with regard to test anxiety in general.

There has been no research supporting the idea that level of study also influences possible gender differences in test anxiety, but it can be comfortably inferred that there should be such a significant difference between undergraduate and graduate students due to the very nature of the academic rigors involved in the course of study as well as the fact that graduate students have had more experience dealing with stress in examination situations. This question of significant

levels of test anxiety between undergraduate and graduate students needs to be further examined for conclusive evidence and theoretical support.

Zeidner and Safir (2001) also examined the question of gender differences in test anxiety. This study looked not only at simple gender differences but also at differences in anxiety levels across socioeconomic classes. The researchers sampled 416 students (191 males and 225 females) drawn from 10 secular comprehensive junior high schools in northern Israel using the Test Anxiety Scale for Children (TASC) (Sarason, Lighthall, Davidson, Waite, & Ruebush, 1960). These schools were chosen because they represent a socioculturally (ethnic and socioeconomic status) diverse population, with 56% Sephardic extraction (n=229), 32% European extraction (n=131), and 12% second-generation Israelis (n=52). Even with this ethnic diversity, 91% (n=377) were native Israelis. The reported numbers of subgroups of subjects does not equal the number of total subjects included in the sampling and no explanation is offered as to the reason for the discrepancy. Both occupational status and education of the primary income provider in the student's family determined socioeconomic status (SES). The classification resulted in about 44% of the sample originating from middle-class families (n=195) and 56% (n=217) from lower-class backgrounds. This diversity within economic class was included to indicate if it is gender or SES that contributes to higher levels of test anxiety. Although significant gender differences in mean levels of test anxiety were found, with females consistently scoring higher across SES, ethnic, and grade categories, the significance was negligible. Interestingly, no significant differences were found across all variables for students with an Eastern background. School achievement was not significantly correlated with test anxiety among males in any grade level; however, a significant inverse correlation was found between test anxiety and achievement among females in all three grade levels. Therefore, test

anxiety was negatively associated with academic achievement for females (Zeidner & Safir, 2001).

Although differences have been reported between males and females in relation to the different component aspects of test anxiety (worry and emotionality), there are few studies that find significant differences between the genders (Everson & Millsap, 1991; Hembree, 1988; Mwamwenda, 1994; Wigfield & Eccles, 1989). In the study by Everson and Millsap (1991), it was shown that females have higher levels of worry as well as higher levels of emotionality. The researchers used the Test Anxiety Inventory (TAI) with a convenience sample of American college students. The study used 501 undergraduate students (219 males and 282 females) from an unidentified large urban university. The TAI has factorial validity, and the study indicated that the dual structure had no gender difference.

With these aspects in mind, the results still indicated a significant difference of test anxiety between males and females, with females scoring higher on both scales, thus indicating higher levels of test anxiety. Several studies have indicated that females generally score higher on the worry component of test anxiety (Everson & Millsap, 1991; Turner, 1985; Williams, 1994). Research has shown that this is the most detrimental aspect, so it is no surprise that due to this difference it is perceived that females are more highly test anxious (Everson & Millsap, 1991).

Many different populations were tested to discover if test anxiety was an age-related phenomenon. The researchers conducted a study using Canadian high-school students and compared their results with the results of existing literature concerning other population and geographical location (Gierl & Rogers, 1996). The base study used 724 (335 male and 389 female) “school-leaving” Canadian high-school students. The overall results found no significant

difference between males and females in general test anxiety for all ages studied. Unfortunately the researchers did not reveal the age range of the subjects.

There was some evidence that females are more anxious than males during the later high school and college years, though it was not statistically significant (Benson & Tippets, 1990; Everson & Millsap, 1991; Gierl & Rogers, 1996). This finding could result in further study not only in test anxiety and gender difference, but if there is a significant difference between test anxiety and between chronological age as well, there could be a combination of variables that indicate differences in test anxiety. Although the authors assert that despite the lack of significant difference between the genders, the raw means showed a difference and this factor alone should warrant the continued use of separate norms when using Test Anxiety Inventory (Spielberger et al., 1980). This area must be further explored before any concrete assumptions and implication can be discussed.

