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Treating Test Anxiety in Students with Learning Difficulties: An Exploratory Study

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TREATING TEST ANXIETY IN STUDENTS WITH LEARNING DIFFICULTIES:
AN EXPLORATORY STUDY

BY
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I can do everything through Him who gives me strength. Philippians 4:13

Thank you God for giving me strength and peace during this entire process; I offer this accomplishment up for your Glory.

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ABSTRACT

The current exploratory study examined nine individual case studies to better understand the process of test anxiety and test anxiety treatment through students with and without learning difficulties. Select students participated in a nine-week test anxiety reduction treatment program that used progressive muscle relaxation and systematic desensitization to help them improve their levels of anxiety while studying, their efficiency while studying, their overall degree of academic competency, and their grade point averages.
CHAPTER 1  
INTRODUCTION

Anxiety is not a new phenomenon, nor is it a lightly researched area of study. As Lufi, Okasha, and Cohen (2004) discuss, anxiety is perhaps one of the most researched areas of the human condition. In this extensively researched construct, it is common among researchers to separate anxiety into two types or categories: trait anxiety and state anxiety. Speilberger (1966) was among the first to make this distinction. Trait anxiety is an enduring personality characteristic, in which people respond on physical, psychological, and behavioral levels to anxiety producing situations with sometimes incapacitating reactions (Hedl, 1972; Sarason, 1975; Speilberger, 1972; Trent & Maxwell, 1980). State anxiety, on the other hand, is a more fleeting anxious reaction to a specific situation. If the situation is determined to be objectionable, then an anxious physical, psychological or behavioral reaction will be elicited (Lufi, Okasha, & Cohen, 2004).

Test anxiety, which is typically referred to as a type of state anxiety, is present in academic and evaluative settings, and is also known as evaluative stress and performance anxiety. Although test anxiety is largely categorized as state anxiety, some researchers suggest that test anxiety has a trait subtype (Lufi, Okasha, & Cohen, 2004). Trait test anxiety is defined as a pervasive evaluative threat, present in all testing or evaluative conditions; whereas state test anxiety is defined as a fleeting, temporary feeling, brought about by a specific testing situation. Individual state anxiety has been found to be less stable, over time, than trait anxiety; however, state test anxiety has routinely been found to be more strongly related to academic performance than trait test anxiety (Hong & Karstensson, 2002; O'Neil & Fukumura, 1992). Conversely, it has been suggested by some researchers that students with elevated trait anxiety scores have higher levels of trait test anxiety, which could conceivably affect academic performance in all areas. (Hong & Karstensson, 2002; Head & Knight, 1988; Hong, 1998). However, the majority of research defines test anxiety as a state anxiety (Lufi, Okasha, & Cohen, 2004). What is agreed on is the definition of test anxiety, which is the overwhelming fear of failure; more specifically, an overwhelming fear of the consequences of that failure (Benjamin et al., 1981; Hancock, 2001). There are thought to be two primary manifestations of test anxiety: cognitive and physiological. The cognitive manifestations are referred to as “worry” and the physiological manifestations as “emotionality” (Liebert & Morris, 1967; Sarason, 1980, 1984; Speilberger, 1972). Worry is the cognitive distraction or cognitive failure that interferes with the student’s ability to perform successfully in evaluative situations. Worry affects the student by blocking learning and storage of required information, retrieval of the required information, and by producing thoughts that are unrelated to the task at hand (Morris, Davis, & Hutchings, 1981; Schwarzer, 1984; Spielberger & Vagg, 1995). Emotionality is the physiological component. Emotionality includes an increase in perspiration, respiration, heart rate, blood pressure, and muscle tension, and affects the individual on a physical level. It has been suggested that physiological manifestations cause impairments to performance only when the cognitive manifestations are also present. The cognitive component is most consistently associated
with a decline in performance; however, Hembree (1988) found that worry (cognitive manifestations) is experienced only after noticing heightened levels of physiological arousal (Hembree, 1988, Morris, Davis, & Hutchings, 1981; Schwarzer, 1984; Spielberger & Vagg, 1995). It is also suggested that physiological manifestations are lessened when confidence is held high (Deffenbacher, 1980).

Maintaining high academic self-confidence is a problem for some students and in some situations it can be hard for nearly all students. Students who have a history of academic failure or difficulties are likely to have lower academic confidence than their peers. Students with learning difficulties or learning disabilities often have a history of academic failure or challenges and as a result are likely to have a lower level of academic self-efficacy (Brinkerhoff, Shaw, & McGuire, 1993; Hill, 1996; Stolowitz, 1995). Additionally, certain high stakes testing environments can also exacerbate test anxiety. Hancock (2001) and Stipek (1998) found that perceived high levels of evaluative threat increased test anxiety levels and decreased performance levels in most students, even students with mild levels of test anxiety. Today’s high stakes world of testing serves to exacerbate the level of test anxiety that is experienced by all students, and most specifically those students who have a lower level of academic self-concept, such as students with learning difficulties (Brinkerhoff, Shaw, & McGuire, 1993; Hill, 1996; Stolowitz, 1995).

Statement of the Problem

Although test anxiety has been extensively researched and empirically supported treatments exist, there remains a paucity of research on the co-morbidity of test anxiety and learning difficulties. It is well documented that students with learning difficulties are more prone to test anxiety than their typically achieving peers (Bryan, et al., 1983; Hill, 1972; Hoy et al., 1997; Rizzo & Zabel, 1988; Swanson & Howell, 1996). It is also well documented that they have many of the traits that make them more susceptible to debilitating levels of test anxiety (Brinkerhoff, Shaw, & McGuire, 1993; Hill, 1996; Stolowitz, 1995); however, what is not well documented is the application of current test anxiety treatments to this population. There are few studies that evaluate the empirically supported test anxiety treatments with a population of students with learning difficulties. Additionally, little is known or documented about the process that occurs during the treatment of test anxiety.

Purpose of the Current Exploratory Study

The purpose of this study is to obtain a comprehensive picture of the process of test anxiety and test anxiety treatment. The current study examined various constructs: test anxiety, state and trait anxiety, distress while studying, efficiency while studying, reported feelings of academic self-confidence, hours spent studying, and grade point average. It examined the change process for seven individuals. Additionally, this study looked at how select participants with slight variations in cognitive abilities, learning difficulties, and level of test anxiety respond to the treatment program, and how durable the treatment program is for these individuals. This study used a qualitative case study methodology to examine the processes involved in an empirically supported test anxiety
treatment. This study serves to contribute to the largely unexplored relationship between learning difficulties and test anxiety. Finally, the study evaluated the efficacy of combining two different test anxiety treatments: progressive muscle relaxation (PMR) and systematic desensitization (SD).

Research Questions

The following research questions have been formulated.

1. Will systematic desensitization (SD) combined with progressive muscle relaxation (PMR) be an effective test anxiety intervention for a small sample of selected participants, including students with a diagnosed learning difficulty and students with no diagnosed learning difficulties?
2. What is the process of change, over the nine-week period of the study, for distress, efficiency, competence, test anxiety, trait anxiety and state anxiety for each of the participants?
3. During the first five-weeks of treatment, when only PMR is being used, is improvement shown on any of the process measures (e.g., distress, efficiency, competence, test anxiety, trait anxiety, state anxiety)?
4. During the second four weeks of treatment, when both SD and PMR are being used, is improvement shown on any of the process measures (e.g., distress, efficiency, competence, test anxiety, trait anxiety, state anxiety)?
5. Are process differences evidenced across type of student (e.g., diagnosed learning difficulty and students with no diagnosed learning difficulties)?
6. How does hours-spent-studying change over the course of the treatment period?
7. Does time in the semester affect the amount of time spent studying?
8. Are differences in the time spent studying evidenced across type of student (e.g., diagnosed learning difficulty and students with no diagnosed learning difficulty)?
9. In general, do there appear to be different treatment effects across different areas (e.g., distress, efficiency, competence, test anxiety, trait anxiety, state anxiety)?
10. In general, do participants show differences in level of trait anxiety versus state anxiety?
11. In general, do participants show differences in level of emotionality versus worry?
12. At the end of treatment, are the participants experiencing improvement in the areas of distress, efficiency, competence, test anxiety, trait anxiety, state anxiety?
13. At the end of treatment, do participants report an improvement in academic performance as measured by GPA?
14. At a six-month post-treatment follow-up, is there continued improvement in test anxiety, trait anxiety, state anxiety, and GPA?

Assumptions

This study will be conducted under the following broad assumptions:

1. Despite limited measurement error, the TAI reliably and validly measures symptoms of TA in students.
2. Despite limited measurement error, the STAI reliably and validly measures symptoms of state and trait anxiety in students.
3. Self-report inventories are accurate, valid and reliable measures of the participants' experiences.
4. A student with a previously diagnosed learning disability (LD) is presumed to have the LD, and therefore a learning difficulty, at present.
5. A student who was referred for a learning disability evaluation, and was not diagnosed with a learning disability is presumed to have learning difficulties, but not to have an LD. A student without a diagnosed LD, who was not referred for a learning disability evaluation is presumed not to have learning difficulties other than the difficulties presented by the test anxiety.
6. Grade point average is considered indicative of academic performance.
CHAPTER 2
REVIEW OF THE LITERATURE

Several issues will be addressed in this chapter; the first will be a presentation of the most prominent theories of test anxiety followed by an overview of learning disabilities and the unique challenges of the comorbid relationship of test anxiety and learning difficulties. Next, test anxiety treatments will be examined, with an comprehensive look at systematic desensitization and progressive muscle relaxation. Finally, a summary will address this study’s particular theoretical basis and treatment program development.

Theories of Test Anxiety

The literature presents several plausible theories regarding test anxiety. These theories include, but are not limited to, interference problems, learning deficits, ineffective study habits and ineffective test taking skills, information processing difficulties (which for the purposes of our discussion will include working memory difficulties), lower intelligence, lower self-efficacy and expectations, perfectionistic traits, high evaluative threat, and high importance of the test.

Interference Models

The interference models are all rather similar, in that they presuppose that some other information interferes with the retrieval process of the information needed for the examination or the evaluation at hand. Task irrelevant thoughts, worry, and negative self-talk distract the student from focusing on the information needed for the examination or evaluation; therefore, they are unable to retrieve the required information. The larger implication here is that the individual has been able learn the information; they simply cannot retrieve it when they need to.

Mandler & Sarason (1952) advanced the cognitive interference model, which states that anxiety responses interfere with the evaluative process, and subsequently test performance. This theory states that students with severe test anxiety perform unsuccessfully primarily because they are unable to hold back competing thoughts during tests (Cassady & Johnson, 2002). Wine's (1971, 1982) cognitive-attentional theory of test anxiety, which added an attentional component to the interference model, is based largely on Mandler & Sarason's (1952) earlier work. Wine's theory postulates that test anxious students are less able to focus on the task at hand, and their thoughts fluctuate between personal variables and test related information; therefore, they are less able to attend to the cognitive task at hand and their performance suffers. These competing thoughts can simply be worries, social comparisons, feelings of ill preparedness, or ruminations of a self-deprecating nature (Sarason, 1961; Sarason, 1984; Schultz & Davis, 2000; Schwarzer & Jerusalem, 1992). Ruminations and negative self-talk can interfere with the retrieval of information. Lee (1999) found that test anxious students are likely to engage in this practice of negative self-talk. Self-talk (typically self-blaming) occurs during the test, supplies competing thoughts and supports an increase in
test anxiety. Schultz & Davis (2000) found that it is not just the character of the self talk, (in this instance, negative self-blaming) but also the frequency, duration, and intensity that dictates the anxiety sensations experienced (Deffenbacher, 1986; Hembree, 1988; Lee, 1999; Schultz & Davis, 2000).

The interference model and the cognitive-attentional model both state that anxiety moves one’s focus away from the task at hand to more task-irrelevant thoughts (worry). This attention shift, or divided attention, hinders the student cognitively, and reduces their ability to focus on, and apply the information they have studied and newly learned to the exam questions. Wine (1971) reported that students with higher test anxiety also pay even more attention to the task irrelevant thoughts; this leaves little attention left for the task relevant thoughts. Non test anxious students do not have this same difficulty, as they are able to focus on the test exclusively (Bailey, Onwuegbuzie, & Daley, 2000; Wine, 1971).

Early studies could not verify a direct relationship between anxiety and academic performance, which made it difficult to support the interference model. An early review of 49 test anxiety treatments showed significant test anxiety reductions for most of the studies, but only 18% of the studies demonstrated an accompanying academic improvement (Allen, Elias, & Zlotlow, 1980; Hembree, 1988). A second meta-analysis supported these findings (Tryon, 1980). Subsequent studies, however, have found support for the interference model, but these early findings helped give credence to a deficit model for the explanation of test anxiety.

**Deficit Models**

Deficit models purport that test anxious students have fewer or poorer study skills, lower abilities, and engage in ineffective test taking. In these models the interference in performance is the student's ability to study properly, a lowered intellect, and an inability to take exams, not task-irrelevant thoughts.

The two deficit models examined here are the learning deficit model, and the study coping strategies model. Both of these models propose that students experience test anxiety because they have poor study skills. The learning deficit model also includes lower student ability in its model. The learning deficit model purports that the student's knowledge may be reduced as a result of inferior study skills and their failure to learn the requisite information is due to both the student’s poorer study skills and the student’s lower intellectual abilities. When it is time to take the test the students realize that they are ill-prepared for the exam because of their limited knowledge of the material and are subsequently anxious about the test, which further reduces their performance (Culler & Holahan, 1980; Lin & McKeachie, 1970; Paulman & Kennelly, 1984; Witmaier, 1972). The subsequent poor performance leads to harmful pessimistic attitudes toward evaluation, which can exacerbate the anxious reaction to future testing (Culler & Holahan, 1980; d'Alelio, 1983; Kirkland & Hollandsworth, 1980; Scruggs, 1984).

According to the study coping strategies model, the deficit is strictly the ability to study properly; the student’s intellectual abilities are considered to be average or better. Poor study skills and the resulting reduced knowledge set the student up for impaired performance. Realizing this, the student becomes anxious about his or her performance because of the lack of preparedness (Benjamin, McKeachie, Lin, & Holinger, 1981;
Culler & Holahan, 1980; Hunsley, 1987). It is further postulated that a performance failure will be internalized by the student, and experienced as either a lack of effort, a result of using a faulty approach, or a lack of ability. If the student believes it is a lack of effort, or a result of using a faulty approach, then guilt can result. However, if the student believes that they simply lack ability, the consequence may be shame. Evaluative appraisals will likely influence future testing conditions, as it is believed that test anxiety results from experiencing failures in the past and the student's belief that he or she is once again unprepared for the test (Culler & Holahan, 1980; Lin & McKeachie, 1970; Wittamaier, 1972). The results on study skills training have been mixed. Some studies have found that study skill training alone is not largely effective in reducing test anxiety, other studies have found study skills training to be effective (Altmaier & Woodward, 1981; McKeachie, Pintrich, & Lin, 1985). In line with many other research findings, Giordana, (2000) found that study skills training was effective at improving study skills but had mixed results on decreasing anxiety and improving overall academic performance.

The deficit models focus on the student's lowered ability to study properly and the resulting lack of knowledge that results in a poor performance. In these models, this pattern of poor performance can lead to feelings of inadequacy, which heighten the test anxiety in future testing situations. These models are contrasted to the information processing models, which focus more on the student's personal learning process.

**Information Processing Model**

In the information processing model, it is believed that test anxiety affects all three levels of learning: encoding, organizing, and retrieval (Benjamin, McKeachie, Lin, Holinger, 1981; Hembree, 1990; Russell & Lent, 1982; Russell, Miller, & June, 1975; Stober & Esser 2001). It is believed that the test anxious student is in a heightened arousal state at all times, knowing that they will be evaluated on their learning at some point, (Benjamin et al., 1981). The term encoding refers to the actual process of taking in the information; from listening, to processing what one heard, to taking notes on the information presented. Organizing refers to the process of reviewing and arranging the material, mentally or otherwise. Organizing also refers to how one stores the material, in memory, through notes and reviewing. Retrieval is bringing the information back when it is needed. In the example of a test, encoding would be listening to a lecture and taking notes, organizing would be the process of studying, and retrieval would be remembering the information learned, that is now being asked on the exam. Again, the research shows that test anxious individuals will have problems with all areas of the learning process as they remain in a heightened state of arousal (Benjamin, McKeachie, Lin, Holinger, 1981; Hembree, 1990; Russell & Lent, 1982; Russell, Miller, & June, 1975; Stober & Esser 2001).

**Inference hypothesis.** The inference hypothesis, which is also called the examination-taking coping strategies (ECS), blends the interference model and the information processing model. Here it is believed that the student knows the information, and has been able to learn the information, but is anxious during the exam and thus cannot retrieve the information. The primary component is how much the task irrelevant responses occur (Hembree, 1990; Owuegbuzie & Daley, 1996). It is further believed that
the task irrelevant responses can also affect the student's information processing abilities. As stated previously, the information processing model states that information or knowledge is processed in three distinct stages, encoding, storage, and retrieval (Dutke & Stober, 2001). These task irrelevant thoughts can also affect the student's ability to encode, ability to retain, store and retrieve from memory, and use logical rules and conceptual processes. (Benjamin, McKeachie, Lin, Holinger, 1981; Hembree, 1990; Russell & Lent, 1982; Russell, Miller, & June, 1975).

Cue utilization theory. Another theory that is in line with the information processing, or cognitive processing, aspect of test anxiety is the cue utilization theory. This theory states that the circumstances that encourage high levels of stimulation (such as an exam) lead to a decrease in the assortment of cues that the individual has access to; this will decrease the student's organization and retrieval abilities, and ultimately can lead to a lower exam performance due to organization, processing, and retrieval failures (Cassady & Johnson 2002).

Working memory. Another potential explanation for the problems that test anxious students face is limited working memory. Working memory is typically depicted as a system that stores, processes, and allows for the mental manipulation of information (Oberauer, 2002). It has been determined that there are three main functions of working memory: (a) memorizing something briefly for later recall, (b) holding limited amounts of information for ongoing cognitive processes, and (c) holding onto one “chunk” of information that is selected to be the next cognitive operation, this is known as the focus of attention (Oberauer, 2002). It is believed that the available space in working memory is taken up by worry and task irrelevant thoughts; space that could otherwise be used in recalling, retrieving, or manipulationg information for the test. This makes retrieval of the information impossible. The space available in working memory is limited; it can hold only one chunk of information. If the information chunk held in working memory is a task irrelevant thought, i.e., “I’m going to fail,” retrieval will be difficult if not impossible for as long as that chunk is present. Highly test anxious people have large numbers of task irrelevant thoughts that continually occupy their working memory (Eysenck, 1985; Eysenck & Calvo, 1992, Oberauer, 2002).

