Teachers' Ability to Identify Anxiety in the Classroom and Generate Related Interventions

Susan Jane Oliverio

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TEACHERS’ ABILITY TO IDENTIFY ANXIETY IN THE CLASSROOM
AND GENERATE RELATED INTERVENTIONS

A Dissertation

Submitted to the School of Education

Duquesne University

In fulfillment of the requirements for
the degree of Doctor of Philosophy

By
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May, 2013
Teachers' Ability to Identify Anxiety in the Classroom
and Generate Related Interventions

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ABSTRACT

TEACHERS' ABILITY TO IDENTIFY ANXIETY IN THE CLASSROOM
AND GENERATE RELATED INTERVENTIONS

By
Susan Jane Oliverio

May 2013

Dissertation supervised by Ara J. Schmitt, Ph.D.

The negative impact of test anxiety has been well documented in the literature with empirical studies demonstrating the existence of a negative relationship between test anxiety and academic performance (Schwarzer, 1990; Seipp, 1991). In 1967, test anxiety was determined to be a problem for 10% of school aged children (Klondas). A decade later, studies suggested this rate was closer to 25 or 30% (Nottelmann & Hill, 1977). In a study of a Pittsburgh area school district, Beidel (1991) found clinically significant Test Anxiety Scale for Children (TASC) scores in 34% of students in a suburban school district that is predominantly white and has a middle to upper socioeconomic status, and 36% of students in an urban district comprised of mixed racial and socioeconomic groups. This data suggests that the prevalence of test anxiety has increased over time. Teachers are in a unique position to assist students in managing their anxiety through
research based intervention and behavioral techniques. The results of this research will
determine how much information is beneficial to the teacher in order for them to provide
the best services for students who present with test anxiety. The role of the school
psychologist will also be examined.
DEDICATION

I dedicate this dissertation to the students, teachers and school psychologists who may benefit from the information it provides. Also, to my former students who sat tirelessly through assessments I subjected them to. Please remember, “The more that you read, the more things you will know. The more that you learn, the more places you'll go” (Seuss, 1978).
ACKNOWLEDGEMENTS

During this journey, I have received support and encouragement from a great number of individuals. Dr. Ara J. Schmitt has been a mentor, an advisor, and a colleague who has always provided me with straightforward, rational advice along with encouragement. His guidance has made this a thoughtful and rewarding journey. I would also like to acknowledge the school psychologists, administrators and teachers for generously sharing their time and ideas. Their contributions made this research possible. Finally, I’d like to thank my parents for supporting and nurturing my academic pursuits from Kindergarten through to the completion of this degree and my husband for his encouragement and patience. I could not have realized these dreams had it not been for my family’s unwavering support.
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Chapter I

Introduction

Evaluation is an essential activity for educators as data is needed to make appropriate decisions regarding instruction and interventions, and to update parents with the status of their child’s learning. To gather the needed data, educators must develop procedures to gauge the students’ knowledge and skills. Tests are historically the means by which teachers gather this summative information. Formally defined, a classroom test is a set of questions, problems or exercises for determining a person's knowledge or skill level (Test, 2011).

Teachers provide instruction to students to facilitate the students’ achievement in attaining goals. Assessment results provide information to both the teacher and student regarding the final outcome or success of the instruction (Genesee & Upshur, 1996). In this way, assessments and other forms of evaluation are linked to instruction. For example, teachers use assessment data to determine if instruction was effective, if students need more instruction, if students are ready for the next step, or if a different approach to instruction is required (Prozesky, 2001).

Examination stakes in our educational system are rising. The No Child Left Behind Legislation has aimed to simultaneously require local school districts to annually measure student progress through standardized testing, as well as holding schools accountable for not making adequate yearly progress towards improving scores on these tests (No Child Left Behind Act, 2008). School funding as well as reputations are at stake yearly as the results are made public and individual schools are critiqued. In the past
decade, schools have been increasingly under pressure to raise student achievement. High stakes testing has become a way of life for most students and teachers.

The pressure to perform has been felt by students, teachers and administrators in education, and the frequency and intensity of exams appear to be increasing. As well as informing the teacher and student of their progress towards educational goals, the results of assessment are often used to determine educational honors, admissions, and graduation. The pressure to do well on these tests and to achieve academic success in general, is impacting students at younger and younger ages. With the increasing emphasis on testing and the associated high stakes, many students find testing an anxiety-provoking activity.

Anxiety is a normal response to a situation perceived to be threatening (American Psychological Association, 2011). With respect to testing, research indicates that moderate levels of anxiety can actually motivate students to study and perform well (Alpert & Haber, 1960; Zeidner, 1998). However, high anxiety levels may interfere with the student’s ability to perform well on tests and result in an underestimation of the student’s knowledge (McDonald, 2001). When this occurs, the student is thought to have “test anxiety.” Test anxiety is defined as a specific form of anxiety that results in a combination of cognitive and physical responses that are aroused in testing or in similar situations in which a person believes that he or she is being personally evaluated (Cizek & Berg, 2006).

**Significance of the Problem**

Testing is a major source of concern for many school aged children (McDonald, 2001). In 1967, test anxiety was determined to be a problem for 10% of school aged
children (Klondas, 1967). A decade later, studies suggested this rate was closer to 25 or 30% (Nottelmann & Hill, 1977). More recently, Turner et al. (1993) found 41% of African American children aged 8 to 12 years experience elevated test anxiety scores on the Test Anxiety Scale for Children (TASC). In a study of a Pittsburgh area school district, Beidel (1991) found clinically significant TASC scores in 34% of students in a suburban school district that is predominantly white and has a middle to upper socioeconomic status, and 36% of students in an urban district comprised of mixed racial and socioeconomic groups. The rates of clinically significant test anxiety reported by Turner Biedel, Hughes, and Turner, (1993) and Beidel (1991) are almost two times greater than those reported earlier using the same instrument (Eysenck & Rachman, 1965; S.B. Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960). This data suggests that the prevalence of test anxiety has increased over time.

The negative impact of test anxiety has been well documented in the literature with empirical studies demonstrating the existence of a negative relationship between test anxiety and academic performance. In a meta-analysis of 126 American and European studies, a negative correlation of $r = -0.21$ between test anxiety and academic performance was found (Seipp, 1991). Based on these findings, Seipp reported that low-test-anxious students would outscore high-test-anxious students by almost half of a standard deviation and that only 39% of low-test-anxious students would fail, whereas 61% of high-test-anxious students would fail. In a meta-analysis, Schwarzer (1990) reported the same negative correlation of $r = -0.21$ between test anxiety and academic performance reporting that this meant that approximately two thirds of low-test-anxious students would score higher than the average high-test-anxious student.
Features of Test Anxiety

Test anxiety is manifested cognitively, behaviorally, emotionally and physiologically (Spielberger et al., 1978). Physical symptoms commonly include headaches, upset stomach, nausea or heart palpitations (Zeidner & Mathews, 2005). Emotional symptoms are characterized by excessive fear, worry or anger (Owen-Yeates, 2005; Putwain, 2009b). Behavioral presentations of test anxiety include procrastination, avoidance, poor study and test-taking skills, and inattentive/distracted behaviors during the tests. (King, Ollendick, & Gullone, 1991). Finally, cognitive symptoms include memory impairment or negative self-talk. In an exploratory study of test anxiety, it was suggested that the cognitive deficits described by test-anxious students resulted in lower examination performance. These students were characterized by a tendency to imagine negative outcomes that had no basis in reality – a type of cognitive distortion (Putwain, 2009a).

Test anxiety is a complex construct that encompasses worry, self-preoccupation, physical upset, disruptive feelings and maladaptive behaviors. It is when these symptoms of test anxiety interfere with student performance that it becomes important for teachers to be able to identify the problem and provide appropriate intervention.

Theoretical Basis of Test Anxiety

Spielberger and Vagg (1995) describe the transactional process of test anxiety as being situation specific and involving a sequence of events. The transactional process model distinguishes among a series of events that takes place during an evaluative situation. In this model, test anxiety is triggered by either an external stressor, such as an upcoming examination or internal stimuli such as thoughts of failure. The impending test
and thoughts of failure progress to thoughts of personal competence deficits, avoidant motivation, self-blame and meta-cognitive beliefs resulting in increases in state anxiety. This increase in state anxiety results in impaired test performance (Lowe et al., 2008; Zeidner, 1998).

Situation specific events include the examination itself (e.g., stressor), the student’s subjective interpretation about the stressor as more or less intense (e.g., threat), the emotional states that are experienced during an exam (e.g., anxiety), cognitive appraisals (e.g., irrational thinking), coping strategies (e.g., avoidance), and consequences (e.g., exam performance). Because anxiety includes both cognitive and emotional aspects, the transactional process model suggests the most effective treatment programs for test anxious students include environmental, behavioral, cognitive and affective focused treatments.

When a student perceives a test as threatening, the student may experience an increase in cognitive manifestations of test anxiety such as self-centered and self-derogatory worry. When these negative cognitions are determined to contribute to poor test performance, cognitive based interventions have been found to provide significant improvement in negative thoughts. Likewise, when physiological symptoms of anxiety are determined to be interfering with student performance, teachers can also be involved in providing interventions designed to combat the physiological symptoms of anxiety. To effectively combat the negative effects of test anxiety, professionals providing intervention may need to consider what sorts of extraneous variables may influence student performance and base interventions and instructional modifications on how test anxiety manifests in individual students.
Consequences of Test Anxiety

Early research of test anxiety found test anxiety to have a facilitative effect during an exam resulting in enhanced performance (Alpert & Haber, 1960; Zeidner, 1998). Despite the facilitative effect of test anxiety on some students, many studies have shown that anxious children have difficulty attending to relevant task information (Hill & Wigfield, 1984). Observations of fourth and fifth grade students performing an anagram task found that the high anxious students were off task more often, asked fewer questions of the teacher and performed more poorly than low test anxious students (Nottleman & Hill, 1977). In a more recent study by Keogh and French (2001), it was found that test anxious students tended to be more susceptible to distraction during an exam. In addition to attention and distractibility issues during an exam, test anxious students also experience difficulty in comprehending relatively simple instructions, organizing information and recalling relevant information during a test (Zeidner, 1998). Wigfield and Eccles (1989) reported that the negative relationship between test anxiety and academic achievement increases in size continuously through the school years with a zero correlation in Grades 1 and 2 to -0.44 in some groups by Grades 5 and 6. Another study reported a correlation of -0.60 between test anxiety and academic performance for the 11th grade (Fyans, 1979). These findings were corroborated by MacDonald (2001) who found the anxiety-performance association increased as students became older. Along with impaired academic performance, students who experience test anxiety also received poorer grades and a higher frequency of grade repetition (Hembree, 1988).

Identifying Test Anxiety
Many studies report that teachers are not skilled at detecting anxiety in their students (Frick, Silverthorn & Evans, 1994; Loeber, Green & Lahey, 1990). There is no research available that explores the actual ability of teachers to identify test anxiety in students. However, research does exist that has explored teacher ability to identify behaviors associated with generalized anxiety disorder (GAD). Argulewicz and Miller (1985) explored the relationship between teacher rankings of student anxiety and self-reported student anxiety. Students in five, first-grade classes participated in the study and were administered two self-report measures of anxiety. The results indicated a non-significant relationship between teachers’ ranking of student’s anxiety level and the same student’s scores on self-reported measures of anxiety. The authors concluded that based on teacher observation alone, many students may not be identified by their teacher as having problems with anxiety. Corroborating this finding, Stanger and Lewis (1993) reported that concordance rates involving teacher reports of internalizing problems on the Child Behavior Check List (CBCL) were low (teacher–child = −0.08) compared to concordance between children and their parents (child–mother = 0.30).

Other research indicates that teachers are able to accurately identify anxiety and anxiety related behaviors in the classroom. In study of 453 students in grades two through five, children identified by their teachers as anxious had significantly higher levels of anxiety (Layne, Bernstein & March, 2006). Messman and Koot (2000) compared the Teacher Report Form and Parent Report Form of the Child CBCL with child-reported anxiety on the State Trait Anxiety Inventory for Children. The findings indicated that teachers (teacher–child concordance = 0.30) were more aware of children’s internalizing problems than were parents. This research indicates that teachers are better able to
identify and rate anxiety related behaviors in their students, resulting in observations that better matched student self-report as compared to parent observations.

**Intervening on test anxiety.** Little research is available regarding teacher ability to generate appropriate interventions and instructional modifications for test anxiety. In one known study, Morris (2010) provided teachers a list of accommodations and asked them to select the accommodations that were appropriate for test anxiety such as positive self-talk, controlled deep breathing and reading directions carefully. All teachers were able to identify one or more appropriate accommodations. Teachers were also prompted to contribute accommodations for test anxiety that were not included on the original list. All of the participating teachers were able to provide accommodations not provided on the original list. These additional accommodations were found to include encouragement/confidence building, environmental changes, instructional techniques, small group and teacher assisted study. Although this study was descriptive in nature, did not provide statistical results and was not peer reviewed, it did indicate that teachers who participated were aware of classroom accommodations that were appropriate for test anxiety. This study was designed to determine whether teachers were able to identify common accommodations for test anxiety, however, did not explore whether teachers provided such accommodations to or referred students they believed to have test anxiety for further assessment. Further, this study focused on accommodations that involved changing the testing environment or student perception of the test and did not discuss interventions that may result in a decrease in test anxiety itself.

**Instructional modifications and accommodations for test anxiety.** Research has indicated that making changes to the format of tests and how the assessment is
presented to students decreased their perception of the exam as threatening (Powers, 1986). These instructional modifications do not focus on changing the anxious student, but on changing the test or testing situation. Instructional modifications are designed to be used during a testing period or on the day of an exam to assist the student on a specific task. Examples of instructional modifications may include altering examination question format (i.e., from open ended to multiple choice), altering the order of questions, downplaying the competitive nature of a test, allowing students to retake tests, allowing testing in an alternate environment, allowing the student to select a preferred seat during an exam, and providing take home exams. It is believed that by implementing these instructional modifications, teachers may create a testing environment that is less threatening for test anxious students.

The use of instructional modifications, however, is primarily based in theory and many have not been studied in actual research. For example, research that recommends the use of multiple choice formatted tests and the option to take home exams for test anxious students were based on student perception and preference and not on whether these instructional modifications resulted in an actual decrease in test anxiety (Green, 1981; Zeidner, 1987; Crocker & Schmitt, 1987; S.B. Sarason et al., 1960). Further, many instructional modifications recommended in literature for test anxious students resulted in improved performance amongst all students and did not serve to close the gap between test anxious and non-test anxious students.

There are, however, research based behavioral techniques that may assist students with the symptoms of their anxiety. For example, student who experience test anxiety may avoid the task by feigning illness and engaging in behaviors that cause the disruption
or postponement of a test. In this case, use of the Premack Principle may be efficacious in discouraging avoidant behaviors. Although research has not shown the Premack Principle to result in a reduction of test anxiety, it may effectively assist in the management of the behaviors that manifest as a result of the test anxiety. Students with test anxiety may also feel overwhelmed by the number of problems on an exam. In this case, chunking the exam into smaller sections by giving the student one page or section at a time may reduce the anxiety reaction many students experience when given a long exam. Finally, positive reinforcement has been shown to reduce test anxiety in both students in a control group and test anxious students (Kosta & Galassi, 1974). Although it does not meet the criteria as an anxiety specific evidence based intervention, it would be an effective method to reduce the anxiety of a particular student that can be used the day of the exam.

**Mental health interventions.** Therapeutic attempts to reduce test anxiety and enhance test performance have typically been directed towards the emotional or cognitive facets of test anxiety (Spielberger & Vagg, 1987; Vagg and Spielberger, 1995). These interventions are designed to be generalized across testing situations. Emotion focused treatments are designed to alleviate negative emotions experienced by test anxious students. These interventions provide a way for students to cope with and manage their anxiety responses. These are techniques that teachers can use with students in their class to provide them with the ability to manage their physiological response to anxiety. Once taught these strategies, students may employ the techniques at later dates and with other exams. Examples of these interventions may include relaxation training, systematic desensitization, journaling, and student teacher conferences to discuss feeling of anxiety during assessment. Previous research (Gonzales, 1995; Kennedy & Doepke, 1999;
Proeger & Myrick, 1980) provides data to support the effectiveness of relaxation training for secondary and college-age students. In a more recent study 16 third, fourth and fifth graders who presented with teacher reported signs of anxiety such as avoidance, crying, illness, and outbursts of anger were provided with desensitizing activities along with relaxation techniques (Cheek, Bradley, Loretta, Reynolds & Coy, 2002). These students experienced significant improvement on their reading and math standardized test scores. Parents and teachers also observed and reported a reduction in stress-reaction behaviors.

Cognitive therapy techniques may be used to reduce the worry and change irrational maladaptive thought patterns of anxious students. Cognitive therapy addresses negative patterns and thought distortions by examining how negative thoughts, or cognitions contribute to anxiety. Cognitive techniques train students to focus on task relevant thoughts and to avoid negative thought patterns. The results of cognitive therapy have been shown in research to provide anxiety relief across time and testing situations (Wise & Haynes, 1983).

Cognitive therapy has been shown to provide students with long-term relief of test anxiety symptoms. In a study by Wise and Haynes (1983), 38 test-anxious college students were assigned to either rational restructuring, attentional training, or a control group. Students who received rational restructuring were trained to identify and modify irrational beliefs while students in the attentional training group were trained to increase attention to task-relevant variables. Results suggested that both rational restructuring and attentional training were superior to the control group in reducing test anxiety and improving performance on analog tasks. Further, these treatment effects were maintained at the time of an 8-month follow-up. To further explore and compare the efficacy of
cognitive and behavioral techniques, twenty four test-anxious subjects were randomly assigned to one of the four groups: a cognitive therapy group, a desensitization group, a combined group or a control group (Kaplan, McCordick, & Twitchell, 1979). The control group continued to experience increased levels of worry and emotionality while the cognitive therapy, desensitization and combined groups experienced decreased levels of worry and emotionality. When the therapeutic groups were compared, combined treatment and desensitization were found to be less effective than the cognitive-only treatment.