In addition to chronological age of populations being tested, several studies have compared different cultures with regard to test anxiety (El-Zahhar, 1991; Guida & Ludlow, 1989; Mwamwenda 1993; 1994). The study by Guida and Ludlow (1989) examined test-anxiety differences between American and Mexican elementary and secondary school children. The results indicated that Mexican schoolchildren had higher levels of test anxiety than their American counterparts. Also, a study by El-Zahhar (1991) found that college students of Egyptian, Turkish, and Saudi Arabian descent have significantly higher test-anxiety levels than their American counterparts. These findings need to be further investigated to discover if there are sex differences within the various cultures or if test anxiety can be attributed not to sex but to cultural descent. There have been various theories about the causes of test anxiety, ranging from test item arrangement/type of test (Crocker, Schmitt, & Tang, 1988; Klimko, 1984) to the effects

of sleep and test anxiety/exam performance (Horn & Dollinger, 1989). Although some students did perform better under various testing conditions, none of the conditions were statistically significant with regard to gender differences in test anxiety. Because there were no significant gender differences within these studies, the results could imply that causality of test anxiety is not related to exam instrumentation or environmental confounding variables. The study of gender differences alone may be further researched due to these findings.

Also, some of the differences in test anxiety have been attributed to societal expectations. Some research has indicated that males are less likely to be completely honest on reporting test anxiety (Hill & Sarason, 1966; Silvestri, 1986; Sowa & LaFleur, 1986; Zoller & Ben-Chaim, 1990). This societal pressure on males not to admit weaknesses may be the cause of the differences sometimes found in general test-anxiety measures (El-Zahhar, 1991). To further investigate this research finding, more studies specifically on male behavior and the validity of male self-report measures must be conducted.

Although there is research that has indicated that there is no general test anxiety difference between males and females, some studies have indicated that there are significant differences in test anxiety specifically with regard to mathematics and science courses (D'Ailly & Bergering, 1992; Onwuegbuzie, 1995; Williams, 1996; Yates, Hannell, & Lippett, 1985; Zoller & Ben-Chaim, 1990). More research must be performed to see if test anxiety is discipline specific when testing significant differences between the genders. If the differences are indeed gender and discipline specific, then these two variables together must be further explored. So far, there has only been research conducted on one variable at a time. There have also been indications that there is not only a difference in gender and discipline areas, but also in chronological age (Gierl & Rogers, 1996).

More importantly, it may not be one variable alone that indicates a significant test-anxiety difference, but a combination of factors. By exploring the options about the causes of test anxiety, researchers, curriculum designers, and instructors may become more effective in their profession and be able to modify their approaches to education to accommodate differences in levels of test anxiety. This cannot be achieved until sufficient evidence has been presented regarding the variable causing the most significant differences in test-anxiety variability.

Finally, previous research findings have indicated that there are differences in how the students study which result in experiencing anxiety when attempting to recall that information. This may indicate that the cause of the anxiety is not necessarily gender or test driven, but the etiology being how the individual studies in the first place. A study by Richardson (1993) used the Approaches to Studying Inventory (ASI) to determine students' approaches to studying as well as if there is a gender difference within the approaches. The ASI measures several approaches to learning, which are included in three categories: context, content, and demands. The students, of course, had different studying and retention rates depending on the perceived importance and interest in the subject matter. The results indicated that there are statistical differences between males and females on the ASI, thus indicating different studying styles. The disadvantages to the ASI are that there have been sampling biases and that some of the subscales are not protected from Type I Error.

With this type of research, one may be able to infer that it is not the test anxiety at all that is separated by gender differences, but it is the learning styles that cause test anxiety, and it is these learning styles that have gender differences. No further conclusions may be made at this time concerning this issue; however, it is an area to keep in mind for further research.

In conclusion, although the body of literature concerning test anxiety is expansive, there is little agreement among the research as to how to measure this phenomenon, the causes of test anxiety, sex differences, cultural differences, or age differences. These areas must be further researched before anything may be done to try to rectify the situation or treat individuals suffering from test anxiety.