Task irrelevant thinking permeates the information processing theories. These theories discuss the three levels of learning, and how test anxiety can affect learning that is to occur at those levels. These theories also recognize the interference perspective that test anxiety produces the task irrelevant thoughts, which take up available space, and distract the learning process at the encoding, storage, or retrieval levels.

Other Theories of Test Anxiety

Intelligence. Many studies have found a significant relationship between test anxiety and intelligence. Nyland et al., (2000) reported on Kenekar's 1977 findings that test anxiety greatly impacts the performance of students with lower ability (as defined by intelligence), whereas anxiety showed no effect on the performance of students with higher ability. McCann & Meen (1984) found that high anxiety was negatively correlated with achievement in a lower ability group, whereas anxiety and achievement were positively correlated in the high intelligence group. Other studies also report finding significant negative correlations between test anxiety and IQ, and test anxiety and
academic achievement (Cassady & Johnson 2002; Hembree, 1988; Hill & Wigfeld, 1984). The Hembree study reviewed the earlier findings of Mandler & Sarason (1952) and Sarason, Mandler, & Craighill (1952), which showed low test anxious students scoring higher on intelligence tests. They subsequently found that the low test anxious students were less distracted with personal preoccupations and could focus on the task at hand. Additionally Hembree (1990) examined the various studies for correlations between IQ and test anxiety and found the correlation between intelligence and test anxiety was significant (-0.23) for grades three through post secondary school, indicating that lower intelligence is associated with test anxiety. However, it must be remembered that IQ is measured by testing. Further analysis indicated an approximate six-point disadvantage for the test anxious students.

Expectancy theory. Several theorists suggest that Expectancy Theory can be applied to academic learning and test anxiety. Expectancy theory states that individuals behave in particular ways based on their expectations that their efforts will result in favorable outcomes for them. Expectancy theory also influences the person's effort in that the person must believe that they can effectively perform the behavior. If the student does not believe that they can achieve academic success they may not put in the requisite effort, and may therefore actually expect worse results. It has been found that when a person believes that they can handle the problems and challenges on the test they are more likely to feel hopeful and optimistic about the exam (Hancock, 1994; Howard, 1989; Wigfeld, 1994).

Expectancy is influenced by and influences both academic achievement and self-efficacy. It is largely believed that test anxiety can be influenced and exacerbated by previous failures; which largely affects a student's academic self-confidence and expectations for success. If the student believes that he or she has little ability to control the outcome of the evaluative situation test anxiety is more likely to come about (Smith, 1991; Smith & Ellsworth, 1987).

Personality. Several researchers have also found a positive relationship between perfectionistic personality traits and test anxiety (Onwuegbuzie, 1998; Kramer, 1988). Research shows that students who set high personal standards expect perfection become afraid that they will be unable to meet their own standards. Thus, even though they may be adequately prepared and have the information and the intelligence to do well, the evaluative situation becomes very threatening (Einat, 2000; Lufi, Oksaha, & Cohen, 2004). It is documented that higher levels of evaluative threat can increase test anxiety and decrease performance (Hancock, 2001; Stipek, 1998).

Evaluative threat. Some theories have evaluated the level of threat in the classroom, task complexity, and the importance of the task to determine their roles in test anxiety. An instructor's evaluative practices can influence students' achievement by increasing the level of debilitative test anxiety. It has been found that high evaluative threat brought about higher levels of test anxiety and lower levels of performance in students with even mild levels of test anxiety (Hancock, 2001; Stipek, 1998). It has also been found that students who report high levels of test anxiety do not necessarily achieve at a lower level than students with low test anxiety, and may in fact only do worse on exams when the students believe that the evaluative threat is high, or when success and failure are highly relevant; as is the case in high stakes testing (Hancock, 2001; Helmke, 1988; Zatz & Chassin 1985). If the task is not seen as relevant or important to one’s
goals or one’s future one may not experience any emotional disruption (Schultz, & Davis, 2000; Smith, 1991; Smith & Ellsworth, 1987). Hancock (2001) reported that highly test anxious students are more sensitive and easily influenced by their environment. It has also been found that test anxious students tend to perform better in classrooms that are supportive and assignment-oriented, highly ordered, and self-paced (Domino, 1974; Sarason, 1972; Tobias, 1980). Task difficulty may also play a crucial role in the effects of test anxiety. If the task is less complex, the test anxiety may not affect performance. Some studies have found that test anxious students show performance deficits exclusively in intricate or difficult tasks (Mueller, 1992; Zeidner, 1998), while others state that perceptions of test difficulty are related to the anxiety the student is experiencing regardless of the actual test demands (Everson, Tobias, Hartment, & Gourgney, 1993; Hembree, 1988; Hong & Karstensson, 2002).

The various theories try to answer the questions that test anxiety raises: what happens, how does it happen, and why does it happen? The interference models and the deficit models seem to be the predominant theories in the field today. Alternative test anxiety models have emerged, though they all seem to have commonalities with the two predominant models. For example, the intelligence theory is similar in nature to the learning deficits model, and the expectancy theory merges both the intelligence theory and the learning deficit model. Each of the models discusses, to a certain extent, the students' perceptions, attributions, thoughts and attitudes. Each of these traits is related to task irrelevant thoughts, which take up available space and impede learning and retrieval. The task irrelevant thoughts produce anxious cognitions, and the body responds to the anxiety, which further exacerbates the cognitive component, creating more task-irrelevant thoughts, in a cycle that can lead to lowered achievement and, subsequently, lowered self-efficacy. It seems plausible that changing the students' physical anxiety response and cognitions would break this cycle and allow the students to focus on the test and relevant thoughts for the task at hand.

**Correlates of Test Anxiety**

The ramifications of test anxiety are far reaching and can be devastating. High levels of test anxiety are associated with lowered self-esteem and self-efficacy, poor reading and math achievement, failing grades, pessimistic attitudes about school, and a profound fear of failure (Bryan et al., 1983; Sarason, 1972). A distinct relationship exists between test anxiety and academic performance; it has been reported that children who experience high levels of test anxiety were often up to two years behind their non-test anxious peers in basic reading and math skills (Bryan, Sonnfeld, & Grabowski, 1983; Guttman, 1987; Hill & Sarason, 1966; Plass & Hill, 1986; Zatz & Chassin, 1985). There is also a relationship between test anxiety and harmful intrapersonal and interpersonal behavior patterns (Hill & Eaton, 1977; Sarason & Koenig, 1965; Sarason & Paloia, 1960; Wine, 1971). Test anxiety typically manifests around second grade and above, which indicates that is a conditioned response to testing; these children learn to fear evaluative situations. Certain factors can predispose a student to test anxiety. Test anxiety is consistently more prevalent in females than males, Hispanics than Caucasians, and in African Americans than Caucasians until high school, where it levels out. Test anxiety is also related to ability level, the greater the student's ability the less likely they are to
experience test anxiety. Students with test anxiety typically have lower-self esteem, less self-acceptance, and less self-control than their non-test anxious peers, have a more external locus of control (they feel controlled by forces outside of themselves), and have a higher need for achievement in the later high school years. However, this need for achievement was not found to be significant for the college age population. It has been found that test anxious students spend more time taking the test and may therefore be subject to test fatigue. It has also been found that test anxious students spend more time studying for exams; however, their expectations for success are consistently lower, despite the time spent studying. One possible reason for the increased study time may be that these students are experiencing interference, due to the test anxiety, during the encoding and storage processes, which results in inefficient and time consuming studying (Hembree, 1988; Hill, 1972; Sarason, 1980; Speilberger, Anton, & Bedell, 1976).

Another important factor that can predispose a student to test anxiety is the presence of a learning disability. Students with learning disabilities also experience many of the other traits that predispose one to test anxiety (Bryan, Sonnefeld, & Grabowski, 1983; Hill, 1972; Lufi, Okasha, & Cohen 2004; Rizzo & Zabel, 1988, Swanson & Howell, 1996).

**Learning Disabilities: An Overview**

Two to ten percent of the population is affected by a learning disability (Lufi, Okasha, Cohen, 2004) and it is estimated that 5%, or more, of school age children have a learning disability (Lerner, 1997). Students with a learning disability do not effectively access their intellectual abilities (Bos and Sanders 1990; Borowski et al. 1989; Swanson 1990). These students have difficulty tapping into their potential or showing their potential for many reasons. It is thought that students with a learning disability have difficulty performing mental manipulations on information, such as organizing information or integrating new information. These students are believed to struggle with all areas of the learning process, and most areas of memory; from effective encoding, to storage, and retrieval (Swanson, 1982, 1983, 1993). It is also believed that students with a learning disability have difficulty tapping into and organizing certain self-regulating cognitive activities while trying to learn or solve problems. These troublesome cognitive activities have been identified as "checking, planning, monitoring, testing, revising, and evaluating," (Bos and Sanders, 1990; Brown and Palincsar 1988; Pressley, Johnson, & Symons, 1987; Pressley, et al. 1989). Not only do they struggle to encode, learn, and remember information, they also struggle to regulate their behavior and attention, which for many typical students is a relatively automatic process (Teglasi, Cohn, Meshbesher, 2004; Bargh & Ferguson, 2000; Lewiski, Hill, & Czyewska, 1992).

**Information Processing**

While individuals with a learning disability look similar to their non-learning disabled peers on sensory memory tasks, they look vastly different on both short-term memory and working memory. They have difficulty encoding information in short term memory, as they have difficulty mentally manipulating the information. Specifically, they have difficulty programming the information and ordering the information so that it can be reduced and stored as smaller, retrievable, units (Torgeson et al, 1991). Research
is unclear regarding whether the problem is the capacity to process the information, the
capacity to store the information, or a combination of these two factors (Swanson, 1993).
Several research studies have identified certain short-term memory strategies that are
deficient in students with a learning disability, including: chunking, clustering, the use of
mnemonics, and coding (Pressley, et al. 1989; Sruggs and Mastropieri 1989; Swanson,
Cooney, and Overholser 1989; Scruggs et al. 1987). Other memory strategy difficulties
identified in the research are rehearsal and elaborative processing. Torgeson and
Goldman (1977) found that non-learning disabled students had more lip movements
during memorization than their peers with a learning disability, indicating a greater
quantity of rehearsal in students without an learning disability. Gelzheiser et al, (1983),
and Swanson (1983) discuss the difficulties that students with learning disabilities have in
elaborating information and developing organizational strategies to deepen understanding
and improve learning.

Working memory. Working memory is also a problem area for individuals with a
learning disability. Working memory simultaneously processes (understanding the
information and combining the information with previously stored information) and
stores information. Alternatively, short term memory is only concerned with storage of
information (Dutke & Stober, 2001; Swanson, 1993). Daneman and Carpenter (1980)
determined that the working memory of students with a learning disability is not as
effective at comprehension and retention as the working memory of their non-learning
disabled counterparts.

Long-term memory. Long term memory is the permanent store house of
information and is certainly affected by the other three memory systems. Literature
suggests that storage and retrieval deficits are the major limitations for students with a
learning disability, and account for the majority of discrepancies between the two groups
of students (learning disabled and non-learning disabled). Students who have a learning
disability tend to conduct less comprehensive and effective searches. They also do not
store information as comprehensively, nor do they rehearse the storage as much.
Students without a learning disability tend to store with both visual and verbal clues,
ultimately facilitating retrieval. Individuals with a learning disability fail to use both
types of clues when storing information in long term memory. Additionally, "several
information processing components are problems and tend to interact to exacerbate the
memory problems experienced by students with learning disability, thus preventing these
students from reaching their intellectual potential." (Wachelka & Katz, 1999)

One theory used to address the learning difficulties experienced by students with
learning disabilities is the information processing theory (IPT), which addresses the steps
that are taken from stimulus to response that change, store, input, and later use the
information from the stimulus. IPT discusses the four types of memory: sensory
memory, short-term memory, working memory, and long-term memory. Research
suggests that individuals with and without an learning disability do not differ in their
sensory memory capability, except perhaps in the time it takes them to retrieve the
memory they have successfully encoded from sensory memory. Students with a learning
disability tend to take longer in the retrieval of the information (Swanson, 1993; Elbert,
1984; Manis, 1985). However, sensory memory is likely the only memory system in
which students with a learning disability do not differ significantly from their non-
learning disabled peers.
**Psychosocial Characteristics.**

In the psychosocial area, students with learning disabilities reportedly have lower self-esteem, and have greater difficulty adjusting to both personal and academic situations than their non-learning disability counterparts (Brinkerhoff, Shaw, & McGuire, 1993; Hill, 1996; Stolowitz, 1995). Students with a learning disability also struggle with motivation, attributions, self-awareness, and self-monitoring; limitations that can lead to further academic problems (Borkowski, Carr, Rellinger, & Pressley, 1990; Borkowski, Johnston, & Reid, 1986; Borkowski & Muthukrishna, 1992; Hall, Spruill, & Webster, 2002). However, Hall, Spruill, and Webster (2002) suggest that students with a learning disability have a greater need for achievement and show higher initiative than their non-learning disabled peers. It may well be that the struggle they have endured throughout their academic career has taught them what is required, and shown them that they are rewarded only when they have worked hard. Greenbaum et al, (1995) discovered that 37% of a sample of college students with a learning disability believed that the most helpful factor in their academic success was their own resolve and determination. Other studies mirror these findings, showing that student's self-awareness and belief in their abilities is often instrumental in determining academic success; specifically for students with learning disabilities (Gerber et al., 1992; Speckman, Goldberg, & Herman, 1992; Speckman et al, 1993). Low self-efficacy, low expectancy, and negative attributions have been repeatedly shown to undermine academic success (Butler, 1999; Butler, Elashuk, & Poole, 2000.). It is believed that students with a learning disability have both a lower general and academic self-concept due to their social and learning difficulties. One such study found that students with a learning disability scored lower on both a measure of general self-concept and academic self-concept than their non-learning disabled peers (Elbaum & Vaughn, 2003). This lowered self-concept and lowered expectancy of success can place the student with a learning disability at an even higher risk for test anxiety.

**Learning Disability and Comorbid Test Anxiety: The Unique Challenges**

Students with a learning disability are at an increased risk for test anxiety and test anxiety symptoms, and often have higher levels of test anxiety than their non-learning disabled peers (Bryan, et al, 1983; Hill, 1972; Hoy et al., 1997; Rizzo & Zabel, 1988, Swanson & Howell, 1996). These students are concomitantly at an increased risk for scholastic failure due to their learning difficulties. Scholastic failure can in turn increase test anxiety and its symptoms (Bryan, Sonnefeld, & Grabowski, 1983; Hoy, et al. 1997; Nicaise, 1995; Strumph & Fodor, 1993; Swanson & Howell, 1996; Wachelka & Katz, 1999). Swanson and Howell (1996) found that for test anxious students with a learning disability, the highest correlation was between test anxiety and task irrelevant thoughts (.580). Thirty-two percent of the variance in test anxiety was accounted for by task irrelevant thoughts. Not only are students with a learning disability susceptible to interference, they may also be prone to working memory problems, may have study skill troubles, and be less test savvy than their non-learning disabled peers. These situations can all lead to decrements in self-efficacy and expectancies.
For many students with a learning disability the academic challenges are overwhelming and many high school students with a learning disability choose not to go on to college. The Wagner et al. (1991) longitudinal study found that it is far less likely that a student with a learning disability will attend college than typically achieving students. Their study found that only 14% of students with a learning disability went on to college, whereas 53% of typical students attended college. Students with a learning disability that do attend college often have lower graduation rates. Rath & Royer (2002) found that only 24% of the diagnosed learning disabled student population graduated after six years. The general student population enjoys a nearly double, 43%, graduation rate for the same six-year period.

In the past forty years, much has been researched and written about test anxiety, and the treatment of test anxiety, in the typical student population; however, there has been a paucity of research when it comes to test anxiety and the population of students with learning disabilities (Wachelka & Katz, 1999). The presence of the learning disability, which has its own unique challenges, presents many difficulties for these students to overcome. Where the student may be able to overcome the learning difficulty with an inordinate amount of effort or tutoring, he or she may still not be able to perform satisfactorily on the exam because of the underlying test anxiety.

Treatments for Test Anxiety

Over the years, many studies have evaluated the efficacy of interventions for test anxiety. There tend to be two generally accepted types of interventions for test anxiety: behavioral treatments and cognitive treatments. Behavioral interventions are consistent with the interference and information processing models of test anxiety, while the cognitive treatments are consistent with the deficit model of test anxiety. While there is empirical support for both cognitive and behavioral interventions, the treatment of choice for test anxiety, especially in the college level population, is a behavioral approach (Hembree, 1988). Therefore, behavioral interventions (specifically systematic desensitization and relaxation training) are the focus of this study.

Behavioral Treatments

Many studies report that the treatment of choice for test anxiety is a behavioral approach. King and Ollendick (1998) discuss two separate meta-analyses conducted in 1985 and 1995, on a total of 258 anxiety treatment studies. They concluded that behavioral treatments proved more effective than non-behavioral treatments regardless of client age, therapist experience, or treated problem. Hembree (1988) further outlined six types of treatment programs for test anxiety, and examined their effectiveness. He found all of the behavioral treatments to be successful in lowering test anxiety. Systematic desensitization is empirically well-supported and widely accepted as a treatment for anxiety. Many studies using systematic desensitization in the treatment of test anxiety show successful outcomes (Hembree, 1988; Gonzalez, 1995).

Hembree (1988) showed that systematic desensitization was the most widely used treatment for test anxiety and was also the most effective for college level students, though it was significant for all grade levels. Additionally, Gonzalez (1976) found that
students who had a large reduction in test anxiety, through systematic desensitization, and who had good study habits, showed substantial academic improvement. The second most effective behavioral treatment was relaxation training, and it was also effective for all grade levels. The behavioral treatments clearly target the emotionality symptoms, but the treatment effects seem to generalize to the cognitive or worry symptoms as well (Hembree, 1988, Zettle 2003).