Although some research suggests that teachers might be able to identify the presence of a generalized anxiety disorder, no research has studied whether teachers can identify test anxiety in a student. When a student is identified as having test anxiety, it is even less clear as to whether teachers have the knowledge, resources and tools to provide effective interventions or instructional modifications. Currently there is no research that explores the ability of teachers to generate and implement appropriate interventions and instructional modifications for students who experience test anxiety. However, current research indicates that test anxiety is on the rise (Eysenck & Rachman, 1965; S.B. Sarason et al., 1960). It is important that teachers be able to identify test anxious behaviors in their students and refer these students for further assessment to determine the nature and extent of their test anxiety. With appropriate intervention by the school psychologist, counselors and general education teachers, students who experience test anxiety may improve test performance and educational outcomes, thus closing the gap between them and non-test anxious students.

**Purpose of the Study**
This study seeks to explore the ability of teachers to identify anxiety as the underlying problem in a case study depicting student who is experiencing behaviors and symptoms related to test anxiety. This study will also examine how providing diagnostic and symptomatic information about test anxiety to teachers affects their ability to create appropriate intervention and instructional modifications for a student with test anxious behaviors. The quantity and quality of the interventions and instructional modifications will be compared among three groups of teachers who will be provided with varying levels of student and disorder-related information. Finally, the frequency that referral to a mental health professional is considered will be explored.

**Research Questions and Hypotheses**

This investigation is designed to investigate the following research questions:

**Research question #1.** When provided a case that describes a child with anxiety-related behaviors and no diagnosis of test anxiety, will teachers hypothesize that an anxiety disorder may be present?

**Hypothesis #1.** Based on prior research, teachers are better able to identify anxious behaviors when compared to parents (Messman & Koot, 2000) and are able to accurately identify anxious students in their class (Layne, Bernstein & March, 2006). Despite the findings of Argulewicz and Miller (1985) that teacher ratings of anxiety based on classroom observation did not correlate well with student report of test anxiety, it is believed that a majority of teachers will identify the presence of unspecified anxiety.

**Null Hypothesis.** Teachers will not be able to identify and anxiety disorder when provided with a case study that describes a child with anxiety related behaviors.
**Research question # 2.** Are teachers able to generate a greater number of general recommendations, interventions and instructional modifications for students with test anxiety when presented with increasing amounts of disorder information; (a) a case that describes a child with anxiety related behavior but no diagnosis given; (b) a case that describes a child with anxiety related behavior with diagnosis of test anxiety; and (c) a case that describes a child with anxiety related behavior with a test anxiety diagnosis, and general information about test anxiety symptomology?

**Hypothesis #1.** Cunningham and Wodrich (2006) found that teachers provided significantly more disease specific accommodations when provided with a case of a student with a diagnosis of diabetes as compared to teachers who were provided with a case that only included a description of behavior and no diagnosis. It is therefore hypothesized that teachers who are presented with a case that describes a child with anxiety related behavior and a diagnosis of test anxiety will generate significantly more interventions and instructional modifications when compared to teachers who are provided with a case that describes a child with anxiety related behavior only.

**Hypothesis #2.** Based on Cunningham and Wodrich’s (2006) research, providing increased disease specific information resulted in a greater number of teacher generated, disease specific accommodations compared to the no diagnosis control condition. It is hypothesized that teachers who are presented with a case that describes a child with anxiety related behavior, a test anxiety diagnosis, and additional information about test anxiety symptomology will generate significantly more interventions and instructional modifications compared to teachers who are provided a case that describes a child with anxiety related behavior only, and no diagnosis of test anxiety.
**Hypothesis #3.** Prior research from Cunningham and Wodrich (2006) indicated that providing diagnosis and additional information about a disease did not result in an increase or decrease of disease related accommodations. Therefore, it is hypothesized that teachers who are presented with a case that describes a child with anxiety related behaviors, a test anxiety diagnosis, and additional information about test anxiety will not generate more interventions and instructional modifications than teachers who are provided a case that describes a child with anxiety related behavior and a test anxiety diagnosis.

**Null Hypothesis.** Teachers will not generate a greater number of general recommendations, interventions and instructional modifications for students with test anxiety when presented with increasing amounts of disorder information.

**Research question #3.** Are teachers able to generate a greater total number of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals) for students with test anxiety when presented with increasing amounts of disorder information; (a) a case that describes a child with anxiety related behavior but no diagnosis given; (b) a case that describes a child with anxiety related behavior with diagnosis of test anxiety; and (c) a case that describes a child with anxiety related behavior with a test anxiety diagnosis, and additional information about test anxiety symptoms?

**Hypothesis #1.** Based on Cunningham and Wodrich’s (2006) study of diabetes, teachers were able to generate a greater proportion of diabetes specific accommodations when they were provided with a description of student behaviors and a student diagnosis of diabetes. Based on these findings, it is hypothesized that teachers who were presented
with a case that describes a child with anxiety related behavior and an anxiety diagnosis will generate a significantly greater quantity of anxiety related interventions and instructional modifications when compared to teachers who were provided a case that describes a child with anxiety related behavior only.

**Hypothesis #2.** Based on Cunningham and Wodrich’s (2006) study of diabetes, teachers were able to generate more disease specific accommodations when they were provided with a description of student behaviors, a student diagnosis of diabetes and classroom implications of diabetes as compared to teachers who were provided with only a description of student behaviors. It is therefore hypothesized that teachers who were presented with a case that describes a child with anxiety related behavior, an anxiety diagnosis, and additional information about anxiety will generate a significantly greater number of anxiety related interventions and instructional modifications when compared to teachers who were provided a case that describes a child with anxiety related behavior only.

**Hypothesis #3.** Cunningham and Wodrich’s (2006) found that teachers who were provided with a description of student behaviors, a student diagnosis of diabetes and classroom implications of diabetes produced a similar number of disease specific interventions and accommodations when compared to teachers who were provided with only a description of student behaviors study of diabetes and a diagnosis. It is therefore hypothesized that teachers who were presented with a case that describes a child with anxiety related behavior, an anxiety diagnosis, and additional information about anxiety will generate a non-significant number of anxiety related interventions and instructional
modifications when compared to teachers who were provided a case that describes a child with anxiety related behavior and a diagnosis.

**Null Hypothesis.** Teachers will not generate a greater number anxiety specific, research based interventions and evidence based behavioral techniques for students with test anxiety when presented with increasing amounts of disorder information.

**Research question #4.** By group, will the frequency of referral to mental health services (school psychologist, guidance counselor, referral to counseling in the community) increase when teachers are presented with increasing amounts of disorder information; (a) a case that describes a child with anxiety related behavior but no diagnosis given; (b) a case that describes a child with anxiety related behavior with diagnosis of test anxiety; and (c) a case that describes a child with anxiety related behavior with a test anxiety diagnosis, and additional information about test anxiety symptomology?

**Hypothesis #1.** Research that looks into teacher referrals for mental health services found that teachers were more likely to refer students with externalizing behaviors than students with internalizing symptoms that did not disrupt the class (Pearcy, 1993). Further, when teachers felt a child was in need of mental health services, they were not likely to refer students due to a perception of parents as significant barriers to mental health services for children with teacher reports that they felt parents often did not follow up on suggestions or recommendations (Williams, Horvath, Wei, VanDorn & Jonson-Reid, 2007). Based on these findings, it is hypothesized that teachers will be more likely to make a mental health referral when presented with overwhelming evidence of an anxiety disorder (anxiety diagnosis and/or additional information about test anxiety...
symptomology) when compared to the teachers who were presented with a case study alone.

Null Hypothesis. Based on Pearcy (1993) and Williams et al. (2007), teachers will be less likely to make referrals for an internalizing disorder and may avoid making mental health referrals due to perceived parental barriers, it is hypothesized that there is no relationship between teacher mental health referral and evidence of an anxiety disorder (anxiety diagnosis and/or additional information about test anxiety symptomology) when compared to the teachers who were presented with a case study alone.
Chapter II

In the current educational climate, teachers are required to gather and interpret information in order to report educational progress to parents. They use tests to determine whether a student has mastered new skills or acquired sufficient knowledge in a subject area. Tests are administered to assess; (a) acquisition of knowledge, (b) acquisition of skills, and (c) the student’s ability to apply knowledge and skills during practical or problem solving activities. The results of classroom based tests may be used to establish grades, monitor student progress, and to determine appropriate services for students. Tests also play a major role in determining educational admissions, graduation, and scholarship awards.

Sattler (2001) wrote, “assessment is a way of gaining some understanding of the child in order to make informed decisions” (p. 3). When properly developed and interpreted, assessments can help teachers better understand what their students have learned. Assessment can help teachers identify students’ acquisition of knowledge and skills and their ability to apply knowledge and skills to practical problem solving activities. Today’s educators are expected to collect, organize, analyze, and report on students’ progress by collecting relevant information of data. There are two different types of assessment data that educators rely on; formative and summative. Formative assessment is part of the instructional process and provides the teacher with the information needed to adjust teaching and learning while they are happening. It allows teachers to check for understanding along the way and guides their decision making about future instruction. It can also provide students with feedback so they can improve their performance. Summative assessments are given to determine what students know
and do not know. Summative assessments are usually associated with standardized tests such as state assessments, end-of-unit or chapter tests, and end-of-term or semester exams. It is summative assessment that invokes anxiety in many students that may result in performance deficits (Keating, Dalton & Davidson, 2009).

The stakes of test results increased in 2001 with the advent of No Child Left Behind (2008) which purported that that the quality of American education can be vastly improved by introducing a system of rewards and sanctions for students’ academic performance (Raymond & Hanushek, 2003). The accountability of No Child Left Behind lies in that states must show that students are making improvement, also known as adequate yearly progress (AYP). If students are not able to show adequate yearly progress in their test scores after two years, government intervention begins. After five years, schools are closed and teachers are fired to reorganize the entire system in which the students did so poorly.

Educators and researchers have argued that serious problems accompany the introduction of high-stakes testing. Psychometricians oppose high-stakes testing because using a single indicator of competence to make important decisions about individuals or schools violates the professional standards of the measurement community (American Educational Research Association, 1999). The consequences of failing to meet AYP have changed many districts’ policies towards what is taught. Debate has risen as to whether or not these high stakes tests have shifted America education towards teaching to these tests and that regular learning may be suffering. Teachers report that the pressure of doing well on a test compromises their instructional practice (Pedulla et al., 2003). Others worry that the increased pressure on students and teachers to focus on test preparation is thwarting
teachers’ intentions to care for students’ needs apart from those that lead to the scores they receive on examinations (Noddings, 2001).

Presently, students in American schools continue to receive summative and formative assessments as part of the curriculum as well as district wide assessments used to monitor and screen student performance. State-wide assessments used to determine AYP have added to the burden of assessment, with failure having consequences not only for the student, but for their teacher and school as well.

Anxiety is a normal response to a threatening situation in which the body and mind become alerted in preparation for attack or escape from a perceived threat. Research indicates that moderate levels of anxiety may improve performance during assessment, however, a great deal of anxiety may interfere with students’ ability to achieve optimal results. (Alpert & Haber, 1960). This may result in an underestimation of knowledge and skills for these students. Over the long term, poor test performance on summative assessment measures can impact a student’s current and future academic standing, entrance into college, degree achievement, and selection of occupation, with test anxious students pursuing careers that that may not challenge them mentally simply because they involve infrequent evaluation. (Ergene, 2003).

**Historical Review of Test Anxiety Research**

Before the official initiation of test anxiety research in the early 1950s, research focused on physiological and biological changes that accompany the emotional reactions experienced by students during examinations (Spielberger et al., 1978). In early research, test anxiety was viewed as a physiological arousal that was associated with the activation of the autonomic nervous system and other biological processes. In a study conducted in
1914, approximately 18% of a group of medical students taking an exam showed evidence of sugar in their urine immediately after the exam (Cannon, 1929). This research introduced test anxiety as a measurable construct, opening the doors for further investigation.

I.G. Sarason and Mandler (1952) are credited with founding the field of test anxiety by establishing and validating the construct of test anxiety. These researchers hypothesized that individuals with high test anxiety would demonstrate lower levels of task performance relative to their low test anxious counterparts. This research opened the examination of the effects of anxiety on learning and performance. S.B. Sarason, Hill and Zimbardo (1964) pioneered the development of the first self-report measure of test anxiety for both adults and children. These researchers were also the first to conceptualize test anxiety as a multi-dimensional construct that included a cognitive and affective component. Hill and S.B. Sarason (1966) conducted a longitudinal study of anxiety that tracked anxiety levels of students through their elementary school years. As a result of this study, they determined that in a classroom of 25 students, between one and three students were at high risk for developing anxiety problems which would likely interfere with learning.

In the 1960’s, Spielberger (1966) distinguished between anxiety as a relatively stable personality trait (trait anxiety) and anxiety as a more transitory state reaction to specific “ego threatening” situations (state anxiety). Based on this, test anxiety was conceptualized as a situation specific form of trait anxiety (Spielberger, 1976). After the development of the Test Anxiety Scale for Children in 1960 (S.B. Sarason et al., 1960), research has primarily focused on intervention.
Anxiety

Anxiety is defined as “an abnormal and overwhelming sense of apprehension and fear often marked by physiological signs (such as sweating, tension, and increased pulse), by doubt concerning the reality and nature of the threat, and by self-doubt about one's capacity to cope with it” (anxiety, 2011, para. 2). Symptoms of anxiety affect one’s emotions, behaviors, and physical wellbeing. Mild anxiety is vague and unsettling while severe anxiety can be extremely debilitating, and have a serious impact on daily life. People often experience a general state of worry or fear before confronting something challenging such as a test, examination, recital, or interview. These feelings are easily justified and considered normal. Anxiety is considered a problem when symptoms interfere with a person's ability to sleep or otherwise function. Anxiety occurs when a reaction is out of proportion with what might be normally expected in a situation.

Defining test anxiety. Test anxiety refers to a set of phenomenological, physiological and behavioral responses that arise as a result of concern about possible negative consequences or failure during a test or exam (Zeidner, 1998). Students who are test anxious are characterized by a low response threshold for anxiety during exams. These students view the exam process as threatening and as a result tend to react with self-derogatory cognitions, decreased self-efficacy, intense emotional reactions and arousal, and anticipatory failure and attributions at the first sign of failure (I.G. Sarason, 1986; I.G. Sarason & B.R. Sarason, 1990). Test anxiety is considered situation specific trait accounting for individual differences in the extent to which people find examinations threatening (Spielberger & Vagg, 1995). Zeidner (1998) reports that:
Test anxious students are characterized by a particularly low threshold for anxiety in evaluative situations, tending to view evaluative situations, in general, and test situations in particular as personally threatening… Test anxious behavior is typically evoked when a person believes that his or her intellectual, motivational, and social capabilities and capacities are taxed or exceeded by demands stemming from the test situation. (pp. 17-18)

**Prevalence of test anxiety.** Estimates indicate that from 10% to 41% of school aged children suffer the effects of debilitating stress during evaluation resulting in lower student performance (Erford & Moore-Thomas, 2004; Hill, 1984; Goonan, 2004; Turner et al., 1993). It is difficult to interpret these estimates because researchers have used different operational definitions and characteristics of test anxiety. Some of the estimates refer to the percentage of students who worry about making mistakes (Beidel, 1991) while other researchers made their estimates based on poor performance (Goonan, 2004). Poor performance may be related to either test anxiety or poor test taking skills. These estimates of test anxiety prevalence in American schools used different research methods, involved different samples of students at different grade levels, and relied on data collected at different times. For example, Erford and Moore-Thomas (2004) based their anxiety prevalence calculations on a sample of “school aged” students while Goonan (2004) used a sample of upper elementary aged students. Further, upper estimates of 41% were determined using a sample of African American students (Turener et al., 1993) while other studies used racially mixed samples (Goonan, 2004). This could account for some of the variability between these estimates. Despite the available information about
the prevalence of test anxiety, Zeidner (1998) concludes that “data on the prevalence and incidence of test anxiety are surprisingly sparse” (p. 6).

**Anxiety and performance.** The presence of anxiety when engaging in a task may be either be debilitating or boost performance (Alpert & Haber, 1960). Spence, Farber, and McFann (1956) found that as the overall difficulty of the task increases, the effects of anxiety will be undesirable and performance will be negatively impacted. On the other hand, anxiety may boost performance when completing easy tasks. Overall, Spence Farber, and McFann (1956) found that students with high anxiety performed better on easier tasks as compared to more difficult tasks. When a student is intelligent, has good skill level and is highly proficient on a task, anxiety is more likely to enhance rather than to detract from performance (Spielberger, 1966). However, the performance of the less able student may be impacted negatively by the anxiety. In conclusion, Spielberger (1966) suggests that anxiety may enhance test performance to a certain point, after which, test anxiety serves to decrease performance and test scores.

Several research studies have demonstrated that test instructions can influence the degree of anxiety of the test-taker. S.B. Sarason et al. (1960) demonstrated that demanding, test oriented instructions increased anxiety and resulted in lower performance in students who were already anxious. When a game like situation was used, these same students’ performance was improved. Liebert and Morris (1967) found that ego-involving instructions that emphasize the evaluative aspect of the test and negative feedback have detrimental effects on test performance. It was hypothesized that this negative impact was produced by the cognitive component of anxiety such as worry and fear of consequences, a rather than emotionality. Morris and Liebert (1970) reported that being reminded of the
importance of a test and being provided with negative feedback elevate worry and that students are able to produce their own feedback, know whether an exam is important or not and are able to evaluate how they are doing on the exam without being told by an instructor.

**Effects of test anxiety.** Despite uncertainty in the accuracy of estimates of the prevalence of test anxiety, the data that is available suggests that test anxiety affects a significant number of school children. The emphasis on assessment in schools creates a situation in which students that already have a tendency to experience anxiety encounter more pressure to perform during exams. This increased anxiety to perform well can negatively affect the students and their test scores. In brief, test anxiety can be described as constellation of cognitive, affective, physiological, and behavioral responses to evaluation. Test anxiety is a complex construct that encompasses worry, self-preoccupation, physical upset, disruptive feelings, and maladaptive behaviors.