CHAPTER THREE

METHOD

Participants

The participants were 155 (53.4%) male and 135 (46.6%) female undergraduate students attending West Virginia University. The mean age for the males in this sample was 19.78 ($SD=1.71$) with a range from 18 to 27. The mean age for females in this sample was 19.77 ($SD=2.40$), with a range from 18 to 43. The mean age for the entire sample was 19.78 ($SD=2.10$). The frequency and mean data are illustrated in Appendix A. The participants were a convenience sample due to the fact that they were readily available through cooperating departments and professors within West Virginia University. The participants were enrolled in various courses offered by either the Psychology Department in the College of Arts and Sciences or the Educational Psychology Department in the College of Human Resources and Education.

Measures

The participants were administered a modified anxiety survey by Suinn (1971) titled The Suinn Test Anxiety Behavior Scale (STABS), to obtain data regarding test anxiety. The survey was designed to measure test anxiety exclusively. The Suinn Test Anxiety Behavior Scale is a self-report measure containing 50 items. For the purpose of this testing, an abbreviated version targeting certain behaviors was utilized. The modified survey contained 20 test items (See Appendix B) and they were rated on a scale of 1 to 5 with a report of one (1) being the least amount of anxiety experienced and a report of five (5) being the most amount of anxiety, thus, a low score means low anxiety and a high score reflects a high level of self-reported anxiety. The modified instrument targeted test-taking behaviors dealing exclusively with the time periods surrounding an actual test. There is no reported change in reliability and validity with the

abbreviated version. Each item represented an anxiety-arousing situation, and the participants responded using a Likert-type scale ranging from (1) “Not at All”; (2) “A Little”; (3) A Fair Amount; (4) Much; and (5) “Very Much.” The test-retest reliability coefficients are 0.74 (over a six-week period) and a 0.78 (over a two-week period). The use of the STABS was due primarily to convenience and cost. The STABS is comparable to other test anxiety measures as far as test-retest reliability and validity on the measure of generalized test anxiety.

To further ascertain the validity of the Suinn Test Anxiety Behavior Scale, a Pearson Product Moment correlation was calculated between the STABS and a one-shot question that asked participants to identify their level of test anxiety rating from 0 (no anxiety at all) to 10 (severe test anxiety), $r(290)=0.60, p<0.01$ (Table 7). Also, the validity, according to correlation between STABS and the Test Anxiety Scale (TAS) is 0.60. Gender indication was required to determine if there was a significant difference between males and females. Lastly, participants were asked to identify their biological sex (155 males and 135 females), their school classification (151 freshmen, 47 sophomores, 61 juniors, and 31 seniors), and their chronological age (ages 17 to 43).

Design

A survey by Suinn (1971) was used for a One-Way Analysis of Variance for the independent variable of gender (male and female) and the dependent variable of the test anxiety score on the on the STABS.

There was also a One-Way Analysis of Variance calculated using the independent variables of gender (male and female) and age (17-43) with the dependent variable of the test anxiety score on the STABS.

In addition, a One-Way Analysis of Variance was calculated using the independent variable of class rank (freshman, sophomore, junior, and senior) and dependent variable of the test anxiety score on the STABS.

Finally, a regression test for the independent variables gender (male and female) and age (17-43) and dependent variable of the test anxiety score on the STABS. A multiple linear regression model was used. The variable for class rank, which had four (4) levels, and the age variable were continuous variables.

Procedure

The participants' instructors administered the surveys in classrooms on the Evansdale Campus of West Virginia University during regular class time in Educational Psychology courses. The surveys were also administered in a designated classroom on the Downtown Campus of West Virginia University in conjunction with the Psychology Department subject recruitment board by the primary researcher.

The design of this study used a modified test anxiety survey by Richard Suinn (1971). The Suinn Test Anxiety Behavior Scale (STABS) was given to current undergraduate students to ensure that recall about test anxiety was not a distant memory. The questions on the survey pertained to physiological reactions as well as perceived emotional change. The questions pertained to the amount of anxiety at specific times including, before an exam, during an exam, and after the completion of an exam. There was no mention on the survey or by the administrator concerning the subject matter of the exam. The subjects were instructed to think about exams in general and not a specific subject. The participants were also instructed to indicate sex, age, and class rank. They then were then instructed to indicate their reactions to the situations on a five-

item Likert-type scale. The data results were compiled and separated according to demographic information.