Cognitive, Physical, and Performance Effects

It is also important to determine whether behavioral treatments have an effect on GPA and test performance. Hembree (1988) found that both the behavioral and the cognitive-behavioral treatments, with the exception of relaxation training alone, were effective in improving test performance. The same results were found for GPA improvement. The behavioral treatments, with the exception of relaxation training alone, were all effective in improving GPA. It was also found that the behavioral treatments were the most effective at reducing the physical and cognitive symptoms (emotionality and worry). This finding again supports the belief that test anxiety is behavioral in nature.

Behavioral test anxiety treatments also decreased general anxiety, trait and state anxiety, the bodily manifestations of anxiety, and the task-irrelevant thoughts during the evaluative situation. Zettle (2003) found that, when compared to an alternative treatment approach, systematic desensitization was the only treatment that significantly reduced trait anxiety. Hembree (1988) found that the results for systematic desensitization were durable up to a period of 60 weeks post treatment. In his study, the students’ GPA, test performance and test anxiety levels all stayed consistent with the end of treatment measures.

Systematic Desensitization Overview

Systematic desensitization has routinely been found to be one of the most successful behavioral treatments of anxiety (Zettle, 2003, Wolpe, 1958, Suinn, Edie, & Spinelli, 1970). Hembree (1988) found that systematic desensitization was the most common treatment choice, largely because it is effective at decreasing the level of test anxiety, and improving the students academic performance. Because systematic desensitization is considered the treatment of choice for test anxiety, and specifically for test anxiety in a college population, it will be the focus of this study and will therefore be described in more detail.

Systematic desensitization was devised to hinder anxiety by calming the body through relaxation. Systematic desensitization has several components; included in the procedure are relaxation training, anxiety hierarchy construction, and finally combining the relaxation training, with progression through the hierarchy (Bourne, 2000; Zeider, 1998). Counterconditioning, extinction, and skills training are all potential explanations as to why systematic desensitization works (Zeidner, 1998). It has been found that systematic desensitization is equally effective applied to groups or individuals (Deffenbacher & Suinn, 1988; Zeidner, 1998), with an individually constructed hierarchy.
or a generic group hierarchy constructed from various individual ones (Emery & Krumboltz, 1967; Zeidner, 1998).

**Relaxation training.** Though there are several relaxation techniques that can be used, progressive muscle relaxation (PMR) is one of the most routinely chosen relaxation trainings used in systematic desensitization (Deffenbacher & Suinn, 1988; Zeidner, 1998). PMR targets alternating major muscle groups through a series of tense and release cycles. The intent is to teach the subject how to relax, and how it feels to relax deeply. The muscles are tensed for a period of seconds and then relaxed for a longer period of time. The muscle groups are targeted one at a time, i.e., first the quadriceps, then the gluteus maximus, followed by the lattisimus dorsi. During the relaxation phase of the cycle the subject is encouraged to allow the muscle group to completely relax, and to become aware of any resistance to the relaxation response. Additionally, a relaxing image is constructed. This image is a relaxing, tranquil, and peaceful place or time in the person's life (Bourne, 2000; Deffenbacher & Suinn, 1988; Zeidner, 1998).

**Anxiety hierarchy construction.** The subject must construct an anxiety hierarchy for use during the systematic desensitization. The anxiety hierarchy is typically eight to twenty items in length (Zeidner, 1998). The subject lists test related situations in reverse order, from least anxiety producing to most anxiety producing. The first few items should illicit only minimal anxiety and the highest anxiety producing items will be at the end of the hierarchy. The subject will imagine the situations listed on the hierarchy, in order, while in a relaxed state.

**Systematic Desensitization Procedures**

After the subject has been trained in a relaxation technique, which is most often PMR, (Deffenbacher & Suinn, 1988) the client will begin the actual systematic desensitization procedure. The subject will achieve a relaxed state, and then exposure to the hierarchy items will begin. The first few items typically illicit little anxiety, thus the relaxation response is likely to be more powerful than the anxiety response (Deffenbacher & Suinn, 1988; Zeidner, 1998). This allows the subject to practice the systematic desensitization, and start the exposure off in a safe and successful manner. The subject will then progress through the hierarchy with the goal of staying in a relaxed state while the imaginal exposure takes place. If the subject becomes anxious, he or she should return to the peaceful, tranquil, relaxing image previously discussed (Bourne, 2000; Zeidner, 1998). Successful completion of the hierarchy is accomplished when the subject can proceed through each of the items on the anxiety hierarchy without becoming anxious.

**Summary**

Behavioral treatments, specifically systematic desensitization and relaxation training, are consistently shown to be the most effective treatment for test anxiety and are most consistent with the interference model of test anxiety. Test anxiety causes both physical and cognitive manifestations which prevent the student from performing at his or her true level. Therefore, it can be inferred that both the test anxiety and its treatment are behavioral constructs, and that the interference model of test anxiety is most accurate.
(Hembree, 1988). This indicates that if test anxiety can be reduced, academic performance will improve, as the student will be able to process the information at all levels of learning, which will enhance learning and retrieval. This approach of combining systematic desensitization and progressive muscle relaxation has not been validated on a population of students with learning difficulties; however, it is hypothesized that given the students’ unique characteristics and the behavioral construct of test anxiety the students with learning difficulties would respond well to this treatment. Additionally, the process of change during the test anxiety treatment program has not been examined. It is believed that by using a case study approach the course of treatment can be analyzed to determine when critical changes take place.
CHAPTER 3

METHODOLOGY

This methodology has been divided into the following sections: Purpose of the study, population, participants, research design, the case study as a research design, data analysis, variables, instrumentation, procedures, and limitations.

Purpose of the Study

The purpose of this exploratory study was to obtain a comprehensive picture of the process of test anxiety and test anxiety treatment. The current study examined when in the treatment process various measures of interest (test anxiety, state and trait anxiety, distress while studying, efficiency while studying, reported feelings of academic self-efficacy, hours spent studying, and grade point average) changed, and how they changed, for these selected individuals. Additionally, this study looked at how select participants with slight variations in cognitive abilities, disability, and level of test anxiety responded to the treatment program, and how durable the treatment program was for these individuals. The current study is a case study analysis allowing both the process of an empirically supported test anxiety treatment program and the outcomes to be studied in depth. This study also sought to determine if the process of implementing the treatment with a student with a learning difficulty was different than the process used with a typically achieving student.

There is currently no research that shows that the test anxiety treatment results for the typical student population will generalize to a student population with learning difficulties. This study evaluated whether combining relaxation training and systematic desensitization would be effective with students with learning difficulties. Further, the treatment program's durability was examined. This study will contribute to the understanding of the process of test anxiety treatment, as it explored individual similarities and differences in test anxious students. This study will also serve to contribute to the largely unexplored relationship between learning difficulties and test anxiety and the test anxiety treatment of combining Progressive Muscle Relaxation (PMR) and Systematic Desensitization (SD).

Population

The population from which the case studies were chosen consisted of adult learners from Florida State University and Tallahassee Community College, who self-referred, were referred by their parent(s), or were referred by an academic advisor to the Adult Learning and Evaluation Center (ALEC) for psychological and educational testing due to academic difficulties, or for test anxiety treatment. These students could have potentially been undergraduate or graduate level students, male or female, and of varying ethnic backgrounds.
Each student evaluated for a learning disability was given a questionnaire and subsequently interviewed by the Clinic director and the examiner. The students were asked various questions about academic difficulties, special areas of concern, (both academic and personal) and academic history. In addition to the questionnaire and interview, each subject was given the Wechsler Adult Intelligence Scale (WAIS-III), Woodcock Johnson Tests of Cognitive Abilities (WJ-COG III), Woodcock Johnson Tests of Achievement (WJ-ACH III), and the Learning and Study Strategies Inventory (LASSI). Upon completion of the testing, the student's results were compiled and analyzed prior to presenting the results to the student. During the presentation of results, if test anxiety was determined to be a problem, the examiner would recommend that the student seek test anxiety help through various locations on campus. All alternatives were made known to the student, with no special emphasis made on the Adult Learning and Evaluation Center's treatment program. Students who self-referred for test anxiety treatment underwent an informal interview and were given the Test Anxiety Inventory.

Sample

The case studies consisted of a convenience sample of nine college students, of varying level in college, both males and females, of varying cognitive abilities, and of various ethnic backgrounds. Three of these students had a diagnosed learning disability (learning difficulty, LD), which by the Association on Higher Education and Disability (AHEAD) standards is a discrepancy of one standard deviation (15 points) between IQ and achievement score, and a one standard deviation (15 points) between IQ and cognitive score. Two of these students had been referred to ALEC for testing, but not diagnosed with an LD, and four of these students were non-LD students who had been referred to ALEC exclusively for test anxiety treatment. No students with a diagnosis of ADHD were selected for participation in this study. Students with ADHD were eliminated from the case study pool due to the fact that they may have been undergoing other treatments that could have confound the results of the treatment program, e.g., ADHD coaching or medication. Students with ADHD were not turned down for treatment, but they were not considered for inclusion in the study. Students registered for treatment on a first-come, first-serve basis, until this author had reached the allocated number of clients for that semester; any remaining interested participants were placed on a wait-list, and received treatment the next semester if they were still interested.

Research Design

The research design was multiple case studies with a multiple time series design. Four measures of test anxiety and state and trait anxiety were taken: baseline (first session), mid-point (fifth session, after PMR but before SD is introduced) at the end of treatment (ninth session, after PMR and SD), and six-months after completion of treatment. Weekly measures of Degree of Competency (DOC), Subjective Units of Distress (SUD), Subjective Units of Efficiency (SUE), and hours studied were taken for a total of eight measures of each, four prior to the full intervention beginning (PMR only until week five) and four after the full intervention has begun (PMR and SD). The time series design allowed the researcher to examine changes over time in Test Anxiety.
Inventory (TAI) scores, State and Trait anxiety Inventory (STAI) scores, DOC ratings, SUD ratings, SUE ratings, and hours studied in each individual, and then in the cross case analysis, across individuals. GPA was examined for each subject the semester before treatment, the semester of treatment, and the semester following treatment.

Case Studies as a Research Method

A case study is an empirical investigation that examines a contemporary phenomenon within its real-life context, allowing an in-depth look at the phenomenon (Babbie, 1995; Merriam, 1998; Yin, 2003). When studying a process, the behaviors in question cannot always be manipulated, as is the case in this exploratory study. The researcher in the current study could not control when the participants’ exams were given, how important, or how heavily weighted the tests were, the competitive nature of the classroom, or whether a learning difficulty was present in the student. Situations like these, where the behaviors cannot be manipulated, are well suited for a case study design. Additionally, topics that can best be understood within the context of their natural surroundings are often believed to be best suited for case study research (Babbie, 1995; Yin 2003).

Babbie (1995), Merriam (1998), and Yin (2003) describe many instances in which the case study design is the most appropriate research design, allowing the most comprehensive look into a particular research phenomenon. For example, Merriam (1998) discusses using the case study research method for experiments that are focused on process, which she defines as a comprehensive monitoring and subsequent description of the construct, population, treatment implementation, and outcome. Yin (2003) describes how the case study allows an in-depth look at a phenomenon and allows the researcher to examine the process of a phenomenon and still maintain “the holistic and meaningful characteristics of real-life events.” Yin (2003) also points out that many researchers successfully use case study research in all phases of research, with results that are generalizable to theoretical positions, in much the same way that other experiments can be. Objectivity, precision, and analytical issues are all issues that can be addressed and controlled for a priori with the use of systematic procedures and awareness of any biased views, to help limit bias and prevent results from being skewed. However, it is important to note that other experimental procedures can also have these same biases (Yin, 2003).

In the current research, the case study design supported an in-depth examination of the process of test anxiety and its treatment, in a natural school environment, and allowed this same level of insight into multiple participants with varying abilities, disability, and test anxiety levels. Case study research was quite appropriate for examining the construct of test anxiety as it applied to these select individuals, for studying how varying abilities affect test anxiety, and exploring how the outcomes were achieved in each of the participants. Additionally, the use of multiple cases allowed a broader examination of the construct of test anxiety and its treatment, especially with students of varying abilities.

These multiple cases allowed the researcher to compare the findings across the cases in a cross-case analysis. Explanations that spanned the various cases enhanced the generalizability of the research findings. Generalizations were made in these case studies, as they are in other forms of qualitative research, through the examination of
patterns and themes that emerged from the data. In this study patterns were seen through individual examination of both dependent variables and case studies, and a cross-case analysis of the data. These analyses looked for commonalities, which provided certain indicators about the constructs of test anxiety and test anxiety treatment, in students with and without learning difficulties, that may be generalizable not just to theory, but also potentially to populations. This level of generalizability is similar to other single experiments whereby the generalizability is constrained by the particular treatment conditions and the particular treatment group.

Case studies have contributed greatly to psychology as a discipline through the exhaustive and concentrated study of the individual that they allow, which makes them particularly well suited to study the development and use of interventions (Kazdin, 1981, Kazdin 1980). The goal of a case study is the same as the goal of other types of studies; that is to be able to make valid inferences. This can be done in a case study if the methodology allows for systematic data collection and unbiased assessment to obtain the best information possible. When the case study includes assessments on several occasions, this strengthens the study’s methodology. As in any other type of study, these multiple assessments can be used to draw conclusions and detect patterns, which can be used to assess change and identify or rule out other factors that may be responsible for the changes.

Data Analysis

The purpose of this exploratory study was to provide an understanding of and a description of both the students’ academic and anxiety experiences in the context of the test anxiety treatment program while it obtained a comprehensive look at the process of test anxiety and test anxiety treatment. The qualitative measurements reported were derived from semi-structured interviews, case notes of the researcher on observations and impressions, and self-report measures of the participants. This research was designed to be deductive in nature, and as such began with an examination by dependent variable to see how, and for whom, the process measures changed. These generalized findings were followed by examination of the individual case studies on each measure taken and the demographic data obtained. This individual analysis was viewed in light of the more generalized findings and the patterns and themes that emerged from the data and cross case synthesis, where the data was looked at for similarities and differences among the case studies and the variables.

Each case study began with the answers to a series of standardized questions and concluded with individual nuances reported from observations, interviews, and case notes of the researcher. The cases were then cross-analyzed to determine any commonalities or distinct differences. These commonalities helped identify any patterns or trends that were present. A summary of the standardized questions for each case study are listed in Appendix G.

Variables

The independent variables addressed in the case studies were student status (learning difficulty or non-learning difficulty) and time (pretreatment, fifth session, post-
treatment, and follow-up). The dependent variables were levels of test anxiety, state and or trait anxiety, degree of competency (DOC), subjective units of distress (SUD), subjective units of efficiency (SUE), and grade point average (GPA). Test anxiety was measured by the Test Anxiety Inventory (TAI), and was treated as a continuous ordinal level variable (raw scores ranging from 20-80). State and trait anxiety were measured by the State and Trait Anxiety Inventory (STAI) and were treated as a continuous ordinal level variable (raw scores ranging from 20-80 for state anxiety and 20-80 for trait anxiety). Degree of competence, subjective units of distress, and subjective units of efficiency are subjective reports that were also treated as continuous ordinal level variables with terms ranging from 0 to 10. GPA was a continuous interval level variable with terms from 0.0 to 4.0.

Instruments Used in This Study

Test Anxiety Inventory

The Test Anxiety Inventory (TAI; Spielberger, 1980) is a one-page self-report scale containing twenty items with Likert scale responses. Participants are asked to report how frequently they experience specific symptoms of anxiety before, during and after examinations. The scale offered four possible responses, (1) "Almost Never," (2) "Sometimes," (3) "Often," and (4) "Almost Always." Three scores are obtained from the TAI. A total (overall) Test Anxiety (TAI) score is calculated and then two subscale scores, worry (TAI/W) and emotionality (TAI/E), are. The TAI appears to have good face validity, each question uses the words test or examinations, each question lists a characteristic that seems a typical anxious reaction to tests/examinations, and it lists both physical symptoms and emotional symptoms. The reported measures of reliability are good. Test-retest reliability coefficients are high, and persist with a time lapse of up two weeks to six months. The shorter time periods show a reliability coefficient of .80 and .81; however, the longest time lapse showed a drop in the reliability coefficient to .62. To determine internal consistency reliability, Cronbach's alphas were calculated for each of the normative samples and the subscales. For the overall TAI scale, the alphas were consistently high for both the female sample and the male sample at .92 and higher. The two subscales, TAI/E and TAI/W had similarly high alphas of .90 and .88. These numbers are considered satisfactory for internal consistency.

The TAI total score was compared to six other measures of anxiety to assess concurrent and construct validity. The Test Anxiety Scale (TAS; Sarason 1978), Worry and Emotionality Questionnaire, (WEQ/W WEQ/E; Liebert and Morris', 1967), State-Trait Anxiety Inventory (STAI/T STAI/S; Spielberger, 1983), and a special situation with imagined testing while taking the STAI/S called Exam A/State. Correlations were all moderate to high with .54 for STAI/T being the lowest, and Exam-A/State being the highest at .86. The others are as follows: TAS .82, WEQ/W .73, WEQ/E .77, STAI/State .67, which are all indicators of good concurrent and construct validity. The TAI does not attempt to make predictions about behavior and thus criterion-related validity was not assessed.

The TAI was normed on 4-year college students, community college students and high school students (9th-12th grade); there was no norming sample that specifically took
into account students with learning difficulties. The norming sample of college students included 1,149 undergraduate students (654 males, 795 females) and 1,129 incoming freshmen (533 males, 596 females) from the University of South Florida. The community college sample included 320 students (136 males, 184 females) at Hillsborough Community College in Tampa, FL. The high school student norming population was 1,118 ninth through twelfth graders (527 males, 591 females) enrolled in public high schools in Florida schools.

State Trait Anxiety Inventory

The State Trait Anxiety Inventory (STAI; Spielberger, Gorsch, & Lushene, 1970) is a two page self-report comprised of two separate scales each containing twenty items with Likert scale responses. Participants are asked to report how they feel at that very moment (measuring state anxiety) and how they typically feel (measuring trait anxiety). The Trait scale offers fours possible choices (1) “Almost Never,” (2) “Sometimes,” (3) “Often,” and (4) “Almost Always.” The State scale also offers four choices, but they are worded differently (1) “Not At All,” (2) “Somewhat,” (3) “Moderately so,” and (4) Very Much so.” For both scales, low scores indicate less anxiety and high scores indicate more anxiety.