**Cognitive.** Research evidence suggests that cognitive expressions of anxiety may be the most significant response characteristic of highly anxious people to situations in which they are being evaluated (Deffenbacher, 1980; Geen, 1987; I.G. Sarason & B.R. Sarason, 1990). Cognitive expressions of anxiety can include a preoccupation with failure, negative performance expectations, negative thoughts, lack of confidence and depreciating self-statements (Deffenbacher, 1980; Geen 1987; Wine, 1982). Smith, Ingram and Brehm (1983) demonstrated that anxious self-preoccupation occurred only in a socially evaluative situation and identified two areas of research related to cognitive expressions of anxiety; cognitive deficits research and cognitive excesses research. Cognitive or skills-deficits research examines the reduction of cognitive processes such
as retrieval, memory and attention. Cognitive excess research examines excessive
cognitions such as self-preoccupation and self-focused ruminative thoughts. Test anxious
students are severely preoccupied with self-critical, worrisome or interfering, test
irrelevant thoughts. Research suggests that the difference between high and low test
anxious individuals lie in their cognitive reactions to threatening evaluative situations
(Hollandsworth, Glazeski, Kirkland Jones & Van Norman, 1979).

In a study by Bierensbaum and Nasser (1994), it was concluded that
preoccupation with test irrelevant thoughts impacts the cognitive processing necessary for
complex tasks. During an exam, a student may misread questions, experience difficulty
understanding the nature of the questions asked and have trouble organizing thoughts.
Some research has indicated that poor performance of test anxious students is due to poor
test preparation and the individuals’ awareness that they are not prepared at the time of
the test. However, Bierensbaum and Nasser (1994) found that individuals who were well
prepared but experienced high test anxiety, had difficulty with retrieving known
information and strategies to solve problems.

Test anxious students may be distracted by test irrelevant thoughts as well as task
generated thoughts and other irrelevant task related parameters such as the time left to
complete the exam and the inability to solve problems (Deffenbacher, 1986). As test
anxious students become preoccupied with the irrelevant parts of the task, they use less
efficient strategies to solve the task at hand (Bruch, 1981).

It is commonly believed that cognitions are more likely to influence emotions and
physiology and then vice versa. Some research, however, suggests that the cognitive
component of test anxiety is more influential than affective and physiological responses to anxiety (Birebbaum & Nasser, 1994; Morris & Liebert, 1970).

**Affective.** Liebert and Morris (1967) identified emotionality as another component of anxiety. Worry refers to distressing concerns about impending or anticipated evaluative events. Worry has been defined as "any cognitive expression of concern about one's own performance" (Liebert & Morris, 1967, p. 975). Worrisome thoughts are aroused when a person perceives his or her ability to cope with an exam as poor. This worry is considered to be rooted in fears of failure, negative comparisons to peers and doubts about personal ability (Liebert & Morris, 1967). Affective arousal symptoms also include irritability, depression and agitation. The affective component of test anxiety is believed to result in the physiological sensations that are associated with arousal of the autonomic nervous system.

Zeidner (1998) suggested that worry may play a role in student’s motivation as well as in his or her ability, both real and perceived, to solve problems and master tasks. Further, literature suggests that test anxious students have a tendency to become preoccupied and self-focused when confronted with the threat of evaluation (I.G. Sarason, 1980). Test anxious students are reported to be more self-preoccupied with fear of failure and self-blame, tend to emit self-critical and self-deprecating statements and are generally less content with themselves than low anxious students (I.G. Sarason & B.R. Sarason, 1990). In this way, affective symptom in response to test anxiety, such as worry and fear, trigger the cognitive symptoms that impact test performance the most.

**Physiological.** Physiological symptoms of test anxiety can include physical responses such as sweating, racing heartbeat, nausea, trembling or rapid breathing
(Galassi, Frierson, & Sharer, 1981; Suinn, 1984). The affective component of test anxiety and the symptoms it produces are a result the sympathetic nervous system. When under stress, the sympathetic nervous system is aroused and releases catecholamines. These catecholamines increase the heart rate and blood pressure, increases the contractibility of the heart and constricts blood vessels, reducing flow the skin. Blood flow to the muscles is also increased, pupils dilate, sweat glands are stimulated and epinephrine and norepinephrine are released into the body. These physiological manifestations of anxiety may have helped human ancestors to cope with threats in their physical environment through fight or flight reactions but may be debilitating during an examination.

Current research indicates that emotionality is elicited primarily by external cues that signal the initiation of an examination. These cues can include walking into the examination room, distribution of exams or teacher behavior (Spiegler, Morris & Liebert, 1968). Further research indicates that emotionality rises sharply immediately before a test begins and gradually decreases throughout the exam (Doctor & Altman, 1969).

**Behavioral.** In addition to cognitive, affective and physiological manifestations of anxiety, test performance may also be influenced by overt behaviors that influence test performance. In a study by Culler and Holahan (1980), it was found that test anxious students presented with deficits in a wide variety of academic skills including use of class time, note taking and exam preparation. Further, high test anxious students have difficulty encoding information, organizing information and effectively employing metacognitive processes such as self-monitoring (Benjamin, McKeachie, Lin, & Holinger, 1981). These researchers found that high test anxious students experienced
more difficulty with executive functioning when compared to low test anxious students and that this deficit negatively impacted test performance.

Test anxious students often have difficulty planning, organizing and executing a plan of action. This lack of executive functioning skills often further increases anxiety levels. In response to increased anxiety, test anxious students often exhibit a variety of avoidance, escape and procrastination behaviors. Academic procrastination involves a tendency of a student to put off academic tasks. Putting off academic tasks can contribute to elevated levels of anxiety (Rothblum, Solomon & Murakami, 1986). Solomon and Rothblum (1984) identified two types of procrastinator. The first type disengages from studying due to the perceived aversion to the test, whereas the second type disengages out of fear of failure on the test. Escape and avoidance behavior may serve test anxious students as a self-protective device in reducing their distress during or immediately prior to an exam (Geen, 1987). The wish to escape a test situation is the most frequently reported negative thought that test anxious students experience during an exam (Galassi, Frierson & Sharer, 1981). In most examination situations, examinees do not believe that “escape” is a viable option. It is hypothesized that cognitive interference may be the end result of this inability to escape or disengage physically from the test situation (Carver, 1996). Geen (1987) found that high test anxious subjects show a low degree of task persistency, giving up easily on tasks they perceive as difficult. In a study by Nottleman and Hill (1977), children were grouped as high, middle and low anxiety based on their scores on the Test Anxiety Scale for Children. The high test anxious students were observed to be off-task more often and asked fewer task-related questions in class.
Together, cognitive, affective, physiological and behavioral responses to evaluation can prevent a student from performing to the best of his or her ability during an exam situation resulting in lower test scores, lower grades and grade repetition (Hembree, 1988; I.G. Sarason, 1963). In exploring a model of test anxiety, it is important to consider all facets of how test anxiety is expressed. It is a combination of the cognitive, affective, physiological and behavioral symptoms that lead to reduced performance (Spielberger & Vagg, 1995).

**Theoretical Basis**

Spielberger and Vagg (1987, 1995) proposed a transactional process model for use in the evaluation and treatment of test anxiety. This model includes several elements that are related to the presence of test anxiety. These characteristics include personality variables, situational conditions, mediating emotional and cognitive processes, short-term consequences of test anxiety and various emotion-focused and cognitive-focused intervention strategies as key elements of the test anxiety process.

Spielberger (1972) suggests that the transactional process model begins with individual personality variables of a person to react with anxiety across a variety of contexts. This suggests that test anxiety is a transitory emotional state that is determined by the interaction between a person's trait and the present situation (an exam). This tendency to react with anxiety can be triggered by the examination process. In this model, test anxious students are expected to show higher levels of trait anxiety and will tend to perceive exam situations as more threatening than students with low trait anxiety.

According to the transactional process model, a student who has the tendency to react with anxiety across many contexts will perceive more or less threat as a function of
individual differences in test anxiety and situational factors. Situational factors include the subject matter being tested, study and test taking attitudes and skills, testing environment, and teacher behaviors that may or may not contribute to feelings of anxiety. As a student perceives or appraises a test as being threatening, the student will experience an increase in state anxiety and its cognitive manifestations such as self-centered and self-derogatory thoughts and worry. These negative cognitions, test irrelevant thoughts, worry and emotionality are predicted to contribute to poor test performance.

The transactional process model involves an interaction and reciprocal influence among the elements of test anxiety process including study skills and attitudes, perceived threats and appraisals, cognitive processes, and feedback resulting in a reappraisal of the test situation as more or less threatening. These reappraisals may result in increased worry and emotionality. Cognitive processes, such as information processing and memory retrieval, can also be negatively impacted by negative appraisals of the test situation. These negative appraisals may result in further increases in worry and emotionality. In this way, increased negative cognitions may lead a test anxious student to reappraise the exam as more threatening, resulting in increased negative cognitions. The student can then become caught up in a cycle of negative appraisal with increasing anxiety reactions.

Because anxiety includes both the cognitive and emotional component, the transactional process model suggests the most effective treatment programs for test anxious students include a combination of behavioral, cognitive and emotional focused treatment. However, this model also includes an environmental and situational component which can be the subject of intervention before a student has an adverse
emotional reaction to the test situation. Teachers are in a unique position to intervene on environmental and situational stressors before the student experiences tension, physiological arousal, worry or irrelevant thoughts during the testing process.

Other models of test anxiety evaluation and intervention fail to account for all of the elements that contribute to test anxiety. For example, the cognitive attentional interference model suggests that performance differences between high and low test anxious students are caused by differences in attentional focus. These two groups differ in the type of thought to which their attention is directed during evaluation (Meichenbaum & Butler, 1980). The attentional interference model suggests that students experience deficits in retrieval of previously learned information due to interfering cognitions. Research supporting the cognitive attentional interference model found that test anxious students report higher levels of worry and emotionality during exam conditions, spend less time on task and perform more poorly than low test anxious students (Deffenbacher & Deitz, 1978). Test anxious students are reported to be more self-preoccupied and tend to worry more during an exam than low test anxious students. Test anxious students also experience significantly more self-derogatory thoughts about failure and statements of negative mood (Blankstein, Toner, & Flett, 1989). Research has supported the hypothesis that test anxious students are impaired by high arousal and self-related worrisome thoughts that interfere with assessment performance. This model, however, fails to recognize environmental and situational conditions that lead up to these intrapersonal processes. These environmental factors that can be influenced by test preparation, environment, and teacher behavior can decrease arousal states thus decreasing the negative influence of interfering cognitive thoughts.
The student experience of anxiety varies by individual. Students who experience a tendency to respond with worry or anxiety across a variety of contexts are more likely to perceive evaluative situations as threatening and experience test anxiety, a situation-specific form of trait anxiety (Spielberger, 1972). In order to assist a student who experiences test anxiety, the intervention needs to focus on the triggers of anxiety, as well as the affective, cognitive and behavioral problems associated with test anxiety. The transactional process includes all of these components and can be used to explain the experience of test anxiety and how effective interventions may be designed. Teachers in the classroom setting are in a position to intervene and assist students’ in their perception of a test situation and teach the skills that can intervene with both the cognitive, behavioral and emotional components of test anxiety.

**Intervention**

**Intervention and theory.** The transactional process model can be used as a guideline to understand and assess the effectiveness of research based interventions for test anxiety. This review of evidence-based interventions and instructional modifications for test anxiety will provide a reference that will be used to determine the appropriateness of teacher recommendations in the upcoming study.

Research suggests that examinations produced anxiety in students for the following reasons: consequences, markers of self-esteem, judgments from others, and fear appeals by teachers (Denscombe, 2000). Performance on exams can determine program placement, academic advancement, and college placement. Students often judge themselves on the basis of their grades, with higher grades resulting in an increase in self-esteem. Examination can also produce anxiety for fear of judgments from others such as
parents, teachers and other students. Finally, the repeated messages communicated to students by their teachers about the importance of exams triggers stress or anxiety in some students.

The transactional process model suggests the most effective treatment programs for test anxious students include a combination of behavioral, cognitive and emotional focused treatment. Initial research on the treatment of test anxiety focused primarily on relaxation techniques and systematic desensitization. There has been an increasing emphasis given to cognitive techniques in test anxiety research over the last two decades. Instructional modifications can serve by reducing the perceived threat of an exam, thereby decreasing an anxiety response. Interventions serve by reducing the degree of anxiety experienced by the individual when faced with the threat of examination.

**Therapeutic intervention considerations.** There are many considerations in test anxiety interventions. Fairbanks and Stinnett found that teachers prefer interventions that are less time consuming and less intrusive to the classroom (1997). This finding was corroborated by Higgins (2000) who found that special education teachers preferred less intensive and time-consuming intervention approaches. From the student’s perspective it is important to note that each student experiences test anxiety in a unique and individual way. In order to tailor a treatment intervention that addresses the specific needs and problems of the student it is necessary to carefully assess and analyze the nature of the test anxious student’s affective and cognitive problems. For some students, skills training may provide optimal outcomes whereas other students might benefit more from building self-confidence or by learning relaxation skills. No single treatment program is equally effective for all students. It is the intent of this study to determine the type of
informational background that will most effectively assist teachers in making decisions that will improve student outcomes.

**Instructional modifications.** Teachers are in a unique position to create a testing environment that is less anxiety evoking for test anxious students. Making changes to test format and how the assessment is presented to students decreases their perception of the exam as threatening (Spielberger, 1972). Accommodations are designed to allow students with test anxiety access to classes, programs and coursework by removing barriers that allow them to participate fully in their learning. The emphasis of accommodations is access, not outcomes. The teacher is able to provide accommodations that do not focus on changing the anxious student, but on changing the test or testing situation.

Test anxious students have been shown to cite task complexity as a major source of anxiety during standardized aptitude testing and believe that attempts to control task complexity when creating the assessment will help in reducing their anxiety (Powers, 1986). Based on examinee feedback, Kaplan and Saccuzzo (1989) suggested it would help motivate anxious or low achieving individuals to include a reasonable number of easier items on the exam and that questions on the exam be comprised of items that are not unnecessarily complicated or complex for the target population. Arranging test items in order of increasing difficulty decreases the disruptive effects of test anxiety and emotional arousal (Covington, 1992). By completing easier items first, students with test anxiety experience increased confidence thus minimizing anxiety symptoms at the initial stages testing (Gaudry & Spielberger, 1971). Using this technique, test anxious students do not encounter items that are too difficult for them to solve early on the exam. By arranging exam questions in order of increasing difficulty, the examinees’ perceived
probability of success increases, thus providing them with the confidence to negotiate more difficult items later on in the exam. The use of graded item difficulty has been recommended based on theory (Souma, Rickerson & Burgstahler, 2002), however, has not been subjected to peer reviewed study with test anxious students and compared with a control group.

Test anxious students have been shown to respond poorly to evaluative pressure and competition (Gaudry & Spielberger, 1971). These authors suggested that reducing ego threatening characteristics of a typical testing situation and environment should result in reduction of evaluative stress. Based on this suggestion, presenting problem-solving tasks in a neutral game like manner (Gaudry & Spielberger, 1971) and telling test anxious students that the problems are difficult and that they should not worry if they find problems challenging or complex (Hill & Wigfield, 1984) were suggested. Research based evidence, however, did not support these suggestions.

Instructions can be presented in a way that deemphasizes the importance of the task or downplays the test’s competitive nature. Dusek (1980) found that most students experience increased motivation when their attention is focused on task mastery rather than outperforming others. Test anxious students were found to benefit from pre-task instructions that emphasize task relevant strategies rather than evaluative instructions (I.G. Sarason, 1972). This study was corroborated in 1976 by Holroyd who also found that test anxious individuals can improve their performance by rehearsing task oriented instructions during the test such as, “Concentrate and keep your mind focused on the problem at hand,” and “avoid thinking about other things.” In this study, the test anxious students benefited from task oriented instructions while non-anxious students showed
I.G. Sarason (1982) reported that when test anxious examinees were provided with a supportive and reassuring environment, they were more readily able to observe and model useful cognitive strategies modeled by their teacher. By using these strategies, test anxious students became less self-preoccupied and anxious and better able to manage and guide their own behavior during an examination.

Corrective testing procedures allow students to retake tests under less stressful conditions without penalty. This procedure has been reported to help reduce anxiety and optimize the performance of high test anxious students (Arkin & Schumann, 1984). Test anxious students were reported to experience fewer concentration problems, less anxiety and to feel more in control of their performance even rating their test as less difficult when allowed to retake a test in another environment. This study, however, failed to assess test anxiety levels after corrective feedback and based conclusions on student perception of the test and their performance on the test. Further, results indicated that corrective feedback did not improve performance of test anxious students when compared to a control group that did not receive the intervention.

Covington and Omelich (1987) found, however, that providing students with a second chance to take a test under less stressful conditions enhanced the performance of both high and lows test anxious students.

Other studies indicate that multiple-choice formats are viewed as being less anxiety evoking and produce fewer interfering cognitive effects of anxiety than open-ended items (Crocker & Schmitt, 1987; Green, 1981; Zeidner, 1987). Because multiple-choice items on an exam require the recognition of a correct response, this format decreases the reliance of memory and consequently reduces the perceived complexity of
the task and resultant threat and anxiety in test anxious students. These findings indicate that students perceive multiple choice tests to be less anxiety provoking. This research, however, failed to examine students who experience test anxiety. There is no research indicating that multiple choice formatted questions result in a decrease in test anxiety or an increase in performance for test anxious students. It has been found, however, that providing students with a choice among items during a testing situation results in an increase in the examinees’ perceived feeling of control over the source of the threat (Keinan & Zeidner, 1987). In this study, regular education students in the “decision control” group were given a math quiz consisting of 5 items and were instructed to respond to any 3 of the 5 items. Students in the “no control” group were given only the first three problems and were instructed to complete them. Upon completion of the quiz, both groups were asked to respond to the State-Trait Anxiety Inventory. The results found that students tested under the “decision control” condition were less anxious and attained higher mathematics scores than those tested under the “no control” condition. This indicates that item selection effectively resulted in improved performance and reduced anxiety during a testing situation. This research, however, did not examine test anxious students and found only that item choice reduced anxiety and improved performance of all students.