The surveys were presented by the classroom instructors and researcher along with comments concerning honesty and accuracy so that the results were true to nature and less likely to be skewed by subject bias. The instructors and researcher also stressed the importance of the gender indication so that all available surveys were utilized. Finally, the instructors and the researcher detailed that this was a voluntary action to aid someone in the completion of thesis work. The subjects were asked to answer as honestly as possible and the hypotheses were not revealed to further ensure honest responses. The experimenter and/or instructor was physically present in the room to ensure that the participant completed the gender portion of the survey before exiting the data collection facility.

CHAPTER FOUR

RESULTS

The first major question in this study examined whether there would be a significant difference between males and females and their score on the Suinn Test Anxiety Behavior Scale (STABS). To analyze this question, a One-Way ANOVA was conducted. The descriptive statistics for the independent variable, gender, as a function of the dependent variable, the test anxiety score on the STABS, are reported in Table 1 and the actual statistical measure, as reported in Table 2, did not indicate that there was a significant difference between gender on test anxiety, with $F(1, 288)=0.586, p>0.05$.

Due to previous indication that age is a possible variable related to test anxiety, a multiple regression was performed to account for this suspected variability. A multiple regression analysis was conducted to determine how well biological sex and age predicts a person's score on the Suinn Test Anxiety Behavior Scale (STABS). As shown in Tables 3, 4, and 5, the linear combination of biological sex and age did not relate to a person's score on the STABS, $F(2, 287)=0.293, p>0.05$.

The next major question in this study set out to determine whether a person's class rank was related to his or her score on the STABS. As shown in Table 6, the class rank variable functions as an ordinal variable, a Spearman Rho was calculated. A negative relationship was found between an individual's classification and his or her score on the STABS with $\rho=-0.231, p<0.0001$, thus the level of class rank the higher the score on the STABS.

Also, using a One-Way ANOVA, it was investigated if there was a significant difference in test anxiety scores on the STABS between males and females when age was controlled for as

a possible co-variate. This finding was not significant with $F(1,287)=0.584$, $p>0.05$, as shown in Table 9.

Finally, it was hypothesized that there would be a significant difference between lower level and upper level students. To conduct this test, a One-Way ANOVA was calculated using class rank (freshman, sophomore, junior, and senior) as the independent variable and score on the STABS as the dependent variable. A significant difference was found, with $F(3, 286)=6.95$, $p<0.0001$ as illustrated in Tables 10 and 11. This significant finding was further investigated by using harmonic means, Table 12, and a Tukey Post Hoc procedure Table 13, it was found that the class rank level of junior ($M=48.33$, $SD=15.29$) had significantly lower levels of test-anxiety scores on the STABS when compared to freshmen ($M=58.76$, $SD=15.29$). When compared to sophomores ($M=54.72$, $SD=13.35$) and seniors ($M=53.81$, $SD=17.17$), there were no other significant differences found.

CHAPTER 5

DISCUSSION

There has been many conflicting results throughout the literature with regard to gender differences and test anxiety. As indicated through this study, there are confounding variables that may result in rejecting the hypothesis when it is actually true. This is the case specifically with this study. Once the variability for class and age were taken out of the test, the test statistic indicated a significant difference. This would lead one to believe that had the researchers in the previous studies taken into account the variables, such as age, the studies may have netted different conclusions.

This phenomena needs to be further studied to assure that the age variable was not a factor specific to the sample collected in this study. The more valid the study, the greater the implications for treatment and future research. Not only may age and class have been a factor in test anxiety, but also the notion of trait anxiety versus state anxiety may be further researched (Spielberger, Gorsuch, & Loshene, 1970). There may be factors linking trait anxiety to females that have nothing to do with the construct of testing.

A trait is a biological factor that is maintained across situations, whereas a state is an event that is specific to a given stimulus and changes within stimulus events. If females are significantly different from males in trait anxiety, then the research would consistently indicate that females experience higher test anxiety due to the very nature of anxiety. This trait anxiety may also change how one actually studies for an exam. This trait would then be affecting learning style and recall of encoded material. This avenue of research has not been taken, but to alleviate a biological trait question, further research in this area must be done.