The STAI appears to have good face validity, each statement uses words that reflect feelings of anxiety or feelings of peace and ask for a determination of the individual’s leaning. The reported measures of reliability are good. Concurrent validity was obtained by comparing the State Trait Anxiety Inventory with other available anxiety scales. The resulting correlations were moderate ranging from .52 to .83. Construct validity correlations were also moderate ranging from .60 to .73. Test-retest reliability coefficients are high for the trait scale ranging from .73 to .86; however, the test-retest reliability coefficients for the state scale range from .16 to .54. Both the scales were reported as having high internal consistency, with the trait scale and state scales reporting a .90 and a .92 alpha coefficient, respectively, for the normative sample.

Subjective Units of Distress

The subjective units of distress is a self-report questionnaire (SUD; Kennedy & Doepke, 1999) that has been widely used in research to determine how distressed an individual is feeling in response to some stimuli. In this study the SUD was used to determine the amount of distress the participant felt, on a daily basis, in each of the classes he or she was taking. The SUD is a Scale ranging from 0-10, designed to tap into the student's perception of the distress they experience for each subject they are taking. A score of zero indicates total calm, no worries, no anxiety. Conversely, a score of ten indicates being completely distress and anxious.

Subjective Units of Efficiency

The subjective units of efficiency (SUE) questionnaire was developed by this examiner, and was based on the SUD scale, to determine how efficient the subject felt, on a daily basis, in each of the classes he or she was studying. The SUE is a Scale ranging
from 0-10, designed to tap into the student's perception of the efficiency of their studying. A score of zero indicates being completely overcome by task-irrelevant thoughts, often rereading the same material several times. Conversely, a score of ten indicates complete concentration, getting absorbed by the task at hand.

Degree of Competency

The Degree of Competency (DOC) questionnaire was developed by this examiner, and was based on the SUD scale, to determine how competent the subject felt, on a weekly basis, in each of the classes he or she was taking. The DOC is a Scale ranging from 0-10, designed to tap into the student's perception of their own competency, or their academic self-efficacy in each subject they are taking. A score of zero indicates being overwhelmed by the material, and a complete lack of academic self-efficacy. Conversely, a score of ten indicates total competency, feeling like an expert.

Grade Point Average

Each student's non-cumulative grade point average (GPA) for the current semester, the previous semester, and the subsequent semester when available, was collected. GPA was used as a measure of academic performance for the participants, and was used to determine if the treatment program affected academic performance, and if those effects were stable.

Hours Spent Studying

The hours studied was designed to capture the amount of time (reported in hours) that the student spent studying, with each course being reported separately, on a daily basis.

Procedures

Data collection for this study took place from the spring semester of 2002 until the summer semester of 2005. Prior to data collection, Institutional Review Board approval was obtained from the Florida State University Human Subject’s Committee (See Appendix A). Pertinent archival data located in the client files at the Adult Learning and Evaluation Center had been collected to obtain demographic information (i.e., age, race, gender, year in school, school attending), diagnosis (LD, ADHD, or no diagnosis) and psychological and educational test results (data from the interview and questionnaire).

Students who came to the ALEC to be evaluated for a learning disability were given a questionnaire and subsequently interviewed by the clinic director and the examiner. The clinic director held a Ph.D. in Counseling Psychology and School Psychology, and was supervised by two other licensed psychologists. The examiners were all advanced master's level and doctoral level students in the School Psychology program or advanced doctoral level students in the Counseling Psychology program. During the interview the participants are asked clarifying questions from the questionnaire about academic difficulties, special areas of concern, (both academic and
personal) and academic history. In addition to the questionnaire and interview, each participant was given the WAIS, WJ-III (Cognitive), WJ-III (Achievement), and the Learning and Study Strategies Inventory (LASSI).

The participants self-selected to attend test anxiety treatment. Students who seek psychological and educational testing at ALEC at FSU fill out a questionnaire that discusses test anxiety. If these students reported test anxiety as an issue, or scored high on the test anxiety portion of the LASSI, they were contacted via email and a follow-up phone call, regardless of LD diagnosis status. The test anxiety treatment program was discussed with them and they were given an opportunity to begin treatment. All clients who reported test anxiety as a problem were encouraged to seek test anxiety treatment. The examiner would recommend that the student seek test anxiety help through one of the various locations on campus. All alternatives were made known to the student, with no special emphasis made on the ALEC treatment program. The programs available included: the FSU ALEC test anxiety reduction group, relaxation training offered at the FSU Counseling Center, or the FSU Psychology clinic. Additionally, the test anxiety treatment program was advertised throughout the campuses of Florida State University and Tallahassee Community College, which opened the treatment program up to all students on both campuses.

An informed consent form and a semi-structured interview (an intake form) were completed for all students who seek test anxiety treatment (see Appendices A and B respectively). The informed consent explained the low-risk associated with test anxiety treatment, the voluntary nature of this treatment, what was involved in the treatment and the expected duration of the treatment. The interview (intake form) consisted of demographic data such as contact information, estimated GPA (which was later confirmed with the student's transcripts), age, race, gender, year in school, and school attending. At the time of intake the student was given a TAI, a STAI, several data collection sheets to track baseline data, and an anxiety hierarchy to complete. The student was also asked to record the number of hours that he or she spends studying, for each subject taken, everyday. Additionally the student was asked to subjectively rate their study experience in terms of subjective units of distress and subject units of efficiency. Degree of competence in each subject was rated each week. The daily and weekly data was collected throughout the treatment program (beyond baseline data), and was averaged into weekly ratings, for a total or eight measures for each participant of SUE and SUD. The DOC data was collected on a weekly basis, yielding eight degrees of competence measures. For each of these measures, four of the data collection points occurred before the beginning of the systematic desensitization and four occurred after. Additionally, the TAI and STAI were taken a total of four times (first session, fifth session after the PMR and before the SD, ninth session after the PMR and SD, and six-month follow-up). GPA was examined the semester before treatment, the semester of treatment, and the semester after treatment had been concluded. See Appendix C for a schedule of data collection.

During the nine-week program the students learned progressive body relaxation, developed a test anxiety hierarchy, and underwent systematic desensitization, based on the following nine-week schedule (See Appendix D for a detailed description of the treatment):

Week one: Built rapport; discussed anxiety hierarchy, and treatment goals
Week two: Reviewed anxiety hierarchy and ordered the hierarchy items appropriately (lowest to highest anxiety), discussed proper, deep diaphragmatic breathing
Week three: Began progressive muscle relaxation training and continued to practice breathing
Week four: Continued progressive body relaxation
Week five: Finalized anxiety hierarchy and began desensitization procedure combined with relaxation techniques
Week six: Continued desensitization procedure and relaxation
Week seven: Continued desensitization and relaxation
Week eight: Continued desensitization and relaxation
Week nine: Finalized desensitization and concluded treatment, set-up follow-up appointment for four weeks later.

Limitations

1) The sample was a convenience sample and many students who reported test anxiety as a debilitating issue choose not to undergo the intensive and time consuming test anxiety treatment protocol; therefore, the students who chose to participate may be inherently different than those who chose not to, and may subsequently limit the generalizability of the findings.
2) The case study design limited the generalizability of the findings.
3) The data collected was primarily self-report (mono-method bias). The TAI, STAI, DOC, SUD, and SUE are all subjective self-report measures that helped determine level of test anxiety, state and trait anxiety, feelings of competence, distress and efficiency in academic endeavors. The TAI and STAI were given three times, but the TAI was really the only measure of academic anxiety used (mono-operation bias) and only one form of measure (self-report, mono-method bias) was used. However, GPA is a measure that was used in the study, and it is distinctly not self-report, which is why GPA and not self-report of test grades was used.
4) GPA may not have been the best way to measure academic improvement (no immediate feedback) and it may have been an exceptionally hard semester or an exceptionally easy semester
5) Experimenter expectancy may have influenced the results obtained. However, standardized procedures were established to ensure that there was no deviation due to reactivity or individual differences of the participants.
6) Anxiety, test anxiety and state/trait anxiety were assessed frequently and, as a result, there may have been some test-treatment interactions. The participants may have provided certain responses on the subsequent inventories based on feedback provided on the previous inventories.
CHAPTER 4

RESULTS

The purpose of this study was to obtain a comprehensive picture of the process of test anxiety and test anxiety treatment. The current study examined when in the treatment process various measures of interest (test anxiety, state and trait anxiety, distress while studying, efficiency while studying, reported feelings of academic self-efficacy, hours spent studying, and grade point average) changed, and how they changed, for these selected individuals. Additionally, this study looked at how select participants with slight variations in cognitive abilities, disability, and level of test anxiety responded to the treatment program and how durable the treatment program was for these individuals. The current study was a case-study analysis.

This chapter presents the results of the study. The findings are also presented in a master chart that summarizes the data for the entire study (Appendix G), broken down by individual participant. In this chapter the dependent variables are examined first and then the nine individual case studies are presented in the order that the individuals were treated. As this study was interested in examining the process of test anxiety in these individuals and the description of these individuals’ test anxiety, qualitative measurements were used.

The qualitative measures were the semi-structured interviews that each client participated in, self-report measures of the participants, and the case notes of the researcher, which addressed observations and impressions. The self-report measures used were the Test Anxiety Inventory (TAI), the State Trait Anxiety Inventory (TAI), the Subjective Units of Distress (SUD) scale, the Subjective Units of Efficiency (SUE) scale, the Degree of Competency (DOC) scale, and the number of hours reported studying.

For each of the cases studied the same treatment pattern and time line were followed (Appendix C). That time line is as follows: Session one was an intake session where demographic and personal data were collected in a semi-structured interview, initial TAI and STAI measurements were taken, treatment procedures were explained, and data collection requirements were outlined. Data collection began immediately for the participants. Admission to their second treatment session was procured by turning in their first week of collected data. Therefore, session two aligns with data week one. Session two is also where the test anxiety hierarchy was constructed. Session three, where the instructing of PMR begins, aligns with data week two. Session four, where PMR instruction continues, aligns with data week three. Session five, where the second administration of the TAI and STAI are conducted, SD is started, and mid-terms are occurring for each of the participants, aligns with data week four. In session six the SD is continued, and it aligns with data week five. SD continues in session seven, which aligns with data week six. SD is typically finished with session eight, which aligns with data week seven. Finally, session nine, which is devoted to terminating treatment and conducting the third administration of the TAI and STAI, aligns with data week eight. The sixth-month follow-up occurs six months after the last session with the participant and involves the fourth administration of the TAI and STAI, a brief informal and unstructured interview, and a brief relaxation segment.
The results will be discussed first by examining the dependent variables providing a cross-case analysis. Each dependent variable will be looked at in turn to determine what affect, if any, the treatment program appeared to have on that particular variable across all participants. The results will begin with test anxiety as measured by the TAI; and trait and state anxiety as measured by the STAI, GPA, SUD, SUE, DOC, and hours studied. Following this, a look at the individual case studies will be conducted.

TAI

The Test Anxiety Inventory (TAI; Spielberger, 1980) measures academic anxiety. On this measure, participants are asked to report how frequently they experience specific symptoms of anxiety before, during and after examinations. In general, TAI scores improved over treatment (see figures 4.2 and 4.3), in that they reflected less test anxiety with each administration. Each participant’s ending TAI score was lower (indicating improvement) than their initial and mid-point TAI scores. Additionally, each participant’s follow-up TAI score was lower than their initial and mid-point TAI score. There were individual variations when it came to the treatment durability, though most of the participants showed improvement or consistency of scores between the end-point TAI administration and the follow-up TAI administration. The TAI is comprised of two sub-scales, the TAI-W and the TAI-E. In general the participant’s TAI-W and TAI-E scores improved with each administration, and they showed very similar patterns and percentiles to one another (see figures 4.4, 4.5, and 4.6).

It is important to note that most of the participants began treatment in the fourth week of the semester, at which time the first TAI was administered. Each client was at the mid-term point of the semester when the second TAI was administered, and the third TAI was administered when the clients came in for their last treatment session. The follow-up administration was given six months following the last treatment session, which generally coincided with the end of the following semester.
First TAI and STAI administrations were during the initial meeting, second administrations were mid-term time frame, third administration were final treatment session, and the fourth administrations were at the follow-up session.

Figure 4.1
Average of all Participants TAI Percentile scores over the course of treatment
Figure 4.2
TAI Percentile Scores all Participants
First TAI and STAI administrations were during the initial meeting, second administrations were mid-term time frame, third administrations were final treatment session, and the fourth administrations were at the follow-up session.

Figure 4.3
Average of all Participants TAI-W and TAI-E Percentile scores over the course of treatment
First TAI and STAI administrations were during the initial meeting, second administrations were mid-term time frame, third administration were final treatment session, and the fourth administrations were at the follow-up session

Figure 4.4
TAI-W scores for all Participants
First TAI and STAI administrations were during the initial meeting, second administrations were mid-term time frame, third administration were final treatment session, and the fourth administrations were at the follow-up session.

Figure 4.5
TAI-E scores for all Participants

**STAI**

The State Trait Anxiety Inventory (STAI; Spielberger, Gorsch, & Lushene, 1970) measures state and trait anxiety. Participants are asked to report how they feel at that very moment (measuring state anxiety) and how they typically feel (measuring trait anxiety). The STAI yields both a trait anxiety score and a state anxiety score. In general, trait anxiety scores improved (e.g., decreased) over the course of treatment (see figures 4.7, 4.8, and 4.9), which is interesting as they are generally considered stable (Spielberger, 1983). After the mid-treatment administration in session number five, or data week four, there was a continual dropping of scores, thus showing lower levels of trait anxiety with each administration of the STAI measure. Four of the clients’ trait anxiety scores showed improvement with each administration, while three of the participants (David, Abby, and Natalie) showed an increase in trait anxiety from the initial measurement to the mid-point measurement. Two of these clients also displayed more generalized anxiety symptoms and the third had STAI scores that were well below...
average, which means that even a slight variation in his answers would show an increase. However, each of these three participants showed an overall improvement in scores after the mid-treatment administration. This mid-treatment administration is also when SD was introduced. Further, each participant’s follow-up trait anxiety scores were lower than the initial and mid-point scores. Follow-up scores suggest durability as they were all equal to or lower than the end-point Trait anxiety scores. This pattern is quite different from the state anxiety scores, which varied widely and showed no discernable pattern. This measure appears to show an idiosyncratic fluctuation, and this author was unable to determine a relationship between state anxiety and the TA treatment program.

![Graph showing average STAI for all participants over the course of treatment](image)

First TAI and STAI administrations were during the initial meeting, second administrations were mid-term time frame, third administrations were final treatment session, and the fourth administrations were at the follow-up session.

Figure 4.6
Average of all Participants’ STAI- Trait and State scores over the course of treatment
Figure 4.7
Trait Anxiety Percentile Scores all Participants
Figure 4.8
State Anxiety Percentile Scores all Participants

*The Anxiety Highs and Lows*

Examining which participants scored highest and lowest on the process measures helps illuminate the process of change, in test anxiety, on an individual level. It allows us to see how different students with varying levels of learning difficulties began the treatment program and how they responded to the treatment program.

*Anxiety Scores:* The two participants in this study with a diagnosed learning difficulty, who completed the study, had the highest reported Initial TAI scores. Besides sharing the highest TAI scores and learning difficulty status, David (100th percentile) and Matt (99th percentile) also shared gender, race, traditional student status, and both reported that test anxiety had been a life-long problem for them. These findings are interesting as the research clearly indicates that students with a learning difficulty are prone to higher levels of test anxiety (Brinkerhoff, Shaw, & McGuire, 1993; Hill, 1996; Stolowitz, 1995), and Swanson and Howell (1996) found that for test anxious students with a learning difficulty, the highest correlation was between test anxiety and task irrelevant thoughts; David and Matt had two of the highest TAI-W scores (100th and 98th...
percentiles respectively). It is important to note that at the follow-up session both David and Matt had lowered levels of perceived test anxiety, state anxiety, and trait anxiety, which suggests that this treatment program also works for individuals with a diagnosed learning difficulty. One difference is that David seemed to take longer to respond to the treatment, as he routinely had the highest reported TAI scores throughout the treatment program, except for the follow-up.

James had the highest reported anxiety score on four out of the five anxiety measures at the follow-up session. His TAI score was at the 83rd percentile, his TAI-E score was at the 93rd percentile, his TAI-W score was at the 88th percentile, and his STAI-S was at the 58th percentile. It has been previously discussed that he did not continue self-practice of PMR.

The two Participant who reported the lowest initial test anxiety scores were Natalie (40th percentile) and Shauna (54th percentile). These two also shared gender, non-learning difficulty status, race, traditional student status, and experiencing test anxiety for one year or less. Natalie and Shauna both also reported low emotionality (50th and 61st percentiles respectively), or physical symptoms, which may support the research that suggests that the cognitive manifestations, (which are believed to disrupt test taking by increasing test anxiety, and decreasing academic performance) is experienced only after noticing heightened levels of physical symptoms (Hembree, 1988, Morris, Davis, & Hutchings, 1981; Schwarzer, 1984; Spielberger & Vagg, 1995).

The follow-up scores showed Natalie and Abby (16th percentile for both) with the lowest TAI-W scores, which is interesting as they seem to be among the top academic achievers in this small group. Natalie was a junior Psychology major with a 3.83 GPA who desired to attend graduate school, and Abby was a law student. The two individuals who spent a great deal of time cogitating were able to reduce their troubling cognitions, which may have helped lower their other anxiety scores. Shauna and Tamika reported the lowest follow-up TAI-E scores (16th percentile for both), which is interesting given that both of these Participant had significant personal distress during the semester of treatment, and both reported an increase in physical symptoms when describing the stress that these personal issues caused. Shauna’s boyfriend was deployed to the war in Iraq, and Tamika’s mother had been diagnosed with a serious illness. Both reported early TAI-E scores above the 60th percentile, and at program completion they were reporting scores at the 16th percentile. The treatment program may have helped them lower the physical symptoms of the anxiety they were experiencing due to these personal situations as well.