It is speculated that by encouraging students to take their time, the test environment is more likely to be perceived as nonthreatening, thus reducing debilitating anxiety and enhancing performance (S.B. Sarason et al., 1960). Theoretical research suggests that eliminating time constraints and allowing more time on speeded tests increases the performance and success of high test anxious students (Hill & Eaton, 1977;
Hill & Wigfield, 1984). This theory was supported by Plass & Hill (1986) who compared test anxious student with non-test anxious students during timed tests. Results of this study found that test anxious boys received lower scores when compared to low test anxious boys. Under examination conditions with no time constraints, test anxious students experienced a reduction in test anxiety and an increase in performance.

In research conducted by Hill and Eaton (1977), test anxious students were compared to low test anxious students on timed tests. It was found that on timed tests, high test anxious students engaged in more cheating behavior and made significantly more errors when compared to low test anxious students. During untimed tests, test anxious student’s performance was comparable to the non-test anxious group. This indicates that allowing more time to complete exams may reduce the perceived threat of an exam resulting in improved performance. It is noted, however, that allowing liberal time limits during testing may not be a desirable procedure when the speed of response is the key component of the cognitive construct being assessed.

Take-home exams are another format which may provide examinees with the feeling of greater control over the exam and may be suited to the needs of high test anxious students (Zoller & Ben-Chaim, 1989). Take-home exams, however, raise concerns regarding the validity of the responses. This study found decreases in state anxiety for all students, not just those students with clinically significant test anxiety. Further, female students performed better on take-home exams regardless whether they experienced test anxiety or not. This study failed to compare test results with a control group who did the exam in the school setting. Take home exams do not provide test anxious students a better opportunity to perform at their optimum level, but allows all
students to improve their performance and is therefore, an inappropriate accommodation to provide to students with test anxiety.

Poor test performance of highly anxious students is partially caused by anxiety produced deficits in memory (Eysenck & Eysenck, 1985; Mueller, 1992). Some test anxious students have difficulty retrieving information needed to solve test problems at the time of the examination. Sieber (1969) reported that students who experienced test anxiety were more likely to take advantage of memory supports when provided. Memory supports included scaffolding, verbal reminders of rules, visual cues and diagrams. This use of memory supports resulted in improved performance. In a peer reviewed study by Sieber, Kameya and Paulson (1970), it was found that test anxiety had a disruptive effect on the functioning of short-term memory during problem solving activities and that the provision of memory supports diminished the difference in performance between high- and low-anxious students. This finding was corroborated by reports that the provision of memory support differentially facilitated the performance of high test anxious students and diminished the difference in the performance of high versus low test anxious students (Gaudry & Spielberger, 1971; Hill, 1972).

Teachers are in a unique position to be able to create an “optimal” testing environment that is perceived to evoke less anxiety for test anxious students. The aforementioned accommodations claim to optimize testing situation, however, fail to provide clear and consistent effects in reducing anxiety and enhancing performance in test anxious populations. Many of the studies fail to explain the differential impact upon the anxiety and performance of high versus low test anxious individuals. The effects of these accommodations have not been found to be consistent and uniform across
examinees. It is important for the teacher to individualize examination conditions by providing accommodations that are tailored to individual students in his or her class. It is also important that the accommodations provided do not impact the validity of the assessment.

In a study by McKeachie, Pollie, and Speisman (1955), students were found to experience less perceived threat in an assessment situation and achieve improved results when given the opportunity to comment on difficult or ambiguous test items. Students who were encouraged to write comments about the test questions achieved higher scores when compared to students with conventional answer sheets. It is believed that allowing the students to dispel some of the tensions and release emotions while writing the exam reduced the evaluative threat and channeled pent-up emotions, resulting in improved performance. Although this study did not use test anxious students and did not measure anxiety levels, it opened up the door for further study into the benefits of releasing emotions before or during an exam.

In a recent study by Ramirez and Beilock (2011), it was found that students with significant test anxiety improved their high–stakes test scores by nearly one grade point after they were given 10-minutes to write about what was causing them fear. The intervention, a brief expressive writing assignment, occurred immediately before the exam and resulted in significantly improved exam scores, especially for test anxious students. Students with test anxiety performed significantly better than students in the control group. Further, the intervention group produced scores that were similar to the scores of low test anxious students.
Emotion focused behavioral intervention. Therapeutic attempts to reduce test anxiety and enhance test performance have typically been directed towards the emotional or affective facets of test anxiety. Test anxious students frequently report high levels of arousal during testing situations and are often preoccupied with their own internal physiological processes. Emotion focused behavioral techniques provide test anxious students with coping strategies for managing physiological arousal angry activity.

Relaxation training is directed towards changing the emotional reactions of test anxious students during examinations. It is a frequently used technique because it is easy to teach and to apply during most examination anxiety arousing circumstances (Deffenbacher & Suinn, 1988). Relaxation therapy helps the student maintain a relaxed state during testing procedures which can counteract his or her aroused state. The purpose of relaxation therapy is to provide test anxious students with an effective means for coping with anxiety so that they can bring the relaxation response under voluntary control when they need it.

Specific relaxation training techniques that are popular and easy to teach to large groups include deep breathing exercises, progressive muscle relaxation training and cued controlled relaxation. Deep breathing exercises are exercises that emphasize deep breathing and mental relaxation (Meichenbaum & Genest, 1977). Controlled deep breathing lowers the heart rate as well as arousal levels. Deep breathing exercises can be used as a mechanism to help subjects control and lower levels of arousal when needed. Progressive muscle relaxation training involves the alternate tensing and relaxing of major muscle groups, with gradual elimination of the contractions in the practice of passive relaxation. The relaxation sequence starts at the extremities and moves
progressively up muscle groups of the arms and legs and into the body shoulders and head. As muscle groups are tensed one at a time, the client is trained to focus upon the increase in the sense of relaxation in each muscle area when the tensed muscles are released (Deffenbacher & Suinn, 1988). Students can practice this in the guided setting of the classroom as well as at home where they can be in a comfortable position and free from distractions. Cued controlled relaxation is designed to enable the student to achieve relaxation and decrease anxiety and response to a cue word (Paul, 1966). This is accomplished by training the student in relaxation techniques followed by a period of a relaxed state with a cue word such as “calm”. With regular practice of relaxation and cue word association, the development of the condition of relaxation response will become associated with that word. Although cued controlled relaxation training can produce the relaxation response during stressful settings, it takes considerable training before it become automatic.

In this study by Chang-Liang and Denney (1976), high and low test anxious students were treated with one of four procedures: applied relaxation, systematic desensitization, relaxation only or no treatment. Test anxiety was measured using three measures of test anxiety. The results indicated a significant reduction in anxiety in the applied relaxation group, however there were no significant differences between applied relaxation and systematic desensitization. Some studies report that cued controlled relaxation leads to a reduction in test anxiety (Denney, 1980), while others do not (Marchetti, McGlynn & Patterson, 1977).

Systematic desensitization is a type of behavioral therapy used in the field of psychology to help effectively overcome phobias and other anxiety disorders. To begin
the process of systematic desensitization, one must first be taught relaxation skills in
order to extinguish fear and anxiety responses to specific phobias. Once the individual
has been taught these skills, he or she must use them to react towards and overcome
situations in an established hierarchy of fears. When the student is deeply relaxed,
evaluative stimuli are presented in hierarchical order beginning with non-threatening or
only slightly threatening items and then advancing to those that are more personally
threatening. The goal of this process is to have the individual learn to cope and overcome
the fear at each step of the hierarchy, which will lead to overcoming the final fear in the
hierarchy. Systematic desensitization is sometimes called graduated exposure therapy.

In a study that compared high school students who received systematic
desensitization therapy and those who received no therapy, treatment was found to
produce a significant reduction in test anxiety scores (Laxer, Quarter, Kooman & Walker,
1969). Despite decreases in test anxiety, performance improvement was not significant
until grade 13. In another study, the test anxiety scores of college students were reduced
from about 0.5 to 1 standard deviation (Deffenchacher & Suinn, 1988). Furthermore,
follow-ups a year or more later demonstrated that desensitization effects were maintained
over extended periods.

Russell, Wise and Stratoudakist (1976) compared systematic desensitization to
relaxation therapies. These authors examined systematic desensitization, relaxation
therapy and control groups using three measures of test anxiety. The results found a
significant improvement in test anxiety on all three measures of test anxiety. Relaxation
therapy was found produce clinically significant improvement into of the three self-report
measures of test anxiety when compared to the control group. Although it appeared that
systematic desensitization and relaxation therapy techniques improved symptoms of test anxiety, both groups did not show significant improvements in test performance. Russell and Lent (1982) found that systematic desensitization techniques were shown to produce clinically significant reductions in test anxiety. Relaxation therapy was found to have no clinical effect on either of these measures.

Anxiety management training teaches highly anxious students to recognize and identify the assessment related cognitive and physical symptoms that signal the onset of anxiety and to use these cues for initiating adaptive coping responses to counteract them (Deffenbacher & Suinn, 1988). This treatment begins by presenting students with the rationale and reason for the training and by developing a relaxation scene, introducing relaxation training and some at home activities. Once the student has mastered some of the deep relaxation techniques, the student can then visualize an anxiety provoking evaluation. He or she is guided through his or her cognitive and physical responses to the memories of the evaluation. Upon recognizing arousal symptoms, the student can then employ the relaxation techniques thus terminating the arousal and regaining a relaxed state. This guided rehearsal aims at helping students discriminate cues of tension and anxiety, to detect these cues early in their development and to use these cues and signals to begin actively applying newly learned coping skills (Denney, 1980). Research indicates that anxiety management training is effective in the reduction of test anxiety and produces decreases in levels of test anxiety over time (Suinn, 1990). This technique, although primarily relaxation based, begins to employ cognitive awareness of anxiety in order to employ strategies to assist in anxiety management.
**Cognitive approaches.** Cognitive therapy is a generic term that refers to a wide array of therapeutic approaches directed towards changing the worry and irrational thought patterns of test anxious clients. The primary assumption shared by cognitive models of test anxiety is that these cognitive processes mediate the individual’s emotional and behavioral responses to evaluative situations. Cognitive therapy modifies these negative emotional reactions of test anxious students to evaluative situations by redirecting and reshaping the faulty premises, assumptions and negative attitudes that undermine maladaptive cognitions of test anxious students.

The theory behind cognitive attentional training is that high test anxious students can be taught to attend to task relevant stimuli and avoid thinking about other things such as task irrelevant thoughts and preoccupations and consequently enhance their cognitive task performance (Wine, 1980). Attentional training teaches students to absorb themselves in the task at hand and to avoid other thoughts, preoccupations or negative thought patterns. (Turk & I.G. Sarason, 1983). Students are taught through modeling how to focus on task relevant variables through attention directing self-instructions. When conflicting or distracting thoughts occur, the students are instructed to redirect their thoughts to solving the problem at hand. On tasks statements such as, “I will think about that later” as well as positive self-evaluation statements such as, “you can do this” serve to mediate the direction of attention (Kirkland & Hollandsworth, 1980).

Research indicates that cognitive attentional training is beneficial in the performance of high test anxious students (Mueller, 1978). Further, this research by Mueller suggests that cognitive attentional training not only increases the performance of high test anxious students, but also has beneficial performance effects on non-test
anxious students as well. Wise and Haynes (1983) found that cognitive attentional training decreased test anxiety as well as increased performance during assessment. Further, these researchers found that the treatment effects were still evident eight months after the training.

Rational emotive therapy teaches test anxious clients to recognize irrational belief systems that are primarily responsible for their anxiety reactions during testing situations (Zeider, 1998). The goal of this therapy is to teach students how to challenge and dispute their own irrational thoughts and false assumptions so that they can replace them with more realistic ones (Fletcher & Spielberger, 1995). This therapy encourages test anxious students to identify irrational or disruptive thoughts, identify the situations or environments in which these thoughts occur, and to identify the negative consequences of these thoughts. The student is then taught how to challenge, question or dispute these irrational beliefs and to disrupt the self-defeating thinking patterns that are common among test anxious students. Research has shown that rational emotive therapy may be effective in reducing anxiety, however, it has not been shown to produce a significant impact upon test performance (Fletcher & Spielberger, 1995; Wessel & Mersch, 1994).

Systematic rational restructuring helps test anxious students to become aware of their own task irrelevant thoughts as they occur during examinations, to stop such thoughts, and to substitute positive self-statements to redirect their attention to the task at hand (Denney, 1980). Using this type of therapy, the student imagines a testing situation and identifies and brainstorms negative thoughts, perceptions and emotions surrounding the testing situation. The test anxious student is taught to produce three types of task relative cognitions: self-instructions, coping self-statements and self-reinforcing
statements. In addition, students are instructed to focus on task relevant behaviors such as working on the test itself and employing problem-solving strategies that are not compatible with the negative emotions, cognitions and perceptions.

Rational emotive therapy and systematic rational restructuring are similar procedures, however in systematic rational restructuring, the therapist engages the student by testing the rationality of his or her negative thoughts and by authenticating observation, validating assumptions and taking an objective perspective. In rational emotive therapy, the therapist challenges the student's false beliefs and relies heavily upon formal analysis of the rationality of these beliefs. Systematic rational restructuring places a greater emphasis on replacing negative self-statements with positive self-statements.

In an examination of systematic rational restructuring efficacy, Holroyd (1976) compared test anxious students who received systematic rational restructuring intervention to a group who received systematic desensitization as well as a control group. The systematic rational restructuring students were made aware of distracting and anxiety-engendering thoughts both prior to and during test-taking situations. They were then trained to produce incompatible statements that were designed to facilitate attention to task. The results found that there was a significant increase in grade-point average as well as a significant reduction in test anxiety amongst the group that received systematic rational restructuring. This finding was corroborated by Goldfried, Linenan and Smith in 1978 who found rational restructuring produced a clinically significant reduction in test anxiety when compared to a control group and the group that received prolonged exposure to examination situations.
In a literature review conducted by Denney (1980), it was concluded that systematic rational restructuring resulted in reductions in self-reports of debilitating test anxiety. In this same meta-analysis, Denney found that resulting improvements in cognitive performance were less consistent. This conclusion that systematic rational restructuring helps decrease feelings of anxiety, however, does not improve cognitive performance during exams situations has also been supported by Hembree (1988) and Vagg and Papsdorf (1995).

The transactional process model suggests that test anxiety treatment should simultaneously focus on emotional, cognitive and behavioral strategies. In a study by Dendato and Diener (1986), test anxious students were divided among four condition groups: relaxation/cognitive therapy, study skills, relaxation therapy/cognitive therapy/study skills combined and control who received no intervention. The results found that students who received relaxation/cognitive therapy experienced a significant reduction in test anxiety, however, their academic performance remained the same. The students in the control group and study skills group did not experience significant changes in their test anxiety symptoms or academic performance. The students who receive emotion-based therapy (relaxation therapy), cognitive therapy (rational emotive therapy) and behavioral therapy (study skills) experienced a clinically significant decrease in their test anxiety symptoms as well as a significant increase in their academic performance.

Teacher ability to generate appropriate intervention. The ability of teachers to generate appropriate interventions for students who experience test anxiety has not been studied. However, it was found that teachers were able to identify many appropriate
accommodations for test anxiety when they were provided with a list to select from (Morris, 2010). This study also allowed teachers the opportunity to write down a strategy that was not listed. It was found that many of the additional accommodations listed by teachers were appropriate. This research implies that when teachers are given diagnostic information about a student, they are able to independently generate accommodations and instructional modifications that are appropriate. This study, however, only provided descriptive statistics and studied only twenty subjects.

**Teacher Identification of Anxiety in Students**

Test anxiety presents with an array of symptoms that become apparent when students are subjected to an examination or evaluative process. These symptoms may be physical, cognitive, behavioral or affective in nature. Each student will present with symptoms in their own individual way.

Test anxiety is considered a type of state anxiety that is triggered by the perceived threat of an examination situation (Spielberger, Gorsuch and Lushene, 1970). Physical symptoms may include physical signs of nervousness such as sweaty palms and shaky hands. The student may have trouble sleeping, have “butterflies” or feel nauseous before an exam. Affective symptoms may present to others in the form of complaints about stress, worry, or fear about an upcoming test. Cognitive signs of test anxiety include difficulty concentrating, impaired memory, lack of confidence and depreciating self-statements (Deffenbacher, 1980).

Although the ability of teachers to identify test anxiety has not been studied, Argulewicz and Miller (1985) explored the relationship between teachers’ perceptions of their students’ anxiety and student reported anxiety. Students in five first-grade classes
participated in the study and were administered two self-report measures of anxiety. The results indicated clinically significant coefficients for two of the five classrooms studied. Based on teacher observation alone, many students were not identified by their teachers as having problems with anxiety. Corroborating this, Stanger and Lewis (1993) reported that concordance rates involving teacher reports of internalizing problems on the Child Behavior Check List (CBCL) were low (teacher–child = −0.08) compared to concordance between children and their parents (child–mother = 0.30).

Other research indicates that teachers are able to accurately identify anxiety and anxiety related behaviors in the classroom. In study by Layne, Bernstein and March (2006), the Multidimensional Anxiety Scale for Children (MASC) was completed by 453 second through fifth grade students. Their teachers nominated the three most anxious students in their classrooms based on observations. It was found that children identified by their teachers as anxious had significantly higher levels of anxiety. Messman and Koot (2000) compared the Teacher Report Form and Parent Report Form of the Child CBCL with child-reported anxiety on the State Trait Anxiety Inventory for Children. The findings indicated that teachers (teacher–child = 0.30) were more aware of children’s internalizing problems than were parents. This research has not produced consistent results and it is not clear whether teachers can identify anxiety as the cause of behavioral symptoms observed in the classroom setting. While it is believed that teachers are not skilled at detecting anxiety in their classrooms (Frick, Silverthorn & Evans, 1994; Loeber, Green & Lahey, 1990), consistent research supporting such beliefs is lacking.