Also, as indicated in previous research, there are not only gender differences, but differences between cultures (El-Zahhar, 1991; Guida & Ludlow, 1989). This is another variable that must be further examined within the confines of test anxiety. The present study was limited in the availability of diverse cultures; however, it is very feasible that future research may not only compare cross-culturally, but also within cultures with regard to gender differences. It may be found that as a culture the individuals are either more or less prone to higher levels of test anxiety.

Most of the research available has been conducted on American students, and it may simply be a phenomenon of Americans in general having lower levels of test anxiety across the board than other cultures.

Until there is precise variable accountability within the construct of test anxiety, the field will never know what is neither the cause nor what variables affect the measurement of test anxiety. There must be a wider body of research including several of the aforementioned variables to account for the variability within the test statistic.

This inquiry of research must be completed before any type of attribution of characteristics may be decided. Although there is no clear answer as to the causes of test anxiety, nor are there any definitive predictors, test anxiety is a very treatable affliction. However, until more is known about the actual occurrence of this phenomenon, treatment may be trial and error.

There are many different therapeutic approaches with regard to gender differences, and if test anxiety is shown to be gender-specific, then programs addressing this may be implemented to help female students become equal to their male counterparts. By studying the therapeutic approaches, one may be able to trace back the etiology of test anxiety. This backwards logic could indicate whether test anxiety is a function of a biological trait, gender, or situation specific.

To date, the research has indicated a worldview of treatment of test anxiety and has applied many different approaches. This eclectic view seems to be tailored for the specific individual, and no clear research findings have indicated a preferred method that is effective across genders, ages, and cultures.

Although there is no single answer or agreement on theoretical orientation when dealing with test anxiety, there is agreement with regard to the definition of the construct. This definition includes: (a) lack of trust in individual coping abilities and self-supportive system; (b) a tendency to misread external cues within the environment and thus overload internal channels; (c) inability to adequately prepare preceding an exam; (d) a tendency to devote less time to studying; and (e) less time focusing on actual exam material, thus performing poorly on the exam (Seroke, 1991). Different researchers have approached this problem in a variety of ways. Seroke (1991) conducted a single-subject qualitative study using Gestalt therapy for the treatment of test anxiety. The individual was able to cope better within the testing situation, and her grade point average increased, but further testing by the researcher indicated a suspicion that although the individual was better able to cope with the test anxiety, the anxiety was due to a biological trait, and there was no real “cure.” All that could be taught were coping skills to better deal with the trait (Seroke, 1991; Spielberger et al., 1970).

There are several problems with comparing single-subject, qualitative research findings with the present study. The present study utilizes empirical, quantitative research. The very nature of the two different types of research causes problems when attempting to compare findings. Qualitative research has a high likelihood of having Type I errors due to lack of subjects; however, quantitative research tends to lack in overall human rationalization and close

observational study. The appropriateness of which type of research to conduct depends upon the goals of the research.

It is important not only to examine the etiology and possible variables contributing to the manifestation of test anxiety, but also to examine the different methods of alleviating this affliction. There is clearly a need to study test anxiety because it has been shown to exist; however, as shown by this study, general test anxiety gender differences have not been found. Mere study of the phenomenon is not enough in the academic arena. In addition to contributing to the reduction of test anxiety for the individual, studying the methodology of test anxiety reduction may lead to further indications of its causes. It is important to clearly define the etiology, and studying successful treatments may do this.

A few other studies indicated that test anxiety will decrease with learned study skills as well as cognitive-behavioral therapy (Kennedy & Dopeke, 1999; Meichenbaum, 1972; Romain, & Verdick, 2000). Romain and Verdick (2000) stated that anxiety will be lowered if the individual knows what is going to be on the exam as well as how to take the exam. These researchers stressed redefining test taking to indicate it to be a meaningful learning tool and not being associated with an aversive experience.