David consistently reported the lowest levels of state and trait anxiety from the initial administration through the follow-up session, though Shauna and James also reported rather low trait anxiety scores throughout.
Table 4.1
Anxiety High and Low Scores

<table>
<thead>
<tr>
<th>Measure (Initial)</th>
<th>Individual with the highest score</th>
<th>Percentile</th>
<th>Individual with the lowest score</th>
<th>Percentile</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAI</td>
<td>David</td>
<td>100</td>
<td>Natalie</td>
<td>40</td>
<td>80.78</td>
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<tr>
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<td>David</td>
<td>100</td>
<td>Natalie</td>
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<td>84.33</td>
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<td>Natalie</td>
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<td>86.56</td>
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<td>David</td>
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<td>David</td>
<td>2</td>
<td>38.11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measure (Mid-point)</th>
<th>Individual with the highest score</th>
<th>Percentile</th>
<th>Individual with the lowest score</th>
<th>Percentile</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAI</td>
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<td>Shauna</td>
<td>27</td>
<td>68.57</td>
</tr>
<tr>
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<td>David</td>
<td>99</td>
<td>Shauna</td>
<td>33</td>
<td>71.86</td>
</tr>
<tr>
<td>TAI-W</td>
<td>David</td>
<td>100</td>
<td>Natalie &amp; Abby</td>
<td>50</td>
<td>71.29</td>
</tr>
<tr>
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<td>Natalie</td>
<td>91</td>
<td>Shauna</td>
<td>2</td>
<td>50.86</td>
</tr>
<tr>
<td>STAI-S</td>
<td>Matt</td>
<td>78</td>
<td>David</td>
<td>2</td>
<td>34.71</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measure (End-point)</th>
<th>Individual with the highest score</th>
<th>Percentile</th>
<th>Individual with the lowest score</th>
<th>Percentile</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAI</td>
<td>David</td>
<td>95</td>
<td>Shauna</td>
<td>9</td>
<td>43</td>
</tr>
<tr>
<td>TAI-E</td>
<td>David</td>
<td>97</td>
<td>Natalie &amp; Shauna</td>
<td>24</td>
<td>51.71</td>
</tr>
<tr>
<td>TAI-W</td>
<td>David</td>
<td>93</td>
<td>Natalie &amp; Abby</td>
<td>24</td>
<td>47.86</td>
</tr>
<tr>
<td>STAI-T</td>
<td>Abby</td>
<td>42</td>
<td>Shauna &amp; James</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td>STAI-S</td>
<td>Shauna</td>
<td>45</td>
<td>David &amp; James</td>
<td>2</td>
<td>27.86</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measure (Follow-up)</th>
<th>Individual with the highest score</th>
<th>Percentile</th>
<th>Individual with the lowest score</th>
<th>Percentile</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAI</td>
<td>James</td>
<td>83</td>
<td>Tamika &amp; Natalie</td>
<td>6</td>
<td>28.43</td>
</tr>
<tr>
<td>TAI-E</td>
<td>James</td>
<td>93</td>
<td>Shauna &amp; Tamika</td>
<td>16</td>
<td>33.86</td>
</tr>
<tr>
<td>TAI-W</td>
<td>James</td>
<td>88</td>
<td>Natalie &amp; Abby</td>
<td>16</td>
<td>32.43</td>
</tr>
<tr>
<td>STAI-T</td>
<td>Abby</td>
<td>36</td>
<td>David, Shauna &amp; Tamika</td>
<td>0</td>
<td>10.43</td>
</tr>
<tr>
<td>STAI-S</td>
<td>James</td>
<td>58</td>
<td>David</td>
<td>2</td>
<td>22.86</td>
</tr>
</tbody>
</table>
In general, GPA showed an improvement during the semester of treatment or the semester after treatment. There were distinct individual differences in GPA, and it should be noted that many of the clients reported seeking treatment only after struggling academically or after signing up for a challenging semester. It should also be noted that there were considerable limitations in the collection of the GPA data. Three measurements of GPA were to be collected from each participant. The three GPA measures were as follows: semester before treatment GPA, semester of treatment GPA, and semester after treatment GPA. Only five of the nine participants had all three GPA measures, and two of the participants did not have any of the measures available. One participant failed to finish the semester prior to treatment and the semester of treatment and then decided to withdraw from school the semester after treatment. Another participant failed to provide his GPA during the only session that he attended; and, as he was not attending the university, this author had no access to his records.

Of the complete GPA data that does exist, it can be determined that four of five participants had their highest GPA either the semester of treatment or the semester after treatment. Only one participant had their highest GPA semester the semester prior to treatment. It is believed that this participant’s GPA began to slip once she got into her major area of study. This particular participant sought TA treatment the semester after she began her junior year, and had then begun course work in her major area of study. It was during this more difficult course work and increased test anxiety that she began to see her GPA slip further. However, she was able to bring her grades up during the semester after treatment; this may be due to the fact that she had learned how to keep her test anxiety under control.
The subjective units of distress (SUD; Kennedy & Doepke, 1999) measures how distressed the subject felt, on a daily basis, in each of the classes he or she was taking. In general, there was an overall pattern of decline in SUD scores over the course of treatment that became most noticeable during the second four week period of the treatment program, which was also after SD was introduced into the treatment program. This decline in SUD appears to diminish as the treatment sessions come to an end and the end of the semester approached. There was no single week identified that was either most distressing for all of the participants or least distressing for all of the participants. This is an area where individual variation was present and there were idiosyncratic fluctuations.
Data week 1 aligns with session 2, data week 2 (session 3) is when PMR was introduced, and data week 4 (session 5) is when SD is introduced with the PMR.

Figure 4.10
Average SUD scores of all Participants for the First Four Data Weeks of the Treatment Program
The subjective units of efficiency (SUE) questionnaire was developed by this examiner, and was based on the SUD scale, to measure how efficient the subject felt, on a daily basis, in each of the classes he or she was studying. In general, there was an overall increase in SUE scores over the course of treatment, which was most noticeable during the second four week period of the treatment program, which was also after SD was introduced into the treatment program. Six of the six participants that reported SUE data for the fifth week, reported their highest SUE ratings for that week, which was after SD was introduced into the treatment sessions. Again, the fifth session (data week four) was when the SD was added to the treatment program, which may have helped them feel even more relaxed, and subsequently efficient while studying. This suggests that after beginning SD and working on their anxiety hierarchies the participants, in general, felt more efficient in their studying, which may explain why there was not a universal...
increase in hours studied at that time. In general, this increased perception of efficiency persisted throughout the remainder of the treatment program.

![Average SUE First Four Data Weeks](chart)

Data week 1 aligns with session 2, data week 2 (session 3) is when PMR was introduced, and data week 4 (session 5) is when SD is introduced with the PMR.

Figure 4.12
Average SUE scores of all Participants for the First Four Data Weeks of the Treatment Program
Figure 4.13
Average SUE scores of all Participants over the Course of the Treatment Program

DOC

The Degree of Competency (DOC) questionnaire was developed by this examiner, and was based on the SUD, to measure how competent the subject felt, on a weekly basis, in each of the classes he or she was taking. In general, DOC increased over the course of treatment, becoming most noticeable during the second four weeks of the program, which is also when SD is added to the treatment regime. Six of seven participants experienced consistently higher feelings of competence than their original DOC scores, beginning with the week after their fifth session when SD was introduced. The trend appears to be an increase after the introduction of SD that continues throughout the remainder of the treatment program. Also, each of the participants reported a higher level of reported competence at the last session than they reported at the first session.
Data week 1 aligns with session 2, data week 2 (session 3) is when PMR was introduced, and data week 4 (session 5) is when SD is introduced with the PMR.

**Figure 4.14**
Average DOC scores of all Participants for the First Four Data Weeks of the Treatment Program
Data week 1 aligns with session 2, data week 2 (session 3) is when PMR was introduced, data week 4 (session 5) is when SD is introduced with the PMR, and data week 8 (session 9) is the last session.

Figure 4.15
Average DOC Scores of all Participants over the Course of the Treatment Program

*Hours studied*

The hours studied captured the amount of time (reported in hours) that the student spent studying, with each subject being reported separately, on a daily basis. There were considerable variations in the number of hours studied. Three of the clients (Matt, Shauna, and Tammy) increased the hours they actively studied over the course of the semester, one participant (Tamika) decreased the number of hours she devoted to schoolwork, and the other four (David, James, Abby, and Natalie) were rather consistent with the number of hours they spent studying over the course of the semester. Interestingly, David’s, Natalie’s, and Tammy’s highest hours studied correlated with their lowest DOC ratings, which were all between data collection weeks three and five. However, there was no one week that yielded the highest number of hours studied for all of the participants; instead, there was instead idiosyncratic fluctuation. However, one consistency reported was that the act of recording the hours they spent studying brought their studying, or lack thereof, to their attention. Each of the participants commented on
the volume of time they spent studying and reported never having thought about it much prior to this program. Two of the participants actually increased the time they spent studying because they believed that the amount of time they recorded would be evaluated. Once that issue was resolved, their hours studied returned to more typical levels. One of the participants was shocked to find how little she studied; however, she reported that in law school they only have final exams, which made it difficult for her to be motivated to study during the course of the semester.

![Average Hours Studied First Four Data Weeks](image)

Data week 1 aligns with session 2, data week 2 (session 3) is when PMR was introduced, and data week 4 (session 5) is when SD is introduced with the PMR.

**Figure 4.16**
Average Hours Studied of all Participants for the first four data weeks of the treatment program
Data week 1 aligns with session 2, data week 2 (session 3) is when PMR was introduced, data week 4 (session 5) is when SD is introduced with the PMR, and data week 8 (session 9) is the last session.

Figure 4.17
Average Hours Studied of all Participants over the Course of the Treatment Program

**GPA, SUD, SUE, DOC, and Hours Studied**

Natalie consistently had the highest GPA; she also reported the third highest SUE (6.73) and the second highest DOC (7.19) and the fourth highest hours studied (17.69), though she had the third highest SUD (4.31). Her GPA may be the result of her efficiency while studying and her perceived competence in her courses, or the competence may well be a result of her achievement. It could be argued that her level of distress keeps her studying, though she consistently had one of the lowest test anxiety scores. This lowered test anxiety may have allowed her to achieve at a higher level than the participants who had higher, more debilitative levels of test anxiety.

No one subject had the lowest GPA for each measure. The lowest GPA reported for the semester before treatment was from Shauna, who reported that she had struggled with the upper-division Arabic classes before seeking test anxiety treatment. Abby had the lowest reported GPA for the semester of treatment. She also had the lowest hours
studied and some difficulty with distress and efficiency when she did study; this could very well be related to the lowered GPA. James had the lowest reported GPA for the semester after treatment. Though there could be many explanations for this, from increased difficulty of his classes, larger workload of the upper-division classes, or extracurricular activities, it is interesting to note that not only did his GPA decrease at the follow-up but his anxiety levels increased and he reported that he had not continued practicing the PMR.

Tammy reported the highest level of distress (6.12), the lowest levels of efficiency while studying (5.04), and the lowest levels of competence with her courses (4.75); this may have contributed to her ultimate failure in the treatment program. It is also known that students who have a history of academic failure or difficulties are likely to have lower academic confidence than their peers. (Brinkerhoff, Shaw, & McGuire, 1993).

Conversely, David, who routinely reported the highest levels of test anxiety, reported the lowest levels of distress (3.12). However, he also reported the second highest average weekly hours studied (19.31), and the second highest level of efficiency while studying (6.86). These additional factors may have contributed to his lowered SUD, as he reported that he always felt prepared and ready for the exam until the moment he began taking the exam.

Shauna reported the highest SUE scores (7.38). Her lower distress score (3.62) may have contributed to her efficiency while studying and may explain her lower hours studied (12.31), as she would not waste time while studying so she could do more studying in less time. Shauna had the third lowest SUD score and the third lowest average weekly hours studied; however, she reported one of the lowest competence scores (5.06). This DOC score does not necessarily support these other findings, unless the lowered study hours contributed to her lowered feelings of competence.

James reported both the highest DOC (7.42) and the most hours typically studied in a week (22.25). These two findings may go hand in hand, namely, that as he studied more, he gained a greater sense of competence. However, he had the third highest SUD score (4.20) and the third lowest SUE score (6.10). James’ SUD scores and SUE scores may have contributed to his increasing anxiety scores at the follow-up administration and may be related to his lack of self-practice of the PMR.

Abby had the lowest hours studied at 9.45 hours in a typical week. Abby also had the second highest SUD score (4.76), the second lowest SUE score (5.98), and the fourth lowest DOC score (5.41). Abby’s decreased study hours may have contributed to her distress and lowered efficiency when she did study. She reported being overwhelmed when she would attempt to study and would then begin a process of avoidance, which negatively reinforced her behavior.
Table 4.2
GPA, SUD, SUE, DOC, and Hours Studied High and Low Scores:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Individual with the highest score</th>
<th>Percentile</th>
<th>Individual with the lowest score</th>
<th>Percentile</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPA during tx</td>
<td>Natalie</td>
<td>3.83</td>
<td>Abby</td>
<td>1.41</td>
<td>2.42</td>
</tr>
<tr>
<td>GPA before tx</td>
<td>Natalie</td>
<td>3.62</td>
<td>Shauna</td>
<td>2.0</td>
<td>2.60</td>
</tr>
<tr>
<td>GPA after tx</td>
<td>Natalie</td>
<td>3.9</td>
<td>James</td>
<td>2.18</td>
<td>2.72</td>
</tr>
<tr>
<td>SUD *</td>
<td>Tammy</td>
<td>6.12</td>
<td>David</td>
<td>3.12</td>
<td>4.13</td>
</tr>
<tr>
<td>SUE</td>
<td>Shauna</td>
<td>7.38</td>
<td>Tammy</td>
<td>5.04</td>
<td>6.43</td>
</tr>
<tr>
<td>DOC</td>
<td>James</td>
<td>7.42</td>
<td>Tammy</td>
<td>4.75</td>
<td>6.05</td>
</tr>
<tr>
<td>Hours Studied</td>
<td>James</td>
<td>22.25</td>
<td>Abby</td>
<td>9.45</td>
<td>15.02</td>
</tr>
</tbody>
</table>

* This item should be reversed for interpretation, i.e., highest score is most detrimental for this item

Figure 4.18
Average SUD per Participant

Average SUD per Participant
Figure 4.19
Average SUE per Participant
Figure 4.20
Average DOC per Participant
What about the participants who did not complete the study?

Two of the nine participants did not complete the treatment program; one terminated after the initial session and another terminated after her fourth session, just before SD was to be introduced into the program. It would be important to determine the factors that might contribute to premature termination. One difference in the two premature terminations was age. Tammy was the oldest subject at 40, and Alfred was the youngest subject at 17. The other participants were all traditional college students. Another way that Alfred differed from the rest is that his parents, not he himself, wanted the test anxiety treatment; this may be a product of his age as well. Additionally, both Tammy (17th percentile) and Alfred (19th percentile) reported among the lowest levels of trait anxiety; only David had a lower trait score. Tammy had the second highest state anxiety score (68th percentile), with Matt’s state anxiety score being the highest (99th percentile).

In many ways, however, Alfred and Tammy were like the other participants. Both had only recently begun experiencing test anxiety, both within the last two years. Tammy also experienced a more generalized anxiety, which was common among this group of participants, with all of the women reporting personal anxiety as well as
academic anxiety. Tammy and Alfred reported TAI, TAI-W, and TAI-E scores near the median. Tammy’s state score was high (99th percentile), but Alfred’s score was again near the median for this group (90th percentile). Additionally, neither gender, nor learning difficulty status seemed to play a role in their pre-mature termination: Tammy was a female and Alfred was a male; Tammy had no diagnosed learning difficulty and Alfred did have a diagnosed learning difficulty. Additional study in this area could benefit from including an evaluation of motivation for treatment.

**Potential Use of Test Anxiety Treatment as a Preventive Measure**

Additional study may also show the efficacy of test anxiety treatment as a preventive measure. This study showed positive results for the use of PMR. Each of the participants who continued practicing the PMR after the treatment sessions ended continued to decrease their anxiety scores. The PMR seems to have facilitated continued improvement in test anxiety, trait anxiety, and state anxiety. Of the seven Participants who completed the test anxiety treatment program, five continued practicing PMR on their own. Only Matt and James did not continue the PMR. Matt’s scores were unaffected by his discontinuance of the PMR; however, Matt had left school for the semester so it is entirely possible that his anxiety was lower due to that fact alone. Matt was no longer studying or taking tests, so his test anxiety was obviously lower and his state anxiety would likely be lower. James, however, remained in school, did not practice the PMR, and his anxiety scores increased.

Those participants who practiced PMR continued to decrease their anxiety, despite finals, a new semester, and other personal challenges. It may be speculated that the test anxiety treatment program could be used as a preventive measure for academic anxiety and perhaps other more generalized anxieties. It should be stated that none of the Participants were treated in a preventive manner; each of the participants was experiencing tremendous personal distress when they began the treatment program. Future study would be required to determine if this treatment regime would be effective at preventing test anxiety.

**Individual Case Studies**

*Case number one - David:*

David was a 20-year old Caucasian male who was diagnosed with a learning disorder approximately six months before seeking treatment for test anxiety. He was a junior Business major at Florida State University.

David was contacted and asked if he would like to receive treatment for his test anxiety as part of a research study. He agreed immediately, stating “I am willing to try anything!” He felt as though he had tried everything he knew to do and was quite eager to solve this problem.

David reported that he had experienced test anxiety for as long as he could remember, essentially his “whole life.” He reported that when he would receive the test he would immediately start worrying about doing poorly and he often had an overwhelming desire to leave the classroom. He would also start worrying about forgetting everything he had
learned, which led to his experiencing thought blocking, an inability to retrieve the information that he had studied. Physically, he reported stomachaches, headaches, increased heart rate, and sweating. David reported that these physical symptoms would begin the night before tests.

David reported that after taking the test he would feel better and would even begin to believe that he had done well, as he began focusing on how long he had studied and prepared for the exam and how much information he could recount after the exam. He would often feel as though he knew things “forward and backward.” However, David further reported that he was often disappointed when he got the test back; “I amaze myself with how little I get right.”

David’s test anxiety treatment sessions followed the treatment manual, and he began collecting data after the first session (data week zero) and continued collecting data through the ninth session (data week eight). In the second session, David worked on constructing a test anxiety hierarchy and assigned a SUD to each step (Table 4.3). The PMR was taught beginning the third session (data week two) and SD was begun in the fifth session (data week four), which fell at mid-term time. David did not experience any difficulty engaging in the PMR or the SD. However, when David got to the higher levels on the hierarchy, those with an SUD rating greater than six, he often had to retreat from the visualization of that particular scenario, return to his relaxed state, and then attempt it again before he could successfully get through the visualization and remain relaxed. David was always very receptive, hard working, and open minded.