Although sufficient research is not available about teacher ability to generate appropriate interventions and instructional modification for student who experience test
anxiety, similar research is available for other disorders. Cunningham and Wodrich (2006) studied the ability of teachers to produce appropriate interventions for students with type I diabetes mellitus (T1DM). Teachers were provided with one of three levels of information; student behavior, student behavior and a diagnosis of T1DM, and student behavior, a diagnosis of T1DM and educational implications. It was found that teachers were better able to generate more appropriate interventions when they were provided with a description of student behavior along with a diagnosis when compared to the teachers who were only provided with a description of student behaviors. When provided with a description of student behaviors, a diagnosis and implications of the diagnosis in the classroom setting, teachers were able to produce similar accommodations and interventions as teachers who were given only a description of student behavior and a diagnosis.

It is the intention in this study to use a construct similar to that adopted by Cunningham and Wodrich (2006) to determine whether teachers given a diagnosis of test anxiety for a student and in some cases given additional symptomology about the educational implications of this diagnosis are better able to provide appropriate accommodations and interventions for the student. A wide range of interventions have been shown in research to reduce or eliminate test anxiety. Evidence-based interventions that are peer reviewed and compared with a control group that show a significant improvement in test anxiety or anxiety related behaviors will provide a basis for evaluating the appropriateness of the interventions suggested by the subjects in this study. Mental health referrals will also be examined.
Chapter III

Methodology

As presented in the previous chapters, test anxiety has been identified and studied for the last half century. Various instruments have been developed to measure test anxiety and interventions and instructional modifications have been researched to determine whether test anxiety symptoms and behaviors are reduced as a result of these interventions. There are, however, no studies of the ability of teachers to identify test anxiety and to provide appropriate research based intervention and behavioral techniques for students that experience these problems in the classroom setting.

Participants. A total of 130 educators participated in the study. Special education teachers and guidance counselors were eliminated from the data set due to the assumption that they have received training specific to anxiety disorders and have had direct experience working with anxious students in the school setting. Further, general education teachers who possessed an advanced degree (Masters or Ph.D.) with their field of study in special education, counseling or psychology were eliminated.

A total of 99 general teachers were presented with case information and completed the attached survey (N = 99). Out of the 99, 30.3% received only the case study (n = 30), 33.3% received the case study and a diagnosis (n = 33), and 36.4% received the case study, diagnosis, and additional information (n = 36). Out of the total sample, 90.9% were female (n = 90) and 9.1% were male (n = 9). The sample was 91.9% Caucasian (n = 91), with 2% reporting African-American (n = 2), 1% reporting Asian-American (n = 1), 3% reporting American Indian/Alaska Native (n = 3), and 1% reporting Latino (n = 1). See Table 1 for these demographic frequencies.
Table 1

*Demographic Frequency Table*

<table>
<thead>
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<tbody>
<tr>
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<tr>
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<tr>
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<tr>
<td>American Indian</td>
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<td>3</td>
</tr>
<tr>
<td>Latino</td>
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The number of years the teachers in the sample taught ranged from 1 to 32 ($M = 12.88$, $SD = 7.05$). 35.1% of the sample taught between 1 and 9 years ($n = 34$), 47.4% taught between 10 and 19 years ($n = 46$), and 17.5% taught between 20 and 32 years ($n = 17$; see Table 2 for a frequency distribution).

Table 2

*Tenure Frequency Table*

<table>
<thead>
<tr>
<th>Tenure</th>
<th>Frequency</th>
<th>Percent</th>
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</tr>
<tr>
<td>10-19 years</td>
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<td>47.5</td>
</tr>
<tr>
<td>20+ years</td>
<td>17</td>
<td>17.5</td>
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**Study Materials and Measures**

Participants were asked to complete a demographic questionnaire which included information about their current teaching positions, level of training and areas of teaching specialty. This information was used to determine whether the data collected from each participant would be included in this study based on the exclusionary criteria set above. The participants in this research were then randomly presented with one of three levels of information. Level I information included a case study depicting a student with test anxiety symptoms and behaviors in the classroom setting. Level II information included a
case study depicting a student with test anxiety symptoms and behaviors in the classroom setting and a test anxiety diagnosis. Finally, Level III information included a case study depicting a student with test anxiety symptoms and behaviors in the classroom setting, a test anxiety diagnosis and further information about how test anxiety might affect students in the school setting. These three levels of information were the independent variable in this study.

**Procedures**

In order to recruit teachers to participate, elementary school principals and district school psychologists were offered a free teacher presentation titled, Improving Test Scores: Strategies for Regular and Special Education Students. Initial recruitment began with a letter or phone contact offering the free presentation along with an overview of the research goals and the level of teacher participation required for data collection. The initial contact was followed up approximately 10-days later with a phone call. The phone call served to provide any additional information that might be needed and to determine school participation.

The presentation and data collection for this research was conducted during regularly scheduled staff meetings or in-service meetings at each of the participating elementary schools. At the onset of the data collection, teachers were randomly given one of three packets of information. An explanation of the research, voluntary participation and risks and benefits of participation were explained and teachers had time to read the overview of the study and informed consent documents on the first page of the packet (Appendix B). Teachers who chose to participate and signed the informed consent page continued to a demographic questionnaire (Appendix C). Teachers then proceeded to the
following page of the packet that included a case study of a student experiencing symptoms and behaviors associated with test anxiety (Appendix D). Below the case study, teachers were provided space to report what they believe the underlying problem of the student depicted in the case study might be. The teachers were then instructed to turn the page and read any supplementary information that might be provided on the following page, depending on the level of information their packet contained. The packets distributed to teachers were identical for all participants, differing only in regards to the three levels of the independent variable. Each participant received only one test anxiety information level, creating a between subjects design. The teachers were then asked to generate instructional modifications and interventions for the student depicted in the case study, taking into consideration any additional information that might have been provided. Finally, participants were given the opportunity to leave their contact information if they wanted to obtain the results of this study upon its completion.

**Research Design**

The research design of this study is modeled around Cunningham and Wodrich’s (2006) study in which teachers were provided with one of three levels of information about a student with Type I diabetes mellitus and were asked to generate appropriate instructional modifications for the student based on the level of information they were provided with. This study used a sample of 90 teachers. A GPower analysis indicated a sample size of 84 teachers would be required to generate a large effect size at an alpha of 0.05 and a power of 0.9. In the current study, a sample of 99 teachers was used.

**Research question #1.** The first research question determined whether teachers were able to identify anxiety as the underlying problem based on a case study of a student
exhibiting symptoms and behaviors of test anxiety All participating teachers were provided with a case study depicting a student with test anxiety symptoms and behaviors in the classroom setting and were asked to identify what they believed the underlying problem of the student might be. Answers that identified anxiety or synonyms for anxiety as stated in the Merriam-Webster Dictionary and Diagnostic and Statistical Manual of Mental Disorders - Revised - 4th Edition were considered correct (Anxiety, 2011; American Psychiatric Association, 2000; Appendix E). The final result of this analysis is presented as a descriptive statistic in terms of a percentage of teachers who are able to identify anxiety as the underlying problem of the student depicted in the case study. Past research has indicated that teacher perceptions of anxiety based on classroom observation of students is poor (Argulewicz & Miller, 1985) while other studies have shown that teachers are better able to identify an anxiety disorder (Messman & Koot, 2000).

Research question #2.

The second research question determined whether teachers were able to generate a greater total number of instructional recommendations, interventions and instructional modifications for students with test anxiety (regardless of quality) when presented with increasing amounts of disorder information; (a) a case that described a child with test anxiety related behavior but no diagnosis given; (b) a case that described a child with test anxiety related behavior with diagnosis of test anxiety; and (c) a case that described a child with test anxiety related behavior with an anxiety diagnosis, and additional information about test anxiety. The total number of teacher generated interventions and instructional modifications were counted for each subject.
Due to the subjective nature of this data, an inter-rater examination was conducted. The data collected was submitted to an independent school psychologist to rate. The results were compared with those of the principal investigator and discrepant items were then reviewed by a third, highly trained school psychologist. The discrepant items were discussed and a consensus was reached between the principal and secondary investigator of this study.

**Research question #3.** This research question determined whether teachers were able to generate a greater quantity of anxiety specific, research based interventions and instructional modifications for students with test anxiety when presented with increasing amounts of disorder information; (a) a case that described a child with test anxiety related behavior but no diagnosis given; (b) a case that described a child with test anxiety related behavior with diagnosis of test anxiety; and (c) a case that described a child with test anxiety related behavior, with an anxiety diagnosis, and information about test anxiety.

This research question was examined by individually analyzing the number of research based, anxiety specific interventions generated by teachers, the number of research based, behavioral techniques that are likely to result in improvement of anxiety symptomology generated by teachers, and a combination of anxiety specific interventions, research based behavioral techniques, and mental health referrals made by teachers. This strategy of analysis allowed a detailed examination of the type of recommendations made by teachers, along with the overall number of quality interventions and instructional modifications generated.

Research based studies on test anxiety intervention were obtained using a computerized search of: Educational Resources Information Center (ERIC; 1959–2011),
PsycINFO (1930–2012), and psycARTICLES (1936-2011) databases using the keywords test anxiety + intervention, test anxiety + cognitive, Test anxiety + accommodations, test anxiety + therapy, test anxiety + treatment and test anxiety + counseling. Studies that specifically examined a test anxiety and provided a control as means of comparison were examined. Of those studies identified, interventions and instructional modifications that produced a clinically significant reduction in test anxiety or a clinically significant improvement of academic performance were considered “research based” for the purpose of this study. A list of research based interventions and instructional modifications that met these criteria are specified in Appendix F. Again, given the subjective nature of the data collected, number of anxiety related, research-based interventions generated by teachers was subjected to an inter rater examination identical to that used for research question # 2.

Teacher generated behavioral techniques that have been shown in research to decrease anxiety related behaviors and symptoms that interfere with test performance were also examined and tallied. Due to the subjective nature of this data, an inter-rater examination was again conducted using the same methodology employed with research questions #2.

As part of this research design, a referral for mental health services (guidance counselor, school psychologist or counseling in the community setting) was considered an appropriate recommendation that would assist a student who experiences test anxiety. A final frequency count of the total number of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and
mental health referrals) was calculated. This produced a combined total of teacher recommendations that would reasonably assist a student who experiences test anxiety.

**Research question #4.** This research also determined whether the frequency of referral to mental health services (school psychologist, guidance counselor, referral to counseling in the community) would increase when teachers were presented with increasing amounts of disorder information; (a) a case that described a child with test anxiety related behavior but no diagnosis given; (b) a case that described a child with anxiety related behavior with diagnosis of test anxiety; and (c) a case that described a child with anxiety related behavior with an test anxiety diagnosis, and information about test anxiety. Any intervention that recommended a referral to mental health services was considered acceptable for the purpose of this study. The determination of whether a mental health referral was recommended by teacher was subjected to inter rater examination and consensus was made on discrepant items.

The primary purpose of this study was to examine the effect of providing teachers with varying levels of information about test anxiety on their ability to generate appropriate instructional modifications, interventions, behavioral techniques and mental health referral. This study sought to find out whether providing teachers with mental health diagnostic information and professional development training influenced the quantity of well-targeted classroom interventions, instructional modifications and referrals.

**Analysis**

The first research question was to examine teacher ability to identify anxiety as the root of student performance problems based on a case study depicting a student’s
symptoms and behaviors related to test anxiety. A nonparametric descriptive analysis was used to examine the participant’s ability to identify the underlying problem based only on the case study.

The independent variable in this study is the amount and nature of information provided to each participant about the hypothetical student. Teachers were randomly distributed one of three different levels of information. Teachers were then asked to create classroom instructional modifications or interventions for the hypothetical student based on the level of information they were provided with.

The instructional modifications and interventions teachers generated provided the dependent variables for this study. The first dependent variable of this study examined the total number of teacher generated instructional modifications and interventions recommended by each teacher. The second dependent variable examined the quantity of anxiety specific, research based interventions generated by each teacher. The third dependent variable examined the quantity of research based behavioral techniques that were likely to assist with anxiety related symptomology (as determined by highly qualified school psychologists) generated by each teacher. Finally, the fourth dependent variable examined the total number of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals) generated by each teacher.

In the one-way ANOVA, three levels of the independent variable were compared to four dependent variables: Total number of teacher recommendations, anxiety specific, research based interventions, research based behavioral techniques and the total number
of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals).

The ANOVA F test evaluates whether the group means on the dependent variable are significantly different from each other. That is, an overall analysis-of-variance test is conducted to assess whether means on a dependent variable are significantly different among the groups. ANOVA requires that the observations in the data must be independent, that the distribution of the dependent variable must be normal and that there must be originating of variance between groups. In this study, the groups were independent of each other. The Schapiro Wilkes statistic was used to determine whether the assumption of her normality had been violated. The Schapiro Wilkes statistic is a very conservative test attempts to reject the null hypothesis of normality for even small deviations. Homogeneity of variance was tested using a graphical representation of the distribution as well as Levine’s statistic. Levine’s test uses the level of significance set a priori for the ANOVA (α = .05) to test the assumption of homogeneity of variance.

Due to violations in the assumptions of homogeneity and normality, two types of analysis were conducted to determine between group differences. Analysis of variance (ANOVA) and a Kruskal-Wallis test to determine whether there were differences in the number of recommendations made by teachers by the level of information given. The Kruskal-Wallis test can be followed up by a pairwise Mann-Whitney test if found to be significant. If ANOVA is found be significant, a Tukey HSD test will examined pairwise contrasts while controlling for the fact that multiple tests are running simultaneously. This will determine precisely where the differences lay between groups.
This research also examined whether a relationship existed between a teacher recommending a mental health referral and the level of information they were provided with. The chi-square test of independence was used to determine whether there was a significant association between two nominal level variables. Significance in this test is dependent on both the chi-square value and the degrees of freedom in the cross tabulation. This test will determine whether the two variables are dependent or related to one another.

**Threats to Internal and External Validity**

An experiment is internally valid to the extent that it shows a cause-effect relationship between the independent and dependent variables. In this study, elementary general education teachers were asked to read a case study and supplemental information and create instructional modifications and interventions based on that information. Because there was only one independent variable, there were no groups to compare with each other. Special education teachers and teachers who received specialized training through post-graduate programs in counseling or special education were eliminated from the data in attempt to produce a homogeneous group of teachers who had only basic knowledge of test anxiety symptoms and intervention techniques. Teachers were randomly distributed one of three levels of information; therefore, differences between the different levels of information should only be due to the independent variable.

During the course of this study, teachers were informed that they could withdraw their consent at any time and were provided contact information if they wished to do so. There were no teachers who withdrew their consent. Further, all teachers who consented to the study completed the entire package presented to them. There were no incomplete
packages. It is noted that two teachers failed to complete the years of teaching service item on the demographic questionnaire.

**External Validity**

There are three major threats to external validity; (a) people, (b) places, and (c) times. In this study, general education elementary school teachers in Western Pennsylvania were the subjects. The findings of this research cannot be generalized to the general population of the United States, but only to teachers in the Western Pennsylvania region. Because the school districts that participated in this study are located in suburban areas, the findings are not generalizable to urban schools in the city of Pittsburgh. Teachers who participated in the study were approached during regularly scheduled school staff meetings at their schools. It is not believed that these variables affect the outcomes of this research.
Chapter IV

Plan of Analysis

The series of research questions proposed can be broken into three broad categories: Those dealing with leveled data that ask questions about the nature of the relationship between two ratio or interval level variables, those dealing with nominal data that ask questions about whether two nominal variables are independent or related, and those using scale or count data that ask questions about whether there are differences depending on the level of information presented. These research questions and their accompanying null hypotheses are reviewed below along with a description of the analyses conducted to test these questions.

The first category of research questions asked whether there were differences on various outcome variables depending on the level of information presented. Two types of analyses were conducted on these data, ANOVA and a Kruskal-Wallis test. The first research question asked whether there was a difference between levels of information given in total recommendations made. The second asked whether there was a difference between levels of information given in the number of research-based interventions. The third asked whether there was a difference between levels of information given in behavior based techniques, and the last asked if there was a difference between levels on the total number of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals).

Analysis of variance (ANOVA) and Tukey’s post-hoc tests (if appropriate) were first conducted to test for these differences. ANOVA requires some assumptions about the data: the observations in the data must be independent, the distribution of the
dependent variable must be normal, and there must be homogeneity of variance between groups. ANOVA tests for mean differences on a dependent variable between levels of the independent variable. It tests the null hypothesis that there are no differences between levels with an omnibus F-test. If the F test is statistically significant (i.e. yields a p-value less than .05) one can conclude that there are differences between at least two of the levels. ANOVA, on its own, does not specifically address where those differences are. Post-hoc tests are therefore utilized to identify these differences if the overall ANOVA is significant. The present series of analyses uses Tukey’s HSD test, which tests all pairwise contrasts while controlling for the fact that multiple tests are occurring simultaneously (i.e. it controls for the fact that doing more tests means you are more likely to eventually find one test that is significant just by chance).

A second series of analyses, the Kruskal-Wallis test, were conducted because the assumptions of homogeneity and normality were violated in the data. While ANOVA is robust to violations of these assumptions, the Kruskal-Wallis test is more appropriate for contexts when the dependent variable is ordinal rather than interval. It is a non-parametric test (and thus not subject to the distributional assumptions) that provides a chi-square value testing the null hypothesis that there are no differences between levels. A statistically significant chi-square value thus indicates that there are differences between levels. The Kruskal-Wallis is thus similar to the ANOVA in that it is an omnibus test, informing that there is a difference but not specifying where. A significant Kruskal-Wallis test can be followed up by pairwise Mann-Whitney tests that employ a Bonferroni adjustment for the presence of multiple tests. The final research question asked whether
two nominal level variables were related by asking whether teachers who are provided with more information are more likely to make a mental health referral.

This research question was tested using the chi-square test of independence. The chi-square test of independence tests whether there is a significant association between two nominal level variables. A chi-square statistic is presented, along with a test of statistical significance. The significance is dependent on both the chi-square value and the degrees of freedom (number of rows and cells) in the cross-tabulation. The null hypothesis is that the two variables are independent, or unrelated to one another. Therefore, a rejection of the null hypothesis indicates that additional information is related to whether a mental health referral is made or whether anxiety is identified, respectively. Additionally, a percentage is presented indicating the percent of teachers who simply able to identify anxiety as the root of the student’s difficulties.