Kennedy and Dopeke (1999) took a strictly behavioral approach to treating test anxiety. The researcher in this study described the advantages of progressive muscle relaxation (PMR) in addition to systematic desensitization (SD) (Crouse, Deffenbacher, & Frost, 1985; Lent & Russell, 1978). This study was a qualitative study detailing a single subject and the progress through sessions using SD and PMR. The subject progressed through a hierarchy of anxiety-inducing situations with regard to testing situations. The participant rated the level of anxiety using the Subjective Units of Distress Scale (SUDS). The SUDS scale measures the level of

anxiety perceived on a scale of 0-100, with 100 being the most unbearable. After nine treatment sessions the participant reported significantly lower SUDS scores, with no score above 30.

Of course, there are other methods of treatment for test anxiety; however, the focus of the study was not on treatment but on defining variables within the construct. Effective treatment cannot be standardized or perfected until the causes and affecting variables of test anxiety are finally defined and tested statistically. To truly pinpoint the different aspects within the construct, the body of research must become less disjointed and start to become more cohesive. This study is simply a minor detail in the overall picture; however, many valid inquiries about the variables within test anxiety have been brought to light, such as if the class rank of the student has an effect on the level of test anxiety. This significant finding may simply be unique to this sample; however, it is an aspect that warrants further study. These questions concerning the true nature of test anxiety cannot be answered until all possible facets have been tested and either eliminated or accepted as part of test anxiety.

As shown by the present study, the findings of no significant differences across the board, with the exception of junior status students showing a significantly higher score on the STABS than freshmen status students, should further indicate that the need to find generalized test anxiety has been fulfilled and now efforts must be concentrated on finding the true etiology and studying the phenomena on a micro level.

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Appendix A

Frequency Data for Gender, Class, and Group Variables

Variable	n	Percentage (%)
Gender		
Male	155	53.4
Female	135	46.6
Class		
Freshman	151	52.1
Sophomore	47	68.3
Junior	61	21.0
Senior	31	10.7
Group		
College of HR&E	126	43.4
College of Arts and Sciences	164	56.6

Appendix B

Frequency Statistics for Age

Variable	<i>M</i>	<i>Mdn</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Male Age	19.78	19.00	1.71	17.00	27.00
Female Age	19.78	19.00	2.40	18.00	43.00
Age Total	19.78	19.00	2.06	17.00	43.00

Appendix C

Suinn Test Anxiety Behavior Scale Measurement Tool

Demographic Questions:

1. Age
2. Class Rank
3. Biological Sex
4. Scale of 0-10, 0 being the least amount of anxiety and 10 being the most, please rate your perceived test anxiety overall

STABS

Instructions: Please indicate the amount of test anxiety experienced in general to the following statements (Likert-type Scale: (1) Not at all, (2) A little, (3) A fair amount, (4) Much, (5) Very much).

1. Rereading the answers I gave on the test before turning it in
2. Sitting down to study before a regularly scheduled class
3. Turning in my completed test paper
4. Hearing the announcement of a coming test
5. Having a test returned
6. Reading the first question on a final exam
7. Being in class waiting for my corrected test to be returned
8. Seeing a test question and not being sure of the answer
9. Studying for a test the night before
10. Waiting to enter the room where a test is to be given
11. Waiting for a test to be handed out
12. Waiting for the day my corrected test will be returned
13. Discussing with the instructor an answer I believed to be right, but which was marked wrong
14. Seeing my standing on the exam relative to other people's standing
15. Walking to see my letter grade on the test
16. Studying for a quiz
17. Studying for a midterm
18. Studying for a final
19. Discussing my approaching test with friends a few weeks before the test is due
20. After the test, listening to the answers my friends selected

Table 1

Descriptive Statistics for Gender as a Function of Test Anxiety Score

Variable	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>Min</i>	<i>Max</i>
Male	54.72	15.07	1.21	24.00	93.00
Female	56.14	16.48	1.42	20.00	88.00
Total	55.38	15.73	0.92	20.00	93.00

Table 2

One-Way Analysis of Variance for Effect of the Independent Variable of Gender on the Dependent Variable of the Test Anxiety Score on STABS

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Between groups	1	145.12	145.12	0.59	0.45*
Within groups	288	71371.40	247.82		
Total	289	71516.51			

* $p > .05$

Table 3

Summary of the Independent Variables Gender and Age Predicting the Dependent Variable of Test Anxiety Score on the STABS