David’s progress, as viewed through the lens of the dependent variables, is as follows: David’s semester GPA increased somewhat during the semester that he was seeking test anxiety treatment and then declined the next semester. It should be noted that he had delayed taking some of the more challenging courses until the end of his academic career. This may explain the decline in GPA he experienced the semester following treatment. David reported that he “missed” coming to the test anxiety treatment sessions and he believed that not having the weekly sessions hurt his grades, though his test anxiety, state and trait anxiety continued to consistently decrease. This may suggest that the effect of being in treatment helped to improve his academic performance as measured by his grades.

David’s anxiety scores showed general improvement. His overall test anxiety scores decreased throughout treatment and continued to decrease in the six months after treatment ended. David’s TAI-E and his TAI-W scores followed the same general pattern and also decreased during treatment and continued to decrease in the six months after treatment ended. It should be noted that David continued to practice PMR on a weekly basis even after the treatment sessions ended. David’s state anxiety scores stayed consistent throughout the course of treatment. His trait anxiety scores actually increased during treatment and then showed a decrease at his six month follow-up, which is interesting as he did not report any other anxiety symptoms. However, it should be noted that David’s state and trait anxiety scores were all below average. For example, his trait anxiety scores fluctuated from the first percentile in the first STAI administration, up to the third percentile in the second and third STAI administrations, and then decreased in the six months following the end of treatment to zero. His lower anxiety scores may explain the increase seen, as even subtle answer changes would cause his trait anxiety scores to appear to increase.
David’s subjectively reported data showed idiosyncratic fluctuation. His mean SUD scores varied over the course of treatment. His scores fell immediately, which may be due to relief he reported experiencing from seeking help. His scores then began a pattern of incline around data weeks four and five, which was mid-term time frame. His SUD scores then plummeted following mid-terms and then peaked in week seven as the end of the semester approached. David’s mean SUE also oscillated over the course of treatment. His scores began a pattern of incline immediately, which may also be attributed to an increased sense of efficiency due to seeking treatment; but then they began a pattern of descent around data week five after mid-terms. His SUE scores increased at week seven staying consistent as the end of the semester approached. David’s mean DOC scores also varied over the course of treatment. His scores fell in the early treatment weeks, but eventually rose to the pre-treatment levels present at the beginning of the semester. David’s hours studied varied throughout the semester and they predictably rose at data weeks four and five for mid-terms and then dropped at the completion of midterms at data week six. His hours studied then showed an increase as the end of the semester approached at data week eight.

In summary, David’s overall anxiety decreased and there was a general increase in his DOC and SUE over the course of treatment; additionally, his grades were highest the semester of treatment. Once treatment was begun, David reported feeling symptom relief almost immediately. After session three when the PMR was introduced, David reported feeling even more relaxed and more at ease in both testing and study sessions. Additionally, David was given a script and was instructed to practice PMR at home, which he did regularly and continued to do even after the sessions ended, which may help to explain the continued decrease in his anxiety scores.

Table 4.3
David’s Test Anxiety Hierarchy

<table>
<thead>
<tr>
<th>Item</th>
<th>SUD rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Signing up for a class</td>
<td>0</td>
</tr>
<tr>
<td>2. Receiving Syllabus</td>
<td>0</td>
</tr>
<tr>
<td>3. Seeking help from the teacher</td>
<td>1</td>
</tr>
<tr>
<td>4. One week before the test</td>
<td>2</td>
</tr>
<tr>
<td>5. Increased studying for the approaching test</td>
<td>2</td>
</tr>
<tr>
<td>6. Test review in class</td>
<td>4</td>
</tr>
<tr>
<td>7. Looking over test material the day of the test</td>
<td>5</td>
</tr>
<tr>
<td>8. Studying the night before the test</td>
<td>6</td>
</tr>
<tr>
<td>9. Leaving for school the day of the test</td>
<td>6</td>
</tr>
<tr>
<td>10. Walking into the classroom the day of the test</td>
<td>7</td>
</tr>
<tr>
<td>11. Filling out the Scantron sheet</td>
<td>9</td>
</tr>
<tr>
<td>12. Waiting for the teacher to pass out the test</td>
<td>9.5</td>
</tr>
<tr>
<td>13. Getting the test and starting</td>
<td>10</td>
</tr>
<tr>
<td>14. Getting to a question and not knowing the answer</td>
<td>10</td>
</tr>
</tbody>
</table>
Figure 4.22
David’s GPA
First TAI and STAI administrations were during the initial meeting, second administrations were mid-term time frame, third administrations were final treatment session, and the fourth administrations were at the follow-up session.

Figure 4.23
David’s TAI Scores
Figure 4.24
David’s TAI-W and TAI-E Scores
Figure 4.25
David’s STAI Scores
Data Week one was for the week after the initial session, Data Week five was for the week after midterms and after SD had been introduced, and Data Week eight was for the week prior to the last session.

Figure 4.26
David’s SUD Scores
Figure 4.27
David’s SUE Scores
Figure 4.28
David’s DOC Scores
Case number two - James:

James was a 21-year old African-American male. He was a junior Business major at Florida State University. James had never been diagnosed with a learning disorder and reported that his only problem academically was test anxiety.

James contacted the ALEC after hearing about the test anxiety treatment program being offered. He agreed to be a part of the research program and stated that he had “heard great things about the program” and he was eager to “get better.”

James reported that he had been experiencing test anxiety for a little less than one year. It should be noted that he did not declare a major until his junior year; and, as a result, the classes he was taking at the time of the onset of his anxiety symptoms and subsequent treatment were all in his major and were considerably more challenging for him. He reported that he often thought “about failing” when taking a test, and “even when I think I have studied enough for a test, I get very nervous about it and start thinking about my grades.” He also reported several physical symptoms. James reported shaking, increased heart rate, and more rapid breathing while he would take a test. James further reported that these symptoms generally did not present until the day of the exam, and he would typically notice these symptoms manifesting as soon as he was driving to
school to take the test. He also reported that these symptoms generally did not subside until he left the exam; however, his physically-distressing symptoms also tended to re-emerge when he knew that he would be getting the test back or when he thought about the exam.

James’ test anxiety treatment sessions followed the treatment manual, and he began collecting data after the first session (data week zero) and he continued collecting data through the ninth session (data week eight). In the second session, James worked on constructing a test anxiety hierarchy and assigning a SUD to each step (Table 4.4). The PMR was taught beginning the third session and SD was begun in the fifth session, which fell at mid-term time. James did not experience any difficulty engaging in the PMR or the SD. James was largely able to proceed through the hierarchy without retreating though, in an attempt to ensure success, this author would often retreat from the visualization and present it a second time when the higher levels on the hierarchy were reached. Higher items were considered to be items with an SUD rating greater than six. James was always very receptive, hard working, and open minded.

Compared to the semester prior to treatment, James’ semester GPA increased somewhat during the semester that he was seeking test anxiety treatment and then declined the next semester. It should be noted that he had delayed taking some of the more challenging courses until the end of his academic career. This may help to explain the decline in GPA he experienced the semester following treatment. James reported that he believed that not having the weekly test anxiety treatment sessions hurt his grades and his state anxiety, though his test anxiety and trait anxiety stayed below his pre-treatment levels. This may suggest that the effect of being in treatment helped to improve his academic performance as measured by his grades.

James’ anxiety scores, as measured by the TAI and STAI, showed general improvement. James’ overall TAI levels decreased over the course of treatment. His lowest level was at the third administration, during the last treatment session. He showed an increase in test anxiety level from his end-of-treatment administration and his follow-up session six months later; however, his test anxiety did not reach pre-treatment levels. The same pattern was observed for his TAI-W and TAI-E scores. James’ state anxiety scores fluctuated over the course of treatment and were highest at his post-treatment follow-up six months later; this may be due to the cessation of treatment for six months. His lowest state anxiety score was obtained at the third administration during the last treatment session, session number nine. James’ trait anxiety scores showed a consistent decline and remained low at his six-month follow-up.

James’ subjectively reported data showed idiosyncratic fluctuation. His SUD scores varied over the course of treatment. His early scores showed a decline, but at data week six after mid-terms were over, there was a steady increase in his scores; however, they were never again as high as his initial scores. James’ SUE scores also varied over the course of treatment. The most prominent increase occurred from the fourth to fifth session, which are data weeks three and four; and his highest reported SUE is at data week five, which is after mid-terms and after SD has been introduced into the treatment regime. James’ DOC scores showed a steady increase, peaking during the fifth and sixth data weeks, after mid-terms and the introduction of SD. James’ hours studied also oscillated, peaking during the fourth data week, which was right before mid-terms, and
then falling the following week. His hours studied increased again, but never reached mid-term level again.

In summary, James’ overall anxiety decreased and there was an overall increase in his DOC and a decrease in his SUD over the course of treatment; additionally, his grades were higher the semester of treatment. Once the treatment sessions began, he reported feeling symptom relief almost immediately. After session three when the PMR was introduced, James reported feeling even more relaxed and more at ease in both testing and study sessions. Additionally, James was given a script and was instructed to practice PMR at home, which he did regularly, though he admitted that he stopped practicing the PMR after the treatment sessions ended, which may help explain the increases in anxiety that he did experience between the last treatment session and the follow-up session six months later.

Table 4.4
James’ Test Anxiety Hierarchy

<table>
<thead>
<tr>
<th>Item</th>
<th>SUD rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Registering for a low stress class (Weightlifting)</td>
<td>0</td>
</tr>
<tr>
<td>2. Registering for a moderately stressful class (e.g., College Algebra)</td>
<td>3</td>
</tr>
<tr>
<td>3. Going to class (day in and day out pressure to attend)</td>
<td>4</td>
</tr>
<tr>
<td>4. Looking at the homework for that day/week</td>
<td>4</td>
</tr>
<tr>
<td>5. Registering for a very stressful class (Marketing)</td>
<td>5</td>
</tr>
<tr>
<td>6. Getting the syllabus on the first day and seeing the tests/workload</td>
<td>6</td>
</tr>
<tr>
<td>7. One week before the exam</td>
<td>6</td>
</tr>
<tr>
<td>8. Studying for the exam (1 week away)</td>
<td>7.5</td>
</tr>
<tr>
<td>9. Studying for the exam (3 and fewer days away)</td>
<td>8.0</td>
</tr>
<tr>
<td>10. Class review (one day before the exam</td>
<td>8.5</td>
</tr>
<tr>
<td>11. Studying the night before the exam</td>
<td>8.5</td>
</tr>
<tr>
<td>12. Morning of the exam</td>
<td>8.5</td>
</tr>
<tr>
<td>13. Walking into the class on the day of the exam</td>
<td>8.5</td>
</tr>
<tr>
<td>14. In class waiting for the test to be handed out</td>
<td>9.5</td>
</tr>
<tr>
<td>15. Getting the test</td>
<td>9.8</td>
</tr>
<tr>
<td>16. Taking the test</td>
<td>10.0</td>
</tr>
<tr>
<td>17. Thinking about how I did on the test after turning it in</td>
<td>9.0</td>
</tr>
<tr>
<td>18. Checking the test grade on the Internet</td>
<td>10.0</td>
</tr>
</tbody>
</table>
Figure 4.30
James’ GPA
First TAI and STAI administrations were during the initial meeting, second administrations were mid-term time frame, third administrations were final treatment session, and the fourth administrations were at the follow-up session.

Figure 4.31
James’ TAI Scores
Figure 4.32
James’ TAI-W and TAI-E Scores
James’s State Trait Anxiety Percentile Scores

Figure 4.33
James’ STAI Scores
Data Week one was for the week after the initial session, Data Week five was for the week after midterms and after SD had been introduced, and Data Week eight was for the week prior to the last session.

Figure 4.34
James’ SUD Scores
Figure 4.35
James’ SUE Scores
Figure 4.36
James’ DOC Scores
Figure 4.37
James’ Average Hours Studied Scores

Case number three - Abby:

Abby was a 23-year old Caucasian female. She was in her second year of law school at Florida State University. Abby had never been diagnosed with a learning disorder and believed that her academic problems resulted from test anxiety. However, after further inquiry, it was noted that Abby endorsed many symptoms of a more generalized anxiety as well; and she was urged to seek outside counseling for these symptoms.

Abby contacted the ALEC after hearing about the test anxiety treatment program being offered. She agreed to be a part of the research program and scheduled an appointment immediately. She reported being very excited to start the treatment program as she felt as though her life and school were “getting out of control.”

Abby reported that her academic anxiety had only emerged since she began law school. She reportedly had no difficulties with her undergraduate studies and considered herself to be a “good student” during her undergraduate years. Abby was disturbed by the Socratic Method employed in law school and got “very nervous” when attending class as there was always the potential that she would be called on to answer a question or lead a discussion. She reported “freezing up” when she was called on and that she could “never remember the information” the professor was asking about. She reported
feeling “stupid” and “unprepared.” Abby reported a host of physical symptoms, including stomachaches, muscle tension, and sweating. These symptoms occurred daily as she experienced them each time she would attend classes. The anxiety and the physical symptoms of anxiety would re-emerge when she attempted to study at home, which is why she often would simply not study. It should also be reported that Abby subsequently sought treatment with a medical doctor and was diagnosed with Generalized Anxiety Disorder and began taking Paxil during the course of the treatment.

Abby’s test anxiety treatment sessions followed the treatment manual, and she began collecting data after the first session (data week zero) and continued collecting data through the ninth session (data week eight). In the second session, she worked on constructing a test anxiety hierarchy and assigning a SUD to each step (Table 4.5). The PMR was taught beginning the third session and SD was begun in the fifth session. Abby had difficulty relaxing and often times squirmed in her chair and fidgeted throughout the relaxation segments. As the PMR sessions proceeded, she got better at relaxing and eventually drifted off into a sleep-like state; however, when the SD sessions had begun, Abby had some difficulty progressing through the hierarchy. She would often have to attempt the visualizations twice. She would retreat from the visualization of that particular scenario, return to her relaxed state, and then attempt it again before she could successfully get through the visualization and remain relaxed. Despite the slow movement through her hierarchy, Abby remained committed, receptive, hard working, and open minded.

Abby’s semester GPA decreased somewhat during the semester that she was seeking test anxiety treatment, and then was unreported the next semester as Abby took a break from law school. Abby was in her second year of a combined MBA and law school program when she began treatment. She reportedly felt overwhelmed by the pressure of law school and wanted to take at least one semester off and work as an apprentice for a lawyer before continuing. She had begun working for a local attorney that semester and vastly enjoyed it, although she admitted that it often took up the time she would have spent studying. This may help explain the decline in GPA she experienced the semester of treatment. Abby reported that she felt more relaxed when she was undergoing treatment and that she “missed” coming to the test anxiety treatment sessions when they had concluded. When she came back for her follow-up session, she was no longer in classes, which may explain why her anxiety scores all continued to decline after treatment ended. However, she also continued to practice PMR on her own after the treatment sessions ended.

Abby’s anxiety scores all showed continuous improvement. Her TAI scores fell throughout the course of treatment and continued to decrease even after the treatment sessions ended, as indicated by her follow-up session scores (TAI administration number four). Abby’s TAI-W and TAI-E show the same pattern. Abby’s state and trait anxiety scores display a pattern that is nearly identical to each other. Her scores increased from the first administration to the second, which is the mid-term point in the semester. Both Abby’s state and trait anxiety scores then began to decrease as the treatment sessions went on and then continued to fall even after treatment had ended.

Abby’s subjectively reported data showed idiosyncratic fluctuation. Her SUD scores were lowest in the beginning of the treatment sessions. She reported her lowest scores during the second data week. Abby’s scores then peaked at data week three,
which was the fourth session, around the mid-point of the semester. Her scores were never again that high but remained higher than her initial ratings. Abby did not report her SUE ratings for two weeks, sessions five and six, as she reported that she was not studying at all during that time and, therefore, did not feel that she could report on her level of efficiency while studying. The SUE ratings that were provided showed variation, with her lowest rating of efficiency being reported during data week three, which was session four, and her highest level of efficiency being reported for data week one at the very beginning of the semester. It is interesting to note that her lowest efficiency rating preceded two weeks of not studying. It is this author’s belief that Abby essentially gave up studying and trying after a few in-class failures and only started engaging in class after several TA treatment sessions and the introduction of the SD in data week four. Abby’s DOC scores also showed variability. Her highest score was reported during the last data week, and the second highest score was reported the week prior. It is believed that, as she worked through the final items on the anxiety hierarchy, she began to feel more competent and less anxious about school. Abby’s hours studied also fluctuated over the course of treatment, with her highest rating being reported for data week three, or session four, prior to the mid-point in the semester; this also aligns with the lowest SUE rating and her highest SUD rating. Her hours studied then dropped to zero for the next two weeks, then began increasing for the rest of the treatment program, but never again reached the high point reported for data week three.

In summary, Abby’s overall anxiety decreased and there was an overall increase in her DOC. Unpredictably, there was an overall increase in her SUD and overall decrease in her SUE over the course of treatment; additionally, her grades were lower the semester of treatment. It is important to note that Abby was distressed with her academic career and had decided that she would not be attending school the next semester; surely, this could have affected her SUE and her SUD. Additionally, the feeling of giving up may have affected her grades. Even after treatment had begun, Abby did not report symptom relief; it was only after she began the SD that Abby described being able to attend class “without feeling nauseous.” After both SD and PMR had been introduced, she reported being more at ease in classroom situations where she was called upon to answer questions in front of the class. Additionally, Abby was given a script and was instructed to practice PMR at home, which she reported doing regularly. She also reported continuing the PMR practice after the sessions ended.