The final exploratory analysis used the interval level data and asked questions regarding the nature of the relationship between two variables. The relationship between tenure and the total number of recommendations made, the number of interventions, the number of behavioral techniques and the total number of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals) were explored. The null hypothesis for these questions was that there is no relationship between each of these pairs of variables.

A Pearson product moment correlation was used to test these four research questions. Thus, the null hypothesis is that the correlation between variables is zero. Pearson’s $r$, a measure of association between two interval-level variables, can be used to determine if there is enough evidence to reject the null hypothesis. Pearson’s $r$ ranges
from -1, representing a perfect negative correlation, to +1, representing a perfect negative correlation, with zero representing no correlation. Convention (Cohen, 1988) states that a correlation of .1 is considered weak, a correlation of .3 is considered a medium relationship, and a correlation of .5 or greater is considered strong. Additionally, a significance test is presented, with a significant correlation indicating that it is possible to reject the null hypothesis of no association. A p-value of .05 or less in a two-tailed test will be used as the cut-off for declaring significance.

**Summary of dependent variables**

There were several dependent variables included in the survey that measured the participant’s reactions to the particular case study presented. Specifically, the total number of recommendations made (regardless of quality), the number of research-based interventions identified to alleviate anxiety, the number of behavioral technique based recommendations, and whether a mental health services reference was made. Additionally, the combination of the number of anxiety specific, research based interventions, behavior based recommendations, educational recommendations, and mental health referrals were measured.

The total number of suggestions ranged from two to eleven. 8.1% of participants made two recommendations \((n = 8)\), 27.3% of participants made three recommendations \((n = 27)\), 21.2% made four recommendations \((n = 21)\), 18.2% made five recommendations \((n = 18)\), 7.1% made six recommendations \((n = 7)\), 7.1% made seven recommendations \((n = 7)\), 5.1% made eight recommendations \((n = 5)\), 2% made nine recommendations \((n = 2)\), 3% made ten recommendations \((n = 3)\), and 1% made eleven recommendations \((n = 1)\). A summary of this data is presented in Table 3.
Table 3

<table>
<thead>
<tr>
<th># of recommendations</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>8</td>
<td>8.1</td>
</tr>
<tr>
<td>3</td>
<td>27</td>
<td>27.3</td>
</tr>
<tr>
<td>4</td>
<td>21</td>
<td>21.2</td>
</tr>
<tr>
<td>5</td>
<td>18</td>
<td>18.2</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>7.1</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>5.1</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

The total number of anxiety related research based interventions suggested ranged from zero to three. 62.6% of participants suggested zero interventions \((n = 62)\), 26.3% of participants suggested one intervention \((n = 26)\), 8.1% suggested two interventions \((n = 8)\), and 3% suggested three interventions \((n = 3)\). The total number of behavior-based techniques ranged from zero to two. 29.3% reported zero behavior-based techniques \((n = 29)\), 51.5% reported one \((n = 51)\), and 19.2% rated two \((n = 19)\). The number of combined referrals (research based, behavioral technique, and mental health referral) ranged from zero to five. 18.2% reported zero \((n = 18)\), 34.3% reported one \((n = 34)\), 34.3% reported two \((n = 34)\), 8.1% reported three \((n = 8)\), 2% reported four \((n = 4)\), and 3% reported five \((n = 3)\). 9.1% of the sample reported that they referred a student for mental health services \((n = 9)\) while 90.9% reported that they did not \((n = 90)\). Further, the entire sample did not report a school psychologist referral \((n = 99)\). Finally, 92.9% of the sample identified anxiety as the root of the student’s problem \((n = 92)\) whereas 7.1% did not \((n = 7)\). A summary of these dependent variables can be found in Table 4.

Table 4
Summary of Dependent Variable Frequencies

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety identification</td>
<td>92</td>
<td>92.9</td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>7.1</td>
</tr>
<tr>
<td>Anxiety related research - based interventions</td>
<td>62</td>
<td>62.6</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>26.3</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>8.1</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Behavior-based techniques</td>
<td>29</td>
<td>28.3</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>51.5</td>
</tr>
<tr>
<td>1</td>
<td>19</td>
<td>19.2</td>
</tr>
<tr>
<td>Combination</td>
<td>18</td>
<td>18.2</td>
</tr>
<tr>
<td>0</td>
<td>34</td>
<td>34.3</td>
</tr>
<tr>
<td>1</td>
<td>34</td>
<td>34.3</td>
</tr>
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<td>2</td>
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<tr>
<td>4</td>
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<tr>
<td>Mental health referral</td>
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<tr>
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<td>90.9</td>
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<tr>
<td>School Psychologist referral</td>
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<td>100</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No</td>
<td>99</td>
<td>100</td>
</tr>
</tbody>
</table>

Results

**Non-parametric, descriptive analysis.** The first research question posed in this study is whether teachers were able to identify anxiety as the root of the student’s issue based on only a case study depicting a student with anxiety related behavioral, physiological and emotional symptomology. It was revealed that the teachers were predominantly able to identify anxiety as the issue. 92.9% of participants identified anxiety, or some other synonym, as the root of the student’s issues.

**Testing relationships between variables.** Research question #4 asked whether referral to mental health services (school psychologist, guidance counselor, referral to counseling in the community) increased when teachers were presented with increasing amounts of disorder information. A chi-square test of independence was conducted to see
if the level of information variable was independent of the mental health referral variable. This chi-square was non-significant, $\chi^2(2) = 3.58, N = 99, p = .167$. Thus, the level of information presented was statistically unrelated to whether or not a mental health referral was made.

**Testing for between-group (level) differences.** Additional research questions were put forth asking whether various outcome variables (total number of recommendations, quantity of anxiety specific, research based interventions, quantity of behavior-based techniques, and quantity of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals) differed depending on the level of information presented (e.g., a case study instead of a case study with a diagnosis). The descriptive statistics for these dependent variables are reported in Table 5. To test these questions, a series of one-way ANOVA analyses were conducted. Tests of the two statistical assumptions, normality and homogeneity of variance, are reported prior to each analysis. The third assumption, independence of observations, is met for all analyses due to the between-subjects design of the data collection.

Table 5

*Descriptive Statistics for Dependent Variables*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>99</td>
<td>4.66</td>
<td>2.051</td>
</tr>
<tr>
<td>Interventions</td>
<td>99</td>
<td>.52</td>
<td>.774</td>
</tr>
<tr>
<td>Behavior</td>
<td>99</td>
<td>.90</td>
<td>.692</td>
</tr>
<tr>
<td>Combined</td>
<td>99</td>
<td>1.51</td>
<td>1.13</td>
</tr>
</tbody>
</table>

*Total number of recommendations.* Research question #2 asked whether there were differences in the total number of recommendations (regardless of quality) made
depending on the amount of information given. A one-way ANOVA was conducted using level as the independent variable and total number of recommendations as the dependent variable. The assumption of normality was tested using the Shapiro-Wilk statistic. A statistically significant Shapiro-Wilk statistic indicates that the assumption of normality has been violated, though this is a very conservative test that tends to reject the null hypothesis of normality for even small deviations. For this analysis, the statistic was significant for the number of suggestions variable at the level of case study ($p = .037$), case study and diagnosis ($p = .002$), and case study, diagnosis, and additional information ($p < .001$). Thus, the assumption of normality was violated. A graphical representation of this distribution is presented in Figure 1, demonstrating that the distribution appears normal when examined visually. The homogeneity of variance was tested using Levine’s statistic, finding that there was significant heteroscedasticity, $F(2,96) = 1.86, p = .161$. Thus the assumption of equal variances was violated.
Despite the violation of assumptions for this test (and in the following ANOVA tests), the analysis was conducted and results were reported because the ANOVA F-test is robust to slight departures from both normality and homogeneity of variance. Thus, while these analyses violate the strictest definitions for the assumptions of parametric statistics, these deviations were deemed minimal and acceptable.

The ANOVA for this research question was significant, $F(2,96) = 4.06, p = .020$. The effect size statistic, the partial eta-squared, was .078. Thus, it is possible to reject the null that the mean number of recommendations did not differ between groups. Tukey’s post-hoc tests were conducted to determine precisely where the differences lay. These tests revealed a significant difference between merely receiving a case study ($M = 5.40, S.E. = .36$) and receiving a case study with a diagnosis ($M = 3.97, S.E. = .35$), $p = .015$. 

\[ \text{Figure 1. Distribution of the total number of recommendations made.} \]
There were no other significant differences between levels of information presented.

Thus, whether or not a teacher received a case study or a case study with a diagnosis led to a difference in the quantity of suggestions that they made. Table 6 presents the ANOVA table for this analysis.

As discussed above, a Kruskal-Wallis non-parametric test was also conducted due to the ordinal level of measurement in the dependent variable and the violations of parametric assumptions. This test also tests for differences in the number of recommendations made by level of information given. The Kruskal-Wallis test was significant, $\chi^2(\text{df} = 2) = 7.569$, $N = 99$, $p = .023$, indicating there are differences in the total number of recommendations made depending on the level of information received. This finding is consistent with the ANOVA, though it is limited by its lack of a post-hoc test to further explain the effect.

A Mann-Whitney U test was conducted to corroborate the Yukey’s post hoc finding that the group with a case study only produced a greater number of overall recommendations than the group that was given a case study and a diagnosis. The results of the test were in the expected direction and significant, $z = 2.571$, $p < .05$. Teachers with a case study only had an average rank of 38.6, while teachers with the case study and a diagnosis had an average rank of 26.8.

Table 6

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>Df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
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<td>2</td>
<td>16.08</td>
<td>4.06</td>
<td>.02</td>
</tr>
<tr>
<td>Error</td>
<td>380.17</td>
<td>96</td>
<td>3.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>412.32</td>
<td>98</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Anxiety specific, research based interventions. The third research question asked whether teachers were able to generate a greater number of anxiety specific, research based interventions and evidence based behavioral techniques for students with test anxiety when presented with increasing amounts of disorder information. A separate one-way ANOVA was conducted using level as the independent variable and number of anxiety specific research based interventions as the dependent variable. The assumption of normality was tested using the Shapiro-Wilk statistic. For this analysis, the statistic was significant for the number of anxiety specific research based interventions at the level of case study ($p < .001$), case study and diagnosis ($p < .001$), and case study, diagnosis, and additional information ($p < .001$). The assumption of normality was thus violated. The histogram with a normal curve is presented in Figure 2. A visual analysis shows that the data may deviate slightly from normal. Further, homogeneity of variance was tested using Levine’s statistic, finding that there was significant heteroscedasticity. $F(2,96) = 1.00$, $p = .371$ and thus a violation of this assumption.
The ANOVA was nonetheless conducted. The ANOVA found no significant differences, $F(2,96) = .742, p = .479$. The effect size statistic, the partial eta-squared, was .015. This finding indicates that there were no differences between levels of information given on the number of anxiety related research based interventions. Table 7 presents the ANOVA table for this analysis.

A Kruskal-Wallis non-parametric test was also conducted due to the ordinal level of measurement in the dependent variable and the violations of parametric assumptions. This test also tests for differences in the number of anxiety specific research based interventions by level of information given. The Kruskal-Wallis test was not significant, $\chi^2(2) = 1.535, N = 99, p = .646$, indicating there are no differences on interventions between levels of information given. This finding is consistent with the ANOVA, leading
to the conclusion that there are no differences on the number of interventions between levels.

Table 7

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>Df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
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<tr>
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<td>.447</td>
<td>.742</td>
<td>.479</td>
</tr>
<tr>
<td>Error</td>
<td>57.833</td>
<td>96</td>
<td>.602</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>58.727</td>
<td>98</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Research based behavioral techniques. The third research question asked whether there were differences in the number of behavior-based techniques due to the level of information presented. A one-way ANOVA was conducted using level as the independent variable and behavior-based techniques as the dependent variable. Prior to conducting this analysis tests of normality and homoscedasticity were completed. The assumption of normality was again tested using the Shapiro-Wilk statistic. The Shapiro-Wilk statistic was significant for the number of behavior-based techniques at the level of case study (p < .001), case study and diagnosis (p < .001), and case study, diagnosis, and additional information (p < .001). The assumption of normality was thus violated, though a visual examination of the distribution suggests that the distribution is close to normal (see Figure 3). The assumption of homoscedasticity, however, was not violated, as the Levine’s test was not significant, $F(2,96) = 2.627, p = .077$. The ANOVA was conducted despite the violation of normality. The one-way ANOVA was not significant, $F(2,96) = 1.13, p = .093$ (see Table 8). Thus, based on this ANOVA, one can conclude that there were no differences in the number of behavior based techniques due to the level of information a teacher received.
Figure 3. Distribution of the number of behavior-based techniques.

A Kruskal-Wallis non-parametric test was also conducted due to the ordinal level of measurement in the dependent variable and the violations of parametric assumptions. This test also tests for differences in the number of behavioral techniques across levels of information given. The Kruskal-Wallis test was not significant, $\chi^2(2) = 4.94$, $N = 99$, $p = .085$, indicating there are no differences in the number of behavioral techniques depending on the level of information received. This finding is consistent with the ANOVA.

Table 8

<table>
<thead>
<tr>
<th>Source</th>
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<th>Df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
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<tr>
<td>Level</td>
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<td>2.43</td>
<td>.093</td>
</tr>
<tr>
<td>Error</td>
<td>44.73</td>
<td>96</td>
<td>.466</td>
<td></td>
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</tr>
<tr>
<td>Corrected</td>
<td>46.99</td>
<td>98</td>
<td>.466</td>
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</table>
Reasonable recommendations. Further analysis of the data examined whether there were differences on the combination of research-based interventions, behavioral techniques, and mental health referrals due to the level of information received. The independent variable in this analysis is thus the level of information while the dependent variable is the combination variable. As before, the assumption of normality was statistically examined using the Shapiro-Wilk test. The results of this analysis suggest that the assumption of normality was violated. Specifically, the Shapiro-Wilk statistic was significant for combination variable at the level of case study ($p = .003$), case study and diagnosis ($p < .001$), and case study, diagnosis, and additional information ($p = .002$). A visual examination of the distribution in Figure 4 suggests that, while statistically significant, the deviation from normality is minimal. The homogeneity of variance assumption was also violated, per Levine’s test, $F(2,96) = 7.86$, $p = .001$. Despite these violations the one-way ANOVA was still conducted due to the robust nature of the test. The ANOVA was non-significant, $F(2,96) = 1.798$, $p = .171$. Thus, the ANOVA indicates that there were no differences on the combination variable due to level of information presented (see Table 9).
A final Kruskal-Wallis non-parametric test was also conducted due to the ordinal level of measurement in the dependent variable and the violations of parametric assumptions. This test also tests for differences in the total number of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals) across levels of information. The Kruskal-Wallis test was significant, $\chi^2(2,99) = 7.03$, $p = .030$, indicating there are differences in the total number of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals) made depending on the level of information received. In this instance, this finding is inconsistent with that found by the ANOVA analysis.
Table 9

**ANOVA for the number of reasonable recommendations**

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>Df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
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<td>2</td>
<td>.138</td>
<td>1.80</td>
<td>.171</td>
</tr>
<tr>
<td>Error</td>
<td>7.89</td>
<td>96</td>
<td>.082</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected</td>
<td>8.182</td>
<td>98</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A Mann-Whitney U test was conducted to evaluate the significant Kruskal-Wallis finding that some groups were able to generate a greater total number of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals) depending on the level of information they received. These findings suggested that teachers who were given a case study only were able to generate more anxiety related, research based interventions, evidence based behavioral techniques and mental health referrals compared to teachers who were given the case study and a diagnosis of test anxiety ($z=-2.43$, $p=.015$) with a case study only teachers having a mean rank of 38.03 and teachers with a case study and diagnosis having a mean rank of 27.3.

Further examination using the Mann-Whitney U test found that teachers who were given a case study, a diagnosis and additional information were able to produce a greater quantity of anxiety related, research based interventions, evidence based behavioral techniques and mental health referrals depending on the level of information they received when compared to the group that received the case study and a diagnosis ($z=-2.05$, $p=.041$) with a case study and diagnosis teachers having a mean rank of 29.7 and teachers with a case study, diagnosis and additional information having a mean rank of 39.1.
A final Mann-Whitney $U$ test found no significant relationship between teachers who received a case study only and the group of teachers who received a case study, diagnosis and additional information ($z=-.135$, $p=.893$).

**Summary of between group analysis.** Testing for between-group (level) differences examined whether various outcome variables (total number of recommendations, quantity of anxiety specific, research based interventions, quantity of behavior-based techniques, and quantity of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals) differed depending on the level of information presented. The analyses unequivocally show that there were differences on the total number of recommendations made. Specifically, individuals who only received a case study made more recommendations than individuals who received a case study and a diagnosis. Further, there are differences between levels of information on the combined variable (anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals), as evidenced by the Kruskal-Wallis test. Further analysis using the Mann Whitney U test found that teachers who received a case study were able to generate more reasonable recommendations when compared to teachers who received the case study and a diagnosis of test anxiety. Teachers who received a case study, diagnosis and additional symptomology information were able to generate more reasonable recommendations when compared to teachers who received the case study and a diagnosis of test anxiety. There was no relationship between the number of reasonable recommendations in teacher who received the case study only and teachers who received a case study, diagnosis and additional symptomology information.
**Teacher Tenure.** In addition to the research questions, Pearson correlation coefficients were calculated to determine the nature of the relationship between several of the variables above. There was no a significant relationship between the number of years taught (tenure) and the total number of recommendations made, $r = .074, p = .468$. The relationship between tenure and the number of anxiety related research based interventions was also non-significant, $r = -.031, p = .765$, as was the relationship between tenure and behavior based techniques, $r = .179, p = .079$. Finally, tenure and the combination of variables were not significantly related, $r = .132, p = .197$. This series of relationships demonstrates that the number of years spent as a teacher is statistically unrelated to the outcome variables described above.
Chapter V

The results of the statistical analyses presented in chapter four of this study are more fully described in this section. The findings are briefly summarized and the research questions are answered and compared to the hypotheses presented in chapter one. Significant and non-significant findings are compared to those in past research. In addition, limitations, recommendations for future research, and implications are presented.