Variable	R	R ²	Adjusted R ²	SE Estimate
Gender + Age	.045	.002	-.005	15.77

Table 4

Summary of Regression Analysis for the Independent variables Gender and Age Predicting the Dependent Variable Test Anxiety Score on the STABS

Variable	<i>B</i>	<i>SEB</i>	<i>B</i>	<i>t</i>	<i>p</i>
Gender +Age	52.790	9.376		5.630	0.000
Gender	1.418	1.856	0.45	0.764	0.446
Age	2.602E-02	0.451	.003	0.058	0.954

Table 5

Multiple Regression Analysis of Variance of the Independent Variables of Gender and Age on the Dependent Variable of Test Anxiety Score on the STABS

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Between groups	2	145.94	73.00	0.29	0.75*
Within groups	287	71370.57	248.68		
Total	289	71516.51			

* $p > .05$

Table 6

Spearman Rho Nonparametric Correlation Classification of Class and the Test Anxiety Score on the STABS

Variable		Class	STABS
Class	Correlation Coefficient	1.00	-0.23**
	Significant (2-tailed)	0.00
	N	290	290

** . Correlation is significant at the 0.01 level (2-tailed)

Table 7

Spearman Rho Nonparametric Correlation for a Validity Check with the Self-Report Measure and the Test Anxiety Score on the STABS

Variable		Self-Report	STABS
Self-Report	Correlation Coefficient	1.00	0.597****
	Significant (2-tailed)	0.00
	N	290	290

**. Correlation is significant at the 0.01 level (2-tailed)

Table 8

Descriptive Statistics for the Independent Variables of Gender and Age as a Function of the Dependent Variable of the Test Anxiety Score on the STABS

Variable	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>Min</i>	<i>Max</i>
Male	19.78	1.71	0.14	17.00	27.00
Female	19.78	2.40	0.21	18.00	43.00
Total	19.78	2.06	0.12	17.00	43.00

Table 9

One-Way Analysis of Variance for Effect of the Independent Variable of Age on the Dependent Variable of the Test Anxiety Score on STABS

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Between groups	1	5.93E-04	5.93E-04	0.00	0.99
Within groups	288	1221.88	4.24		
Total	289	1221.88			

* $p > .05$

Table 10

Descriptive Statistics for the Independent Variables of Class Rank as a Function of the Dependent Variable of the Test Anxiety Score on the STABS

Variable	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>Min</i>	<i>Max</i>
Freshman	58.76	15.29	1.244	23.00	92.00
Sophomore	54.72	13.35	1.95	24.00	79.00
Junior	48.33	15.57	1.99	20.00	83.00
Senior	53.81	17.17	3.08	30.00	93.00
Total	55.38	15.73	0.92	20.00	93.00

Table 11

One-Way Analysis of Variance for the Effect of the Independent Variables of Class Rank on the Dependent Variable of the Test Anxiety Score on the STABS

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Between groups	3	4857.41	1619.14	6.95	0.00*
Within groups	286	66659.10	233.07		
Total	289	71516.51			

* $p < .05$

Table 12

Post Hoc Test of Tukey HSD Using Harmonic Means on the Independent Variables of Class Rank and the Dependent Variable of test Anxiety Score on the STABS

<i>Class (a)</i>	<i>Class(b)</i>	<i>M Diff. (a-b)</i>	<i>SE</i>	<i>p</i>
Freshman	Sophomore	4.04	2.55	0.39
	Junior	10.43*	2.32	0.00
	Senior	4.96	3.01	0.35
Sophomore	Freshman	-4.04	2.55	0.39
	Junior	6.40	3.00	0.14
	Senior	0.92	3.53	0.99
Junior	Freshman	-10.43*	2.32	0.00
	Sophomore	-6.40	3.00	0.14
	Senior	-5.48	3.37	0.36
Senior	Freshman	-4.96	3.01	0.35
	Sophomore	-0.92	3.53	0.99
	Junior	5.48	3.37	0.36

**The mean difference is significant at the 0.05 level*

Table 13

Harmonic Means of the Independent Variables of Class Rank

<i>Variable</i>	<i>N</i>	<i>Harmonic Mean</i>
Freshman	151	58.76
Sophomore	47	54.72
Junior	61	48.33
Senior	31	53.81