<table>
<thead>
<tr>
<th>Item</th>
<th>SUD rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attending a function for school</td>
<td>1</td>
</tr>
<tr>
<td>Prepared public speaking for school</td>
<td>2.5</td>
</tr>
<tr>
<td>Registering for classes</td>
<td>3.0</td>
</tr>
<tr>
<td>Right before the semester starts</td>
<td>3.5</td>
</tr>
<tr>
<td>Buying books</td>
<td>4.0</td>
</tr>
</tbody>
</table>
Table 4.5 – Continued

6. Going to first day of classes 5.0
7. Review (for test) in class 5.5
8. Walking into the class the day of test 6.0
9. Taking the test 6.5
10. Studying for the test 7.5
11. Turning the test in (never feel done) 8.0
12. Waiting to get grades back 8.5
13. Being called on in class 9.5
14. Being called on and thinking I do not know the answer 10.0

Figure 4.38
Abby’s GPA
First TAI and STAI administrations were during the initial meeting, second administrations were mid-term time frame, third administrations were final treatment session, and the fourth administrations were at the follow-up session.

Figure 4.39
Abby’s TAI Scores
Figure 4.40
Abby’s TAI-W and TAI-E Scores
Figure 4.41
Abby’s STAI Scores
Data Week one was for the week after the initial session, Data Week five was for the week after midterms and after SD had been introduced, and Data Week eight was for the week prior to the last session.

Figure 4.42
Abby’s SUD Scores
Figure 4.43
Abby’s SUE Scores
Figure 4.44
Abby’s DOC Scores
Case number four - Matt:

Matt was a 19-year old Caucasian male who was diagnosed by this author, through the ALEC, with a learning disorder approximately one month before seeking treatment for test anxiety. He was a sophomore at Florida State University who desired to major in Special Education.

Matt was contacted and asked if he would like to receive treatment for his test anxiety as part of a research study. Matt was relieved to think that his academic problems may have been a result of test anxiety and, as such, treatable.

Matt reported that he had experienced test anxiety for as long as he could remember; “I’ve had it forever.” Matt reported that during tests he would begin worrying about what his parents would think of his grades and whether or not he would “ever make it through school.” During the initial intake session, Matt laid his head down on the desk and began crying while discussing his academic problems. He was very concerned about “making my parents proud of me” and “making them happy.” These thoughts would uncontrollably re-occur throughout testing situations, which prevented Matt from retrieving the relevant information needed to successfully take the test. Physically he reported that his heart raced, and he would become nauseous and jittery. Matt reported
that the all these symptoms would begin the night before an exam and persist until he was able to find out his grade. Additionally, Matt reported many symptoms that seemed to be more social anxiety, such as having to interact with people and “being social.” Matt also reported time-management problems and possible substance-abuse difficulties that complicated the academic anxiety issue for him. Matt was directed to seek outside counseling for these other anxiety symptoms and the substance-abuse issue. It should be noted that another source of stress and subsequent feelings of inadequacy emerged whenever Matt compared himself to his twin brother. Matt’s twin brother reportedly had none of Matt’s academic or social challenges.

Matt’s test anxiety treatment sessions followed the treatment manual, and he began collecting data after the first session (data week zero) and continued collecting data through the ninth session (data week eight). In the second session, Matt worked on constructing a test anxiety hierarchy and also drafted one that dealt more with his social anxiety; he then assigned a SUD to each step (Table 4.6). The PMR was taught beginning the third session and SD was begun in the fifth session, which fell at mid-term time. Matt experienced some difficulty as he proceeded through his test anxiety hierarchy, as he would often squirm with discomfort and at times would begin to cry. He progressed through his hierarchy very slowly, completing no more than three steps in any one session. Despite these difficulties, Matt remained committed and hard working, and in the end he was able to successfully work through the entire hierarchy while staying relaxed; in fact, he fell asleep during the SD in the last session.

There is no available data to show how treatment affected Matt’s GPA as he withdrew from classes the semester of treatment and then withdrew from the University the semester after treatment. Matt reported feeling overwhelmed by the academic pressures of college and had unsuccessfully taken the CLAST exam twice, which students are required to pass before they can be considered a junior and begin taking courses in their major area of study. Additionally, successful completion of this exam is needed before a student can graduate with an education degree, and Special Education was Matt’s desired major. These combined pressures and failures exacerbated the anxiety already present in Matt and made test taking even more difficult for him.

Matt’s anxiety scores all showed continuous improvement. His TAI scores fell throughout the course of treatment and continued to decrease even after the treatment session ended, as indicated by his follow-up session scores, which is TAI administration number four. Matt’s TAI-W and TAI-E show the same pattern. Matt’s state and trait anxiety scores display patterns that are nearly identical to each other. His scores continually decreased, regardless of the time of the semester, and then continued to fall even after treatment had ended. Matt reported feeling more relaxed when he was undergoing treatment. In fact, Matt maintained e-mail contact with the researcher for several months after treatment completion and routinely commented on how much he had enjoyed coming to the test anxiety treatment sessions, and how they made him feel more comfortable in everyday life. When Matt came back for his follow-up session, he was no longer in classes. This may account for some of the decline in his anxiety scores even after treatment ended.

Matt’s subjectively reported data showed idiosyncratic fluctuation. His SUD scores were lowest in the beginning of the treatment sessions, reporting his lowest scores for the week after the first session. His scores immediately increased the during the
second data week and then decreased slightly the following week before beginning a steady increase through data week five, which was mid-terms. At data week five the SD had also begun, which may partially account for the decrease in his reported SUD for data weeks six and seven. Matt’s SUD ratings then increased from data week seven to data week eight. Data week eight is the week prior to the participant’s last session, near the end of the semester, and for Matt, the time when he was deciding whether or not to withdraw for the semester, which may explain his increase in perceived distress. Matt’s SUE ratings showed variation, with his lowest rating of efficiency being reported during data week four, which was mid-terms, and his highest level of efficiency being reported for data weeks one (at the very beginning of the semester) and data week five, after SD had been introduced. It is this author’s belief that Matt felt efficient and hopeful at the beginning of a new semester and at the prospect of receiving help for his test anxiety; however, when he once again began experiencing failure in his classes, his SUE began falling. He only began to regain a feeling of efficiency after the introduction of SD during session five, and after the completion of mid-terms. Matt’s DOC scores also showed some variability. His highest score was reported during the seventh data week and the second highest score was reported for the next week, which also happened to be the last data week. It is believed that, as he worked through the final items on the anxiety hierarchy, he began to feel more competent. He also started thinking about withdrawing from school, and this prospect may have decreased his anxiety and helped him feel more confident in his decision making. Matt’s lowest DOC rating was reported in the second data week. Matt’s hours studied also fluctuated over the course of treatment but show an overall pattern of growth. His highest rating was reported for data week five, session six, which was around the mid-term time frame. This rating aligns with his highest SUD rating and increased ratings of SUE and DOC. His hours studied dropped after the mid-term time frame and began to increase again as the end of the semester approached but never again reached the high point reported for data week five.

In summary, Matt’s overall anxiety decreased and there was an overall increase in his DOC. Unpredictably, there was an overall increase in his SUD and an overall decrease in his SUE over the course of treatment. It may be important to note that Matt was quite frustrated with, and distressed about, his academic achievement and had largely decided that he would not be attending school the next semester. Certainly, these circumstances could have affected his SUE and SUD scores. Once treatment began, Matt reported feeling symptom relief almost immediately. After session three when the PMR was introduced, he reported feeling even more relaxed and more at ease in testing and social sessions, as he would practice the PMR when confronted with a stressful situation. Matt was given a script and was instructed to practice PMR at home, which he did occasionally, though he did not continue this practice after our sessions ended.

Table 4.6
Matt’s Test Anxiety Hierarchy

<table>
<thead>
<tr>
<th>Item</th>
<th>SUD rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Registering for classes</td>
<td>3</td>
</tr>
</tbody>
</table>
Table 4.6 – Continued

2. Going to class the first day and getting the syllabus 4
3. Seeing that there are tests (lots of tests!) 5
4. Worrying about homework assignments 6
5. A week before the test (no time to study) 7
6. Studying and realizing I don’t know the stuff 8.5
7. Day of the test 9
8. Walking into the classroom to take the test 10
9. Taking the test 10
10. Turning in the test 10
11. Worrying about what my parents think 10
12. Making parents proud of me (with school, grades, and everything) 10

Matt’s TAI Percentile Scores

First TAI and STAI administrations were during the initial meeting, second administrations were mid-term time frame, third administration were final treatment session, and the fourth administrations were at the follow-up session.

Figure 4.46
Matt’s TAI Scores
Figure 4.47
Matt’s TAI-W and TAI-E Scores
Figure 4.48
Matt’s STAI Scores
Data Week one was for the week after the after initial session, Data Week five was for the week after midterms and after SD had been introduced, and Data Week eight was week for the week prior to the last session.

Figure 4.49
Matt’s SUD Scores
Figure 4.50
Matt’s SUE Scores
Figure 4.51
Matt’s DOC Scores
Case number five - Shauna:

Shauna was a 20-year old Caucasian female. She was a junior Criminology major at Florida State University. Shauna had never been diagnosed with a learning disorder and reported that her only problem academically was test anxiety.

Shauna was contacted (as a result of her screening at the ALEC) and asked if she would like to receive treatment for her test anxiety as part of a research study. She agreed immediately as she was experiencing “the worst semester ever!” Shauna was considering double majoring in Criminology and Arabic and was, at that time, in an upper-division Arabic class, which took much of her study time and proved to be quite difficult despite her dedication and hard work. Additionally, she lived in her sorority’s house; and it was being renovated so she had to move around from hotel to hotel while the college finished the renovations. This left her with an unsettled feeling.

Shauna reported that she had been experiencing test anxiety for less than one year. Shauna believed that the test anxiety was most pronounced in her Arabic classes and was highest when she had oral exams. Shauna reported that the harder she studied the worse she did; “I start to confuse myself.” She also reported that she would sometimes start thinking about her grades and that caused a panic sensation. Shauna reported more
Shauna’s test anxiety treatment sessions followed the treatment manual, and she began collecting data after the first session (data week zero) and continued collecting data through the ninth session (data week eight). In the second session, Shauna worked on constructing a test anxiety hierarchy and assigning a SUD to each step (Table 4.7); she also constructed a separate personal-anxiety hierarchy as she had many personal issues outlined on her academic hierarchy. Shauna agreed to seek outside help with her more personal anxiety issues. The PMR was taught beginning the third session and SD was begun in the fifth session, which fell at mid-term time. Shauna did not experience any difficulty engaging in the PMR or the SD; however, when she got to the items on her hierarchy dealing with oral exams, she had to attempt them at least twice in order to remain completely relaxed during the visualization process. Shauna’s hierarchy was rather long (27 items) and as such we focused more on the steps with the higher SUD ratings. This made for a slower progression, though this allowed her to cover all of the items that were distinctly troubling. Shauna stayed very flexible, receptive, and hard working.

Shauna’s semester GPA decreased somewhat during the semester that she was seeking test anxiety treatment and then increased the semester after treatment. Shauna had begun taking upper-division Arabic classes and was feeling overwhelmed with the amount of work they required and the amount of anxiety that the oral exams created for her. It is believed that, once Shauna was able to overcome her public speaking and test anxiety, she was able to perform at her actual ability level. This may explain the increase in GPA she experienced the semester after treatment. On a personal level, Shauna was very concerned about the safety of her boyfriend who had been deployed to Iraq the semester before treatment and returned early in the semester after treatment. His safe return may have allowed her to focus more on her academic work.

Four of five of Shauna’s anxiety scores showed continuous improvement. Her TAI scores fell throughout the course of treatment and stayed consistent after the treatment sessions ended, as indicated by her follow-up session scores, which is TAI administration number four. Shauna’s TAI-W score shows the same pattern and her TAI-E score continued to decrease even after the sessions ended. It is believed that as Shauna continued to practice the PMR she became more aware of, and more able to control, her anxiety and, as indicated by her scores, especially her physical symptoms of anxiety. Shauna’s state and trait anxiety scores both showed a decrease from the first administration to the second, but her State scores increased at the end of treatment administration; administration number three is the last day of treatment. It is hypothesized that Shauna was upset about sessions ending and this affected her state anxiety answers. Her trait anxiety scores, on the other hand, showed a continual decrease upon each administration. Shauna continued to engage in the PMR even after treatment ended, which may help to explain the overall decrease in her anxiety scores, even after treatment ended.

Shauna’s subjectively reported data showed idiosyncratic fluctuation. Her SUD scores were erratic. Her highest score occurred in data week two, and her lowest score occurred the next week in data week three. There was an increase in data week four and then a decline again in data week five after SD had been introduced. Beginning in data
week six, Shauna’s SUD scores started increasing as she neared the end of the semester and the end of treatment. Her second-highest score was reported for the last data collection week. Shauna’s SUE ratings also showed variation, with her lowest rating of efficiency being reported during the first data week and her highest rating reported for the fifth data week. Shauna’s efficiency scores increased for the first three weeks and then declined in the fourth week, which was mid-terms. After mid-terms were concluded and SD was introduced, her SUE scores increased (during the fifth data week), reaching her highest score. Her SUE scores then decreased for the next two data weeks and increased as the sessions came to an end. Shauna’s DOC scores also showed variability. Her highest scores were reported during data weeks three and seven; and her lowest score was reported during data week four, which is mid-terms, and aligns with her lowest SUE score. Data week four is session number five and the week that SD was introduced. Engaging in SD and working through the anxiety hierarchy may have facilitated her feeling more competent about school. Shauna’s hours studied also fluctuated over the course of treatment, with her highest rating being reported for data week two, or session three. Shauna had reported that she felt the need to study more as she was keeping a log. This author explained that she was not to judge the time she spent studying, just to record it. After that had been explained to her, she was more comfortable in studying “like I always have.” Her lowest hours studied rating was for data week three, and then shows an increase in hours studied around mid-term time frame, data weeks four and five, and then again as the semester was ending, data week eight.

In summary, Shauna’s overall anxiety decreased and there was a general increase in her SUE, DOC, and GPA. Unpredictably, there was an overall increase in her SUD and her State anxiety scores. It may be important to note that Shauna’s boyfriend was deployed to the war in Iraq and she was quite concerned about him. She also reported being somewhat distressed that our sessions were ending, which may explain the increase in SUD and State anxiety. Once treatment had begun, Shauna reported feeling symptom relief almost immediately. After session three when the PMR was introduced, she reported feeling more relaxed and more at ease in all areas. Shauna was given a script and was instructed to practice PMR at home, which she did regularly and continued to do even after our sessions ended.

Table 4.7
Shauna’s Test Anxiety Hierarchy

<table>
<thead>
<tr>
<th>Item</th>
<th>SUD rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Starting a new semester</td>
<td>1</td>
</tr>
<tr>
<td>2. Syllabus – putting tests/requirements in planner</td>
<td>3</td>
</tr>
<tr>
<td>3. Going to Arabic class and not understanding everything in Arabic</td>
<td>5</td>
</tr>
<tr>
<td>4. Reviewing/studying for tests in other classes (not Arabic)</td>
<td>6</td>
</tr>
<tr>
<td>5. Reviewing for Arabic test one week out – review guide (lots to know)</td>
<td>6</td>
</tr>
<tr>
<td>6. Taking the test in other classes</td>
<td>7.5</td>
</tr>
<tr>
<td>7. Speaking in class in Arabic</td>
<td>7.5</td>
</tr>
</tbody>
</table>
Table 4.7 – Continued

8. Getting into the classroom on test day and everyone else is calm 9
9. Getting the test 9.5
10. First page of test 9.5
11. Second page of test, thinking “how am I supposed to answer this”? 10
12. Other thoughts come in while I am taking the test – can’t get rid of them! 10
13. Skipping sections on the test 10
14. Going back to the whole skipped section 10
15. Turning in the exam 10
16. Oral exam 10

Figure 4.53
Shauna’s GPA
First TAI and STAI administrations were during the initial meeting, second administrations were mid-term time frame, third administrations were final treatment session, and the fourth administrations were at the follow-up session.

Figure 4.54
Shauna’s TAI Scores
Figure 4.55
Shauna’s TAI-W and TAI-E Scores
Shauna’s State and Trait Inventory Percentiles

Figure 4.56
Shauna’s STAI Scores
Data Week one was for the week after the after initial session, Data Week five was for the week after midterms and after SD had been introduced, and Data Week eight was week for the week prior to the last session.

Figure 4.57
Shauna’s SUD Scores
Figure 4.58
Shauna’s SUE Scores
Figure 4.59
Shauna’s DOC Scores
Case number six - Tamika:

Tamika was a 20-year old African-American female. She was a junior Mechanical Engineering major at Florida State University. Tamika had never been diagnosed with a learning disorder, though she had been referred to the ALEC for evaluation, where it was determined that her academic challenge was due primarily to test anxiety.

Tamika was referred to the ALEC for evaluation for a suspected math learning disorder. In the interview, it was determined that Tamika’s symptoms more closely resembled test anxiety. Tamika was referred to test anxiety treatment. She agreed to receive treatment for her test anxiety as part of a research study. She was excited to resolve her academic problems as she was in jeopardy of losing her Bright Futures academic scholarship, which put more pressure on her and resulted in even more anxiety.

Tamika reported that these feelings of academic anxiety had been a part of her life “since high school.” Tamika reported being very goal oriented and admitted to putting a great deal of pressure on herself academically. Tamika believed that the test anxiety was most pronounced in her math classes, though she also reported enjoying math and science the most. Tamika reported that she worried "all the time"; and, because of this excessive
worry, she had difficulty remembering information during exams that she had previously learned. Tamika also reported that she had difficulty sleeping, especially before an exam, and that she often had feelings of hopelessness. Tamika endorsed many symptoms that also could also be indicative of generalized anxiety such as her chronic, generalized worry and her feelings of hopelessness. Tamika was encouraged to seek outside counseling for these generalized anxiety symptoms.

Tamika’s test anxiety sessions followed the treatment manual, and she began collecting data after the first session (data week zero) and continued collecting data through the ninth session (data week eight). In the second session, Shauna worked hard on constructing a test anxiety hierarchy and assigning a SUD to each step (Table 4.8). The PMR was taught beginning the third session and, in a slight modification to the treatment manual, only a brief introduction to SD was begun in the fifth session, which fell at mid-term time. This modification took place because Tamika had difficulty engaging in the PMR as she reported being unable to “relax.” After three sessions of PMR, she was able to relax “a little” and the SD was started. Due to the slow response to PMR, SD was started very slowly and only with items on her hierarchy with an SUD rating lower than five. As the sessions continued, she was able to get into the higher-rated items. However, when she got to the items on her hierarchy with an SUD rating of nine or higher, they had to be attempted two or three times before Tamika could completely relax. In the end, Tamika was able to successfully complete all items on her hierarchy and stayed receptive and committed to the process.

Tamika’s semester GPA decreased somewhat during the semester that she was seeking test anxiety treatment and then increased the next semester after treatment. Tamika sought TA treatment the semester after she began her junior year and began the course work in her major area of study. It was during this course work that she began to see her grades slip. Once she got further into her major area of study, the classes became more challenging to her and her grades slipped further. She was able to bring her grades up a bit during the semester after treatment. This may be due to the fact that she had learned how to keep her test anxiety under control and could then perform at her actual ability level. This may explain the increase in GPA she experienced the semester after treatment. On a personal level, Tamika was very concerned about losing her Bright Futures scholarship; this additional worry served to exacerbate her anxiety and may also have contributed to the decrease in her GPA.

Four of five of Tamika’s anxiety scores showed continuous improvement. Her TAI scores fell throughout the course of treatment and continued falling after the treatment sessions ended, as indicated by her follow-up session scores, which is TAI administration number four. Tamika’s TAI-W and TAI-E scores show this same pattern. Tamika’s state and trait anxiety scores both showed a decrease from the first administration to the second, but then her state anxiety scores increased at the end of treatment administration; administration number three is the last day of treatment. It is hypothesized that Tamika was upset about sessions ending and this affected her state anxiety answers. Her trait anxiety scores, on the other hand, showed a continual decrease upon each administration.

Tamika’s subjectively reported data showed idiosyncratic fluctuation. Her highest SUD score occurred in data week two, and her lowest score occurred the next week in data week three. There was an increase in data week four and then a decline again in data week eight. Shauna worked hard on constructing a test anxiety hierarchy and assigning a SUD to each step (Table 4.8). The PMR was taught beginning the third session and, in a slight modification to the treatment manual, only a brief introduction to SD was begun in the fifth session, which fell at mid-term time. This modification took place because Tamika had difficulty engaging in the PMR as she reported being unable to “relax.” After three sessions of PMR, she was able to relax “a little” and the SD was started. Due to the slow response to PMR, SD was started very slowly and only with items on her hierarchy with an SUD rating lower than five. As the sessions continued, she was able to get into the higher-rated items. However, when she got to the items on her hierarchy with an SUD rating of nine or higher, they had to be attempted two or three times before Tamika could completely relax. In the end, Tamika was able to successfully complete all items on her hierarchy and stayed receptive and committed to the process.

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Four of five of Tamika’s anxiety scores showed continuous improvement. Her TAI scores fell throughout the course of treatment and continued falling after the treatment sessions ended, as indicated by her follow-up session scores, which is TAI administration number four. Tamika’s TAI-W and TAI-E scores show this same pattern. Tamika’s state and trait anxiety scores both showed a decrease from the first administration to the second, but then her state anxiety scores increased at the end of treatment administration; administration number three is the last day of treatment. It is hypothesized that Tamika was upset about sessions ending and this affected her state anxiety answers. Her trait anxiety scores, on the other hand, showed a continual decrease upon each administration.

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week five after SD had been introduced. Tamika’s SUD scores then began increasing in data week seven as she neared the end of the semester and the end of treatment. Tamika’s SUE ratings were rather consistent and showed an overall pattern of increase. Her lowest rating of efficiency was reported during the second data week, and her highest rating was reported for the fifth data week, after SD was introduced. Tamika’s DOC scores also showed limited variability. Her lowest score was reported during data collection week four, which was near mid-term time frame and prior to the introduction of SD. After her lowest rating, her scores showed an increase for the next two weeks and then declined in data week seven before reaching her highest rating for data week eight. Data week four, or session number five, is when SD was introduced; and working through the anxiety hierarchy may have facilitated her feeling more competent about school. Tamika’s hours studied also fluctuated over the course of treatment, with her highest rating being reported for data week one. Her lowest hours studied was for data week three. She showed an increase in hours studied around the mid-term time frame, data weeks four and five, and then again as the semester was ending, data week eight.

In summary, Tamika’s overall anxiety decreased and there was a general increase in her SUE, DOC, and GPA, and an overall decrease in her SUD. During treatment, Tamika did not report feeling symptom relief until after beginning the SD in the fifth session. Tamika was given a script and was instructed to practice PMR at home, which she did “when I have the time.”

Table 4.8
Tamika’s Test Anxiety Hierarchy

<table>
<thead>
<tr>
<th>Item</th>
<th>SUD rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Registering for classes</td>
<td>3</td>
</tr>
<tr>
<td>2. Seeing how many tests there are in the class</td>
<td>5</td>
</tr>
<tr>
<td>3. Having to study for the first test (don’t know how the tests will be)</td>
<td>5</td>
</tr>
<tr>
<td>4. Seeing the class has a mid-term (I try to drop the class if so)</td>
<td>7</td>
</tr>
<tr>
<td>5. Teacher announces the date of the test (you know it is soon then)</td>
<td>7</td>
</tr>
<tr>
<td>6. Feeling unprepared (couple of days before the test – time slipping away)</td>
<td>8</td>
</tr>
<tr>
<td>7. Pushing other things aside to study for the test (now other stuff is slipping)</td>
<td>8.5</td>
</tr>
<tr>
<td>8. Working on the test</td>
<td>8.5</td>
</tr>
<tr>
<td>9. Waking up the morning of the test (want to go back to sleep!)</td>
<td>9</td>
</tr>
<tr>
<td>10. Receiving the test</td>
<td>9</td>
</tr>
<tr>
<td>11. Seeing other students finishing the test</td>
<td>9</td>
</tr>
<tr>
<td>12. Teacher counting down the time left on the test</td>
<td>9</td>
</tr>
<tr>
<td>13. Teacher collecting the test – turning it in</td>
<td>10</td>
</tr>
<tr>
<td>14. Getting the test back</td>
<td>10</td>
</tr>
<tr>
<td>15. Trying to sleep the night before the test (just want it over with)</td>
<td>10</td>
</tr>
</tbody>
</table>
Figure 4.61
Tamika’s GPA
First TAI and STAI administrations were during the initial meeting, second administrations were mid-term time frame, third administrations were final treatment session, and the fourth administrations were at the follow-up session.

Figure 4.62
Tamika’s TAI Scores
Figure 4.63
Tamika’s TAI-W and TAI-E Scores
Figure 4.64
Tamika’s STAI Scores
Data Week one was for the week after the after initial session, Data Week five was for the week after midterms and after SD had been introduced, and Data Week eight was week for the week prior to the last session.

Figure 4.65
Tamika’s SUD Scores
Figure 4.66
Tamika’s SUE Scores
Figure 4.67
Tamika’s DOC Scores
Case number seven - Natalie:

Natalie was a 23-year old Caucasian female. She was a junior Psychology major at Florida State University. Natalie had never been diagnosed with a learning disorder and believed that her academic problems resulted from test anxiety, though she also reported a more generalized type of anxiety as well.

Natalie contacted the ALEC after hearing about the test anxiety treatment program being offered. She agreed to be a part of the research program and scheduled an appointment immediately. She reported being “very excited” to start the treatment program as she believed that she had begun “having panic attacks.”

Natalie reported that she had been experiencing test anxiety for about a year prior to seeking treatment, and her panic attack symptoms had started approximately three months prior to seeking test anxiety treatment. Natalie believed that the test anxiety was present in all her classes and not concentrated in any one area, though her public speaking classes and having to give class presentations in any class were the worst for her. Natalie reported that, she would “forget” the information when taking exams or giving a
presentation, even after she had prepared adequately. Natalie reported that when she had to give a speech or play the piano in front of people, she would begin to experience the physical symptoms of rapid heart beat, dizziness, shallow and rapid breathing, and sweating. Natalie also reported that she had difficulty sleeping and eating due to her anxiety.

Natalie’s test anxiety treatment sessions followed the treatment manual, and she began collecting data after the first session (data week zero) and continued collecting data through the ninth session (data week eight). In the second session, she worked on constructing a test anxiety hierarchy and a general-anxiety hierarchy, as she was having difficulty separating the two areas. She was encouraged to seek outside counseling for her more generalized anxiety and panic disorder. During this second session, she also assigned a SUD to each item on the test anxiety hierarchy (Table 4.9). The PMR was taught beginning the third session and SD was begun in the fifth session, which fell at mid-term time. Natalie did not experience any difficulty engaging in the PMR or the SD. However, when she got to the items on her hierarchy dealing with public speaking or public performances, she had to attempt them at least twice. Natalie moved slowly through her hierarchy as many of her items had ratings of 9.0 and 10.0. Ratings of 10.0 indicated the highest possible level of anxiety. This made for a slower progression, though this allowed her to cover all of the items that were distinctly troubling. She stayed very committed, receptive, and hard working throughout the process.

Natalie’s semester GPA improved the semester that she was seeking test anxiety treatment and continued to improve the semester after treatment. Natalie reported feeling less anxious almost immediately after the treatment sessions began. It is believed that once Natalie learned how to control and treat her anxious symptoms she was able to better focus on school and do better academically.

Natalie’s anxiety scores all showed improvement. Her TAI scores fell after the second administration, which occurred during the fifth session when SD was introduced, and continued to decrease even after the treatment session ended, as indicated by her follow-up session scores, which is TAI administration number four. Natalie’s TAI-W and TAI-E showed an overall decrease, though her TAI-W scores continually decreased and her TAI-E scores showed more variability, with the scores increasing in administration number two before falling in administration number three, at the end of treatment, and then remaining constant at the follow-up administration six-months later. Natalie’s state and trait anxiety scores both showed an increase from the first administration to the second; but then her trait anxiety scores begin a continuous decrease, while her state anxiety scores continue to increase in administration number three before decreasing in the follow-up administration, but were unpredictably never as low as her original rating. It is believed that Natalie was upset about the treatment sessions ending and this affected her state anxiety answers. Her trait anxiety scores, on the other hand, showed a continual decrease upon each administration.

Natalie’s subjectively reported data showed idiosyncratic fluctuation. Her SUD scores were lowest at the end of the treatment sessions (data week eight) and highest during the second data week. Her SUD scores fell during the third data week and then increased through the sixth data week, which spanned the mid-term time frame. Her scores then began to decrease to her lowest scores during treatment. Her SUE scores also showed fluctuation, with her highest score occurring during data week five, which was
after mid-terms, and after SD had been introduced. Natalie’s lowest SUE rating was for the first data week, before any test anxiety treatment had begun. Her SUE scores showed an overall pattern of improvement as the treatment program progressed. It is this author’s belief that Natalie began to feel more efficient as the treatment sessions progressed and peaked after the introduction of SD during session five. Natalie’s DOC scores also showed variability with an overall trend of improvement. Her highest scores were reported during data week five, after mid-terms and after SD had been introduced, and for data week eight, the end of treatment. Natalie’s lowest score was reported for data week three, which is prior to the introduction of SD. SD is taught during session five, which aligns with data week four; and her scores showed a clear pattern of improvement after that point. It is believed that, as she worked through the items on the anxiety hierarchy, she began to feel more competent and less anxious about school, her social interactions, and speaking in public. Natalie’s hours studied also fluctuated over the course of treatment, with her highest rating being reported for data week three, prior to the mid-point in the semester, which also aligns with her lowest DOC rating. Her hours studied then dropped for the next week before increasing again in data week five. Her hours studied stayed rather consistent for the last three data collection weeks.

In summary, Natalie’s overall anxiety decreased and there was an overall increase in her SUE, DOC, and GPA. There was also a general decrease in her SUD over the course of treatment. Once treatment began, Natalie reported feeling symptom relief almost immediately. After session three when the PMR was introduced, she reported feeling more relaxed and more at ease in all areas, including school and social situations. She reported that she had not had a “panic attack” since the test anxiety treatment had begun. Natalie was given a script and was instructed to practice PMR at home, which she did regularly and continued to do even after the sessions ended.

Table 4.9
Natalie’s Test Anxiety Hierarchy

<table>
<thead>
<tr>
<th>Item</th>
<th>SUD rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Signing up for class</td>
<td>1</td>
</tr>
<tr>
<td>2. Seeing that the class is a big class – lots of people</td>
<td>3</td>
</tr>
<tr>
<td>3. Raising hand in class (to ask a question)</td>
<td>5.5</td>
</tr>
<tr>
<td>4. Reviewing for the test in class</td>
<td>5.5</td>
</tr>
<tr>
<td>5. Walking into the class the day of test</td>
<td>8.0</td>
</tr>
<tr>
<td>6. Studying for the test</td>
<td>9.0</td>
</tr>
<tr>
<td>7. Turning the test in</td>
<td>9.5</td>
</tr>
<tr>
<td>8. Taking a test</td>
<td>10</td>
</tr>
<tr>
<td>9. Having to talk in public – give a speech</td>
<td>10</td>
</tr>
<tr>
<td>10. Being called on in class (to give an answer)</td>
<td>10</td>
</tr>
</tbody>
</table>
Natalie’s Grade Point Average

Figure 4.69
Natalie’s GPA
First TAI and STAI administrations were during the initial meeting, second administrations were mid-term time frame, third administrations were final treatment session, and the fourth administrations were at the follow-up session.

Figure 4.70
Natalie’s TAI Scores
Figure 4.71
Natalie’s TAI-W and TAI-E Scores
Figure 4.72
Natalie’s STAI Scores
Data Week one was for the week after the after initial session, Data Week five was for the week after midterms and after SD had been introduced, and Data Week eight was week for the week prior to the last session.

Figure 4.73
Natalie’s SUD Scores
Figure 4.74
Natalie’s SUE Scores
Figure 4.75
Natalie’s DOC Scores
Case number eight - Tammy:

Tammy was a 40-year old Caucasian female. She was a sophomore Business major at Tallahassee Community College. Tammy had never been diagnosed with a learning disorder and believed that her academic problems resulted from test anxiety, though she also reported a more generalized type of anxiety as well.

Tammy contacted the ALEC after hearing about the test anxiety treatment program being offered. She agreed to be a part of the research program and scheduled an appointment immediately. She reported being very eager to start the treatment program as she was very frustrated with the problems she was experiencing with her math classes. Additionally, she was concerned with her decision to quit her job and return to school “at my age.” Reportedly, Tammy’s family did little to support her decision and often ridiculed her for it. As a result, Tammy reported being dissatisfied with herself, and feeling “like a failure.” She engaged in a great deal of social referencing. She continuously compared herself to the more traditional students and graduate students, which served only to upset her. Tammy was applying for admission into Florida State University’s Business School and, as such, was putting more pressure on herself to achieve good grades. Tammy was encouraged to seek additional counseling for her more generalized anxiety and depressive symptoms.
Tammy reported that these feelings of academic anxiety began when she returned to school two years ago. Tammy believed that the test anxiety was present in all her courses but most pronounced in her math classes. Tammy reported that she would “forget everything I studied” on exams and that she would start to “think of how badly I am doing on the test until I make myself cry” during exams. Physically she reported that she experienced muscle tension and shaking and an increased heart rate.

Tammy’s test anxiety treatment sessions followed the treatment manual, and she began collecting data after the first session (data week zero). In the second session, she attempted to construct a test anxiety hierarchy (Table 4.10) but broke down crying several times during the session. She was instructed to take it home and work on it over the next few weeks until it was needed in session five. The PMR was taught beginning the third session and SD was to begin the fifth session, which fell at mid-term time. Tammy had difficulty relaxing and often times she would cry during the PMR sessions.

Tammy missed her fifth session, though she submitted her data sheets. Two make-up appointments were attempted, with Tammy canceling them both at the last minute and then finally she stopped returning phone calls. Tammy attended four sessions and submitted four weeks of data. She gave no reason for discontinuing treatment. Tammy quit coming to treatment before she was given a second TAI or STAI, so no comparisons can be made of her scores.

Tammy’s semester GPA decreased somewhat during the semester that she was seeking test anxiety treatment and then was unreported the next semester. Tammy was in her second year of an Associate’s Program. She reportedly felt overwhelmed by the pressure of school and returning to school as a non-traditional student; she also had very little family support for her decision to return to school, which exacerbated the stress she experienced.

Tammy’s subjectively reported data was provided for four data weeks; her last data was provided the week she was to begin SD. Her SUD scores dropped over the course of treatment and were highest during the first data collection week and lowest for the fourth data collection week, which turned out to be her last week of treatment. Tammy’s SUE scores showed a consistent decline as treatment and the semester progressed, indicating that she was feeling less and less efficient in her studying; and her DOC scores also showed an overall decline. It appears that her feelings of competence and efficiency where decreasing as the semester advanced. It is this author’s belief that Tammy felt efficient and competent at the beginning of a new semester and prior to experiencing failure in her math classes once again. It is suspected that failure took over and the treatment was unable to make a difference for Tammy. It is unknown what may have happened if she had been able to continue treatment. Tammy’s hours studied also fluctuated over the course of treatment, with her highest rating being reported for data week three, or session four, prior to the mid-point in the semester; this also aligns with one of the lowest DOC ratings. Her hours studied then drop for data collection week four, which is the last data week reported for Tammy. It is this author’s belief that Tammy essentially gave up on herself and school. There is, in fact, no record of her attending school the next semester.
In summary, Tammy’s SUD decreased, which is favorable; but her SUE, DOC and GPA also decreased, which are not favorable signs. It is unknown what would have happened had Tammy been able to complete the TA treatment program. Tammy was distressed about being a non-traditional student and believed that her age worked against her academically. It had been many years since she had taken any academic classes, and she had not met with much success while in her Associates program. Perhaps her pattern of failure made her anxiety too great for her to deal with at that particular point in time. Before stopping treatment, Tammy was given a script and was instructed to practice PMR at home, which she reported she did occasionally.

Table 4.10
Tammy’s Test Anxiety Hierarchy
(Incomplete)

<table>
<thead>
<tr>
<th>Item</th>
<th>SUD rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Signing up for classes</td>
<td>3</td>
</tr>
<tr>
<td>3. Starting a new semester</td>
<td>5</td>
</tr>
<tr>
<td>4. Getting the syllabus</td>
<td>5</td>
</tr>
<tr>
<td>5. Studying (daily)</td>
<td>5</td>
</tr>
<tr>
<td>6. Sitting in classes – confusing, instructors aren’t clear</td>
<td>7</td>
</tr>
<tr>
<td>7. Studying for a test</td>
<td>8.5</td>
</tr>
<tr>
<td>8. Taking the