Summary

The prevalence, measurement, and theories of test anxiety have been widely studied over the past four decades. The negative impact of test anxiety has been well documented in the literature with empirical studies demonstrating a negative relationship between test anxiety and performance on exams (Schwarzer, 1990; Seipp, 1991). The prevalence of test anxiety in school aged children has been increasing with 10% of school aged children in 1967 (Klondas), 25-30% in 1977 (Nottelmann & Hill) and 34-36% in a study of a Pittsburgh area school district fourteen years later (Beidel, 1991). Research into the intervention and management of test anxiety continues to develop, but is riddled with poor research design and inconclusive results. Teachers are in a unique position to assist students in managing their anxiety through research based intervention and behavioral techniques. This research examined whether teachers would be able to identify a test anxious student based on classroom behaviors. Further, the relationship between providing teachers with additional diagnostic and symptomology information and the quality and quantity of educational recommendations, interventions and instructional modifications, and referral for mental health services was examined.
This study is intended inform administrators and school psychologists who are in a position to provide student diagnostic information to teachers and have the ability to provide professional development opportunities and in-service training to teachers when they see fit. If such additional information was shown to assist teachers in the independent generation of anxiety specific interventions, instructional modifications and mental health referrals, teachers would be better able to serve the needs of test anxious students in their classroom. Giving teachers the tools needed (diagnosis and professional development opportunities) may promote the use of evidence-based intervention for students in their classrooms.

**Research Findings**

This study proposed to investigate the ability of teachers to identify test anxiety in a student depicted in a case study. Further, the ability of teachers to generate both quality and quantity of recommendations, interventions and instructional modifications when provided with increasing levels of information about the student was examined. Finally, the likelihood of a teacher referring the student for mental health services by a guidance counselor, school psychologist or in the community was compared with the amount of information with which they were presented.

The first research question assessed whether teachers would be able to identify anxiety as the underlying problem of the student depicted in a case study that described a child with anxiety-related behaviors and no diagnosis of test anxiety. It was hypothesized that teachers would predominantly be able to identify anxiety based on previous research that indicated that teachers are able to accurately identify anxious students in the class (Layne, Bernstein & March, 2006). This was measured using a nonparametric descriptive
analysis which found that 92.9% of participants were able to identify anxiety as the root of the student's issues. This finding is consistent with previous research. In this case study, teachers were presented with a hypothetical student experiencing test anxiety symptomatology. When generating the case study, the hypothetical student presented with physiological, cognitive, and emotional symptoms of test anxiety. Any single behavior or symptom can be commonly encountered by teachers. However, the combination of these behaviors together likely facilitated the ability of teachers to identify test anxiety. Research has shown that test anxiety negatively impacts many students. Based on the research of the prevalence of test anxiety, it is likely that many of the teachers surveyed have encountered students with similar symptomology. This would assist them in recognizing the signs and manifestation of test anxiety of students in their own classrooms, and therefore, of the hypothetical student in the case study that provided several common symptoms.

The second research question assessed whether teachers would be able to generate a greater number of general recommendations, interventions and instructional modifications for students with test anxiety when they were presented with increasing amounts of disorder information. In a similar case study that examined diabetes mellitus, Cunningham and Wodrich (2006) found that teachers provided significantly more disease specific accommodations when provided with a case of a student with a diagnosis of diabetes and/or educational implications as compared to teachers who were provided with a case that only included a description of behavior and no additional information. Based on the findings of this research, it was hypothesized that teachers who were presented with a case that described a child with anxiety related behavior and a diagnosis of test
anxiety and/or symptomology information would generate significantly more interventions and instructional modifications when compared to teachers who were provided with only a case that described a child with anxiety related behavior. To test the relationship between the outcome variable and the level of information presented, a one-way ANOVA and a follow-up a Kruskal-Wallis analysis was conducted and was found to be significant. Tukey’s post-hoc tests were conducted and revealed that there was a significant difference between merely receiving a case study and receiving a case study and a diagnosis. There were no other significant differences between levels of information presented. This indicated that teachers who received only a case study made more recommendations than teachers who received a case study and a diagnosis.

It is hypothesized that teachers, when presented with only a case study depicting a student with internalizing symptoms, produced a greater number of general recommendations geared specifically at the various symptomology presented in the case study. It is possible that when they were provided with more information regarding the diagnosis and symptoms of test anxiety their focus was narrowed and teachers generated fewer, what they believed to be, more anxiety specific recommendations.

The third research question explored whether teachers were able to generate a greater total number of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals) when presented with increasing amounts of disorder information. Similar to the findings in Cunningham and Wodrich (2006) in which teachers were able to generate a greater number of accommodations when provided with increased disorder information, it was hypothesized that teachers would be able to create a greater total number of reasonable
recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals) when provided with a diagnosis or a diagnosis and symptomology information. In order to derive more specific information from the data, anxiety specific, research-based interventions, evidenced based behavioral techniques, and mental health referrals were examined separately. These individual variables were then combined to derive a value indicative of the total number of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals) for students who experience test anxiety.

First, a separate one-way ANOVA and a follow-up Kruskal-Wallis test were conducted using the independent variable and the number of anxiety specific, research based interventions and indicated no significance. Next, a separate one-way ANOVA and a follow-up Kruskal-Wallis was conducted using the independent variable and the number of research based, behavioral techniques as the dependent variable. Again, no significance was found. Finally, at separate one-way ANOVA a follow-up Kruskal-Wallis test was conducted using the independent variable and the total number of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals). The ANOVA indicated no significance. However, the Kruskal Wallis test was found be significant. Follow-up Mann-Whitney tests indicated that there was a significant difference between the means of the group that received a case study only and the group that received a case study and a test anxiety diagnosis. Teachers who were given only the case study were able to generate a greater quantity of total reasonable recommendations. Further, there
was a significant difference in the means between the group that received the case study and a diagnosis and the group that received the case study, diagnosis and disease specific information. Teachers who received the case study, diagnosis, and disease specific information were able to generate a greater number of reasonable recommendations. Finally, there were no significant differences observed between teachers who received the case study only and teachers who received the case study, diagnosis and additional symptomology information.

As with the findings in research question number two, it is hypothesized that teachers, when presented with only a case study depicting a student with symptoms of anxiety, produced a greater number of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals) because they were geared to respond specifically to the various symptoms and behaviors presented in the case study. It is possible that when they were provided with more information regarding the diagnosis of test anxiety, their focus was narrowed and teachers generated fewer, but what they believed to be, more anxiety specific recommendations. Once teachers were aware of the test anxiety diagnosis, the quantity of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals) increased when further information regarding test anxiety symptomology was provided. It is hypothesized that when provided with test anxiety symptomology, teachers were able to generate additional recommendations based on the behaviors and symptomology provided.
In summary, analysis of the findings indicate that teachers were not able to generate a greater number of reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals) for students with test anxiety when presented with additional information of a specific diagnosis of test anxiety. Contrary to expectations, teachers generated a greater number of reasonable recommendations when given only the case study of a student presenting with an array of behaviors. Providing teachers with diagnostic information resulted in a decrease in their ability to generate anxiety specific interventions, instructional modifications and professional referrals. However, teachers who were provided with the case study, a test anxiety diagnosis and additional information were able to generate a greater number of reasonable recommendations when compared to teachers who were provided with the case study and a diagnosis. Finally, teachers who were provided with only a case study were able to generate a similar number of reasonable recommendations when compared to the group of teachers who were provided with a case study, a test anxiety diagnosis and additional information.

In analyzing the second research question, it was hypothesized that teachers who were provided with only a general case study and no diagnostic information were able to generate a greater number of overall recommendations because their focus had not been narrowed by the diagnosis. It was expected that with a narrowed focus and a more specific diagnosis that teachers would be able to generate, albeit, fewer recommendations, but that these recommendations would be of better quality and more evidence based. This was not the case. The results indicate that providing teachers with the diagnosis actually hampered their ability to generate reasonable or better quality
recommendations when compared to teachers who were given the case study alone. This supports a hypothesis that teachers were “throwing out the net” when presented with a case study alone and were likely generating a list of recommendations based on the discrete behaviors depicted in the story. In this way, teachers were able to generate a greater number of overall recommendations. Likewise, the number of reasonable, greater quality recommendations increased correspondingly.

When examining the second research question, it was found that teachers who were provided with a case study, diagnosis and additional information were not able to generate a greater number of general recommendations when compared to teachers who were provided with case study and diagnosis. Based on this finding, it would be expected that teachers who were provided with a case study, diagnosis and additional information would not be able to generate a greater number of reasonable, quality recommendations when compared to teachers who were provided with the case study and diagnosis. This, however, was not the case. Teachers who were provided with the additional information were able to generate a greater number of reasonable, quality recommendations. When given the additional information about a test anxiety diagnosis, teachers narrowed their focus because they thought they knew what to do. However, when they were provided the additional information, it is believed that this required teachers to think about anxiety and the specific discrete symptoms. It is hypothesized that when teachers were provided with test anxiety symptomology, they were able to generate more specific, anxiety related recommendations based on the symptomology. Because this relationship was not evident in the number of general recommendations that teachers made, it can be assumed that providing additional symptomology information resulted in an improvement of teacher
ability to generate a greater number of reasonable, quality recommendations while limiting the inclusion of inappropriate responses.

Finally, the findings of this research indicated that there was no significant difference in the number of reasonable, quality recommendations made by teachers who received the case study alone and teachers who received the case study, diagnosis and additional information. In fact, these two groups generated a similar number of reasonable recommendations. It is hypothesized that when teachers were provided with the case study alone, they “threw out the net” and generated their recommendations based on the behaviors of the child depicted in the case study. Teachers who were provided with the case study, diagnosis and additional information in the form of a list of symptomology were able to generate a similar number of reasonable recommendations. It is possible that teachers employed a similar strategy used by teachers who were given the case study alone, by generating recommendations based on the symptomology. This does not appear to fully explain the findings since teachers who were provided with the additional information did not produce a greater number of general recommendations. This indicates that when provided with additional information about symptomology, teachers actually learned more about test anxiety. This knowledge provided them with greater insight when generating reasonable recommendations.

The fourth research question explored whether the frequency of referral to mental health services (school psychologist, guidance counselor, referral to counseling in the community) increased when teachers were presented with increasing amounts of disorder information. Although previous research indicated that teachers were less likely to refer students who experienced internalizing symptomology, such as found in anxiety,
compared to disruptive behavior (Pearcy, 1993), it was hypothesized that teachers who were presented with a case study of the student depicting anxious symptomology along with a mental health diagnosis would refer students for mental health counseling with the school guidance counselor, school psychologist or in the community setting. This research question was tested using the chi-squared test of independence. The chi-square value was not significant indicating that the level of information provided to the teacher was statistically unrelated to whether or not mental health referral was made.

In this analysis, mental health referrals referencing the school guidance counselor, school psychologist, or therapy within the community were collected. Answers that specifically referred to the school psychologist were also noted. Of the 99 teachers who were surveyed as part of this study, not one teacher mentioned a school psychologist as a mental health resource with the school setting. Most of the mental health referrals referenced the school guidance counselor as a resource for mental health counseling within the school setting. It is noted that four of the eight schools surveyed has an active school psychology department that meets monthly in each school to consult with teachers regarding students who may be at risk. These teachers have regular opportunity to assist in the identification of students who experience test anxiety and to consult with the school psychologist regarding accommodations and interventions. Further, the school psychologists are active in providing direct services to students who are at risk in these schools. Despite the active role the school psychologist plays in these schools, teachers failed to consider the school psychologist as a resource of information and service for the student depicted in the case study. This finding is of concern and indicates that teachers are not aware of the role a school psychologist plays in the educational setting through
indirect consultation with teachers for evidenced based interventions or through direct services with the individual student. This finding did not change when a school psychologist was easily accessible, available and active within the school on a regular basis.

The last analysis was conducted out of professional curiosity. Teachers provided the number of years they had taught (tenure) on the demographic profile. Pearson correlation coefficients were calculated to determine whether a relationship existed between the number of years taught and the; (a) total number of recommendations made; (b) the number of anxiety related research based interventions; (c) the number of behavioral-based techniques; and (d) the total number reasonable recommendations (combined anxiety specific, research based interventions, evidence based behavioral techniques and mental health referrals). The results of this analysis found that the number of years spent as a teacher was statistically unrelated to the outcome variables described above. This indicates that the number of years of classroom experience is not correlated with the ability of teachers to generate anxiety specific interventions, instructional modifications or mental health referrals.

The research regarding teacher ability to generate interventions and instructional modifications is limited. It could be hypothesized that teachers with more tenure have had more direct experience with students who experience test anxiety. This would increase their opportunity to research, consult with professionals, or try various techniques to assist their students. However, in the modern classroom, teachers are expected to educate students with various abilities in the general education classroom. In preparation for these inclusive classrooms, newer teachers are provided with coursework, information and
training specific to dealing with students with special needs. It is likely that less experienced teachers have been exposed to instructional techniques, interventions and instructional modifications through their educational training while tenured teachers have gained equal exposure through experience and practice.

**Limitations**

This study possesses threats to the external validity of the findings, or the extent to which the present results may be generalized to the total population of classroom teachers. Specifically, this study is limited by the number of schools that chose to participate. The schools canvassed for participation were restricted to a geographic region located in southwestern Pennsylvania. Although schools in urban, suburban and rural areas were canvassed, it was largely suburban schools that chose to participate. The classroom demands on teachers in urban schools are different and may impact the teacher's perception of the case information in unknown ways.

The data for this research was collected within a limited geographic region, and it can be assumed that many of the participating teachers received their certification in southwestern Pennsylvania. It is unknown whether Pennsylvania certification standards require specific training in child psychology, as compared to universities in different regions. This study could have been expanded to include elementary schools across Pennsylvania or even across different areas of the United States in order to investigate whether specific training in child psychopathology affects teacher ability to identify and make educational recommendations for students who experience test anxiety.

In addition, the sample was largely homogeneous to a Caucasian, female population. Although elementary educators in the United States are predominantly
female, gender differences are plausible. Furthermore, unknown is the extent to which variation in results by the racial/ethnic background of the teachers would be present. Finally, subjects who participated in this research were all elementary school teachers. It is unknown whether the results would be similar if high school teachers were included in the study. Future studies should examine a larger and more diverse sample size, in order to increase generalizability of the current findings.

Research has indicated that test anxiety is becoming more prevalent in today's schools and classrooms. Teachers with advanced degrees in the areas of psychology, counseling for special education and special education teachers who were likely to have received additional education and instruction on the intervention of emotional disturbance in students were eliminated from the dataset. However, general education teachers without apparent specialized training are likely to have direct experience with test anxious students due to the increased prevalence of test anxiety. As general education teachers, some may have consulted with the guidance counselor, school psychologist or conducted personal research to investigate interventions and instructional modifications to assist their students. These general education teachers may have acquired an advanced knowledge of anxiety specific interventions and instructional modifications through research and consultation with professionals. This would give them a significant advantage over their cohorts who have not pursued additional information, consultation or training.

**Recommendations for Future Research**

During the execution of this research, an operational definition of “quality” interventions and instructional modifications was necessary. An analysis of test anxiety
specific, research-based interventions was conducted. It was determined that although past research has been focused on defining, measuring and theorizing about test anxiety, very little research has been conducted on specific interventions that are shown to decrease the anxiety itself or its symptomology when compared to a control group. Absent from the operation definition of quality interventions is the inclusion of strategies that are rooted in evidence-based behavioral principles. Discussion and consultation with highly qualified school psychologists concluded that there were several behavioral techniques based in research that would likely remedy some of the symptomology associated with test anxiety. However, these techniques have never been examined in relation to test anxious students. This lack of anxiety specific research does not mean that a relationship does not exist. Future research examining these behavioral-based techniques with test anxious students would provide conclusive evidence that these techniques would benefit this particular group of students.

This research concluded that teachers were likely to generate more general recommendations when presented only with a description of student behavior when compared to teachers who were given a description of student behavior and diagnosis. It appeared that a mental health diagnosis may have intimidated teachers, resulting in fewer recommendations overall. Previous research indicates that teachers are more likely to refer students with externalizing symptomology for mental health services when compared to internalizing behaviors (Pearcy, 1993). Cunningham and Wodrich (2006) examined the relationship between teacher generated accommodations and level of information provided in a student with a medical diagnosis. It would be interesting to conduct a parallel case study depicting a student who presented with externalizing
behaviors to determine whether teachers are able to provide a greater quantity of appropriate interventions and behavioral techniques when provided with a non-emotionally based diagnosis.

This research concluded that providing teachers with additional information about a diagnosis did not result in an increase in the quantity, but did result in an improvement of the quality of interventions, behavioral techniques and mental health referrals generated by teachers. The additional information provided to teachers included a list of cognitive, behavioral and physiological symptoms of test anxiety. The reason as to why a list of test anxiety symptomology resulted in a greater total number of reasonable recommendations is not fully understood. This additional information may have caused teachers to think more deeply about test anxiety and that by learning more about test anxiety, they were able to more fully understand the nature of test anxiety, resulting in an improved ability to generate reasonable recommendations. However, by providing a list of test anxiety symptomology, teachers may have reverted to the “casting the net” strategy in which they provided recommendations based on the discrete symptomology provided in the additional information. Further research would be beneficial in helping understand the reason why teachers were able to generate more information when provided with disease symptomology. Finally, it is not yet known whether providing professional development instruction on anxiety related, research-based interventions and behavioral techniques would result in an increase in the actual implementation of these techniques in the classroom setting.

School psychologists can provide important services to students with mental health diagnoses in the school setting. If school psychologists’ practice is to be informed
by empirical research, more test anxiety specific studies are needed to determine what can be done to improve student outcomes. Further, teacher understanding of the role of the school psychologist as school-based consultant should be developed and encouraged if psychologists in the school setting are to be effective service providers.

**Implications**

This research indicates that teachers are able to identify anxiety related symptomology, particularly test anxiety symptomology when it is exhibited by students. However, teachers who were provided with a case study alone were able to generate a similar number of reasonable recommendations as compared to teachers who were provided with a case study, diagnosis and symptomology information. Providing a case study and a diagnosis actually resulted in a decrease in reasonable recommendations.

It was particularly interesting that teachers who were not provided with a specific diagnosis or additional information about the diagnosis were able to generate more overall recommendations when compared to teachers that were provided with additional information. It is possible that when teachers were given the diagnosis of test anxiety, they were less likely to produce a larger number of general recommendations in favor of generating fewer, better targeted recommendations. For example, one teacher who was given the case study with no additional information hypothesized that the student was experiencing test anxiety or a visual processing disorder. When asked to list interventions and instructional modifications, this teacher generated two separate lists, one for each hypothesis as to why the student was experiencing the problem depicted in the case study.
Analysis of teacher recommendations revealed that teachers were most comfortable in making recommendations that were easy to implement and were not time-consuming. This corroborates Fairbanks and Stinnett’s (1997) finding that teachers preferred interventions that take less time and are less intrusive to the classroom. Recommendations such as providing the student with chewing gum, preferential seating and sending a student out of the class for testing was common. Teachers demonstrated a preference for environmental accommodations that would result in an improved test score. However, many of these environmental accommodations have not been shown to result in an actual decrease in student anxiety or a reduction in test anxious symptomology.

Further, with respect to the field of school psychology, it is of great concern that none of the teachers surveyed identified a school psychologist as a resource for students in need of mental health services. Teachers who did recommend mental health services specifically mentioned the school guidance counselor or counseling in the community setting. The failure to mention the school psychologist indicates that teachers are not aware of the role of the school psychologist in their districts. Further, teachers may not be aware that the school psychologist has specific training in the counseling of students or that their role includes the provision of direct services to children.

This research indicates the need for improved teacher awareness of the role of the school psychologist as school-based consultant. To do this, school psychologist must promote the ongoing development of school psychological services that are designed to meet the educational and mental health needs of students. This includes assisting teachers in the identification of students in need of these services. School psychologists can
provide indirect services to students by working with teachers to facilitate the formulation and implementation of research based interventions and behavioral techniques that are designed for the specific needs of the student being referred. School psychologist can also provide direct services to students by providing mental health services and therapy. The school psychologist can assist teachers in identifying mental health issues, defining an intervention, implementing the intervention and re-evaluating the implementation results.

Finally, the role of school psychologist also includes staff development and in-service training for teachers and educators. The findings in this study determined that even when teachers were aware of the test anxiety diagnosis, they were unable to develop appropriate anxiety related interventions and behavioral techniques. Although the current findings of this research indicated a relationship between quality of reasonable recommendations and the provision of additional information about test anxiety symptomology, it is unclear whether providing teachers with anxiety specific, research-based interventions and instructional techniques would result in an increase in the actual implementation of these techniques in the classroom setting.
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Appendix A

Duquesne Internal Review Board Approval

DUQUESNE UNIVERSITY
Office of Research
424 RANGOS BUILDING ♦ PITTSBURGH, PA 15282-0202

Dr. Joseph C. Kush
Chair, IRB-Human Subjects
Office of Research
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E-mail: kush@duq.edu

March 19, 2012

Re: Teachers’ Ability to Identify a Classroom Problem and Related Interventions – (PROTOCOL # 12-37)

Dr. Ara J. Schmitt
School of Education
Duquesne University
Pittsburgh PA 15282

Dear Dr. Schmitt,

Thank you for submitting the research proposal of you and your student, Ms. Susan Lazar, to the Institutional Review Board at Duquesne University.

Based on the review of IRB representative Dr. Rick A Myer, and my own review, your study is approved as Exempt based on 45-CFR-46.101.b.1 regarding research conducted in established or commonly accepted educational settings, involving normal educational practices.

The consent form is attached, stamped with IRB approval and expiration date. You should use the stamped form as the original for copies you display or distribute.

The approval pertains to the submitted protocol. If you or Ms. Lazar wish to make changes to the research, you must first submit an amendment and receive approval from this office. In addition, if any unanticipated problems arise in reference to human subjects, you should notify the IRB chair before proceeding. In all correspondence, please refer to the protocol number shown after the title above.
Once the study is complete, please provide our office with a short summary (one page) of your results for our records.

Thank you for contributing to Duquesne’s research endeavors.

Sincerely yours,

Joseph C. Kush, Ph.D.

C: Dr. Rick A Myer
IRB Records
Appendix B

Teacher Consent to Participate in Research Study

TEACHER CONSENT TO PARTICIPATE IN A RESEARCH STUDY

TITLE: Teachers' Ability to Identify a Classroom Problem and Related Interventions

INVESTIGATORS:

Principal Investigator / Faculty Sponsor:
Dr. Ara Schmitt, Associate Professor of Education,
Duquesne University
102 E Canevin Hall
412-396-1057

Secondary Investigator:
This survey is being conducted by Susan Lazar Oliverio in fulfillment of the requirements for the degree of doctor of philosophy in the School Psychology program at Duquesne University.

Susan Lazar Oliverio
676 E. Village Green Blvd.
Mars, PA
724-816-8584

PURPOSE:
You are being invited to take part in a research study because you are an educator of elementary school students. This study will investigate the ability of teachers to identify problem behavior and identify appropriate accommodations and interventions for a student portrayed in a case study. The results of this research will help us learn the extent to which teachers can identify problem behavior and think of appropriate strategies to address the problem behavior based on the information available to them.
First, participation in this study will involve completing a demographic information page (e.g., terminal degree, years of service, age, etc.). Next, you will read a case study that includes information that is available to the classroom teacher and then identify what you believe is the cause of the student’s classroom problem (approximately 5 minutes). You will then be asked to list any accommodations or interventions that you believe may improve the problem depicted in the case study (approximately 5 to 10 minutes).

**RISKS AND BENEFITS:** These findings may add to the scientific literature regarding the ability to teachers to identify specific classroom problems and generate intervention ideas. There are no foreseeable risks associated with this study and risk is likely less than one would anticipate in everyday life.

**COMPENSATION:** There is no compensation for participation in this study. However, participation in the project will require no monetary cost to you.

**CONFIDENTIALITY:** All information learned during the course of this study will be kept confidential. The paper on which you provide your information and responses will be identified only by a code number. Your name will not be associated with your responses. As such, no identifying information will be included in data analyses or any publications of this research. All written materials and consent forms will be stored in a locked file in the secondary researcher's office.

**RIGHT TO WITHDRAW:** You are under no obligation to participate in this study. There will be no negative consequences for you at work if you choose not to participate, or if you choose to withdraw your participation.

**SUMMARY OF RESULTS:** A summary of the results of this research will be supplied to you, at no cost, upon request.

**VOLUNTARY CONSENT:** I have read the above statements and understand what is being requested of me. I also understand that my participation is voluntary and that I am free to withdraw my consent at any time, for any reason, and with no negative
consequences. On these terms, I certify that I am willing to participate in this research project.

I understand that should I have any further questions about my participation in this study, I may call Dr. Joe Kush, Chair of the Duquesne University Institutional Review Board (412-396-6326).

CONTACT INFORMATION:
Should you have any further questions or concerns about this research, you may contact Susan Oliverio or her advisor, Ara Schmitt, at the address and telephone number given below.

Principal Investigator: Ara Schmitt
Address: Duquesne University, Department of Counseling, Psychology, and Special Education, G3A Canevan Hall, Pittsburgh, PA
Telephone Number: 412-396-1057
Email: schmitta2106@duq.edu

Secondary Investigator: Susan Oliverio
Address: 676 Village Green Blvd. , Mars, PA 16046
Telephone Number: 724-816-8584
Email: slazar@zoominternet.net

If you have any questions about your rights as a participant in a research project or for more information on how to proceed should you believe that you have been injured as a result of your participation in this study, you should contact the Chair of the Duquesne University Institutional Review Board:

Dr. Joseph Kush
Duquesne University
Room 424 Rangos Building
Telephone Number: 412-396-6326
Email: kush@duq.edu

_________________________________________ ____________________
Participant's Signature Date

_________________________________________ ____________________
Researcher's Signature Date
Appendix C

Demographic Questionnaire

Please circle the appropriate answers and fill in the blanks when indicated.

1. What is your sex?  Male  Female

2. How many years of teaching experience do you have?  ___________

3. Are you currently a
   ___ General Education teacher
   ___ Special Education teacher
   ___ Counselor
   ___ Other  ____________________________________

4. What is your terminal degree (highest achieved degree)?  (please check the one option that best describes you)
   ___ Bachelors
   ___ Masters
   ___ Ph.D.

5. Indicate your degree area of specialty. ______________________________

6. What is your age?  _____

7. How do you describe yourself? (please check the one option that best describes you)
   ___ American Indian or Alaska Native
   ___ Hawaiian or Other Pacific Islander
   ___ Asian or Asian American
   ___ Black or African American
   ___ Hispanic or Latino
   ___ Non-Hispanic White
Appendix D

Level I Case Study

Mark is a nine-year-old boy who attends the 4th grade at a public school. Mark is a hard-working student who always tries his best at school. He has a history of not doing well on exams. Mark recently told his teacher, Mrs. Jones, that he didn’t think that he was going to do well on an upcoming math test. Mrs. Jones had been sure to review with the class all of the math concepts that would be on the test. She also spent extra time with Mark during independent seatwork to make sure he was able to correctly complete math problems that were similar to ones that would be on the test.

On the day of the math test, Mark reported to Mrs. Jones that he felt ill and needed to see the school nurse. The nurse determined that Mark was well enough to return to class in time for the test. During the test, Mrs. Jones noticed that Mark stared at the test and that he had completed fewer questions than other children in the class. She also noticed that he was fidgety and sharpened his pencil twice. Mrs. Jones was concerned that he really may not be feeling well because he appeared flushed.

While grading the math tests, Mrs. Jones noticed that Mark made many careless errors throughout his exam. Some questions were left unanswered, even though Mark had demonstrated the ability to answer similar questions the day before. Mark failed the test.

Based on the scenario above, why do you think Mark failed the test?

What accommodations or interventions might have been helpful for Mark in the testing situation above, or in future testing situations such as this?
List:

Continue on back if needed
Level II Case Study

Mark is a nine-year-old boy who attends the 4th grade at a public school. Mark is a hard-working student who always tries his best at school. He has a history of not doing well on exams. Mark recently told his teacher, Mrs. Jones, that he didn’t think that he was going to do well on an upcoming math test. Mrs. Jones had been sure to review with the class all of the math concepts that would be on the test. She also spent extra time with Mark during independent seatwork to make sure he was able to correctly complete math problems that were similar to ones that would be on the test.

On the day of the math test, Mark reported to Mrs. Jones that he felt ill and needed to see the school nurse. The nurse determined that Mark was well enough to return to class in time for the test. During the test, Mrs. Jones noticed that Mark stared at the test and that he had completed fewer questions than other children in the class. She also noticed that he was fidgety and sharpened his pencil twice. Mrs. Jones was concerned that he really may not be feeling well because he appeared flushed.

While grading the math tests, Mrs. Jones noticed that Mark made many careless errors throughout his exam. Some questions were left unanswered, even though Mark had demonstrated the ability to answer similar questions the day before. Mark failed the test.

Based on the scenario above, why do you think Mark failed the test?
Mrs. Jones was very concerned that Mark failed the math test, especially since it was her impression that Mark was prepared and had the math skill necessary to do well on the test. She decided to call Mark’s parents to express her concern. The phone conference was very helpful to Mrs. Jones as she learned that Mark has been diagnosed with anxiety, and test anxiety specifically, by two different psychologists.

What accommodations or interventions might have been helpful for Mark in the testing situation above, or in future testing situations such as this?

List:

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Level III Case Study

Mark is a nine-year-old boy who attends the 4th grade at a public school. Mark is a hard-working student who always tries his best at school. He has a history of not doing well on exams. Mark recently told his teacher, Mrs. Jones, that he didn’t think that he was going to do well on an upcoming math test. Mrs. Jones had been sure to review with the class all of the math concepts that would be on the test. She also spent extra time with Mark during independent seatwork to make sure he was able to correctly complete math problems that were similar to ones that would be on the test.

On the day of the math test, Mark reported to Mrs. Jones that he felt ill and needed to see the school nurse. The nurse determined that Mark was well enough to return to class in time for the test. During the test, Mrs. Jones noticed that Mark stared at the test and that he had completed fewer questions than other children in the class. She also noticed that he was fidgety and sharpened his pencil twice. Mrs. Jones was concerned that he really may not be feeling well because he appeared flushed.

While grading the math tests, Mrs. Jones noticed that Mark made many careless errors throughout his exam. Some questions were left unanswered, even though Mark had demonstrated the ability to answer similar questions the day before. Mark failed the test.

Based on the scenario above, why do you think Mark failed the test?
Mrs. Jones was very concerned that Mark failed the math test, especially since it was her impression that Mark was prepared and had the math skill necessary to do well on the test. She decided to call Mark’s parents to express her concern. The phone conference was very helpful to Mrs. Jones as she learned that Mark has been diagnosed with anxiety, and test anxiety specifically, by two different psychologists.

**Characteristics of Anxiety, Including Test Anxiety**

Many children experience anxiety and anxiety surrounding tests. If you or your child’s teacher notice the following signs in the classroom, particularly surrounding testing situations, a consultation with a mental health professional may be necessary.

<table>
<thead>
<tr>
<th>Cognitive</th>
<th>Behavioral</th>
<th>Physiological</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration problems</td>
<td>Motor restlessness</td>
<td>Tics</td>
</tr>
<tr>
<td>Memory problems</td>
<td>Fidgets</td>
<td>Recurrent, localized pain</td>
</tr>
<tr>
<td>Attention problems</td>
<td>Task avoidance</td>
<td>Rapid heart rate</td>
</tr>
<tr>
<td>Oversensitivity</td>
<td>Rapid speech</td>
<td>Flushing of the skin</td>
</tr>
<tr>
<td>Difficulty solving problems</td>
<td>Erratic behavior</td>
<td>Perspiration</td>
</tr>
<tr>
<td></td>
<td>Irritability</td>
<td>Headaches</td>
</tr>
<tr>
<td>Worry</td>
<td>Withdrawal</td>
<td>Muscle tension</td>
</tr>
<tr>
<td>Cognitive dysfunctions</td>
<td>Perfectionism</td>
<td>Sleeping problems</td>
</tr>
<tr>
<td>- Distortions</td>
<td>Lack of participation</td>
<td>Nausea</td>
</tr>
<tr>
<td>- Deficiencies</td>
<td>Failure to complete tasks</td>
<td>Vomiting</td>
</tr>
<tr>
<td>Attributional style problems</td>
<td>Seeking easy tasks</td>
<td>Enuresis</td>
</tr>
</tbody>
</table>

What accommodations or interventions might have been helpful for Mark in the testing situation above, or in future testing situations such as this?

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Rubric for the Definition of Anxiety

Acceptable correct answers listed below will indicate anxiety as the underlying problem depicted in the case study. Answers that indicate anxiety or synonyms for anxiety as indicated in Merriam-Webster.com and the DSM-IV-TR are considered correct (anxiety, 2011; American Psychiatric Association, 2000). These synonyms include, but are not limited to:

- nervous;
- worry;
- concern;
- unease;
- apprehension;
- disquiet;
- angst;
- fear;
- distress;
- terror;
- trauma
- dread; or
- panic.
Appendix F

Rubric of Research Based Interventions for Students with Test Anxiety

The following is a description of acceptable types of intervention and instructional modifications for students with test anxiety as based on a computer based search of: Educational Resources Information Center (ERIC; 1959–2011), PsycINFO (1930–2012), and psycARTICLES (1936-2011) databases using the keywords test anxiety + intervention, test anxiety + cognitive, test anxiety + accommodations, test anxiety + therapy, test anxiety + treatment and test anxiety + counseling.

**Instructional modifications.** Teachers are in a unique position to be able to create a testing environment that is more user friendly and less anxiety evoking for test anxious students. The teacher is able to provide instructional modifications that do not focus on changing the anxiety, but on changing the test, testing situation or student skill level. Acceptable research based instructional modifications include:

- Provide task oriented instructions such as “Concentrate”, “Keep focused”, “Avoid thinking about other things.” (Holroyd, 1976),
- Provide extra time (Hill & Eaton, 1977),
- Provide memory supports / scaffolding (Seiber, Kameya & Paulson, 1970),
- Allow students to write about their fears before the exam (Ramirez & Bielock, 2011), or
- Provide pre-test instructions that emphasize task relevant strategies (Holroyd, 1976).
**Emotion focused behavioral intervention.** Emotion focused interventions are designed to alleviate negative emotional affect experienced by test anxious students. Test anxious students frequently report high levels of arousal during testing situations and are frequently preoccupied with their own internal physiological processes. Emotion focused behavioral techniques provide test anxious students with coping strategies for managing physiological arousal angry activity. Acceptable research based emotion focused behavioral interventions include:

- Relaxation therapy / training such as deep breathing exercise, progressive muscle relaxation training or cued controlled relaxation (Deffenbacher & Suinn, 1988; Denney, 1980; Chang-Liang & Denney, 1976; Marchetti, McGlynn & Patterson, 1977; Russell, Wise & Stratoudakist, 1976),

- Systematic desensitization (Deffenbacher & Suinn, 1988; Laxer, Quarter, Kooman & Walker, 1969; Russell & Lent, 1982).

**Cognitive intervention.** Cognitive therapy is a generic term that refers to a wide array of therapeutic approaches directed towards changing the worry and irrational thought patterns of test anxious students. The primary assumption shared by cognitive models of test anxiety is that these cognitive processes mediate the individual’s emotional and behavioral responses to evaluative situations. Cognitive therapy modifies these negative emotional reactions of test anxious students to evaluative situations by redirecting and reshaping the faulty premises, assumptions and negative attitudes that undermine maladaptive cognitions of test anxious students. Acceptable cognitive interventions include, but are not limited to the following:
• Cognitive attentional training on how to focus on task relevant variables through attention directing self-instructions (Wise & Haynes, 1983),

• Rational emotive therapy that teaches students how to challenge and dispute their irrational thoughts and false assumptions so that they can replace them with more realistic ones (Fletcher & Spielberger, 1995; Wessel & Mersch, 1994),

• Systematic rational restructuring where students become aware of their own task irrelevant thoughts as they occur during examinations, stop such thoughts, and substitute positive self statements to redirect their attention to the task at hand (Denney, 1980; Goldfried, Linenan & Smith, 1978; Holroyd, 1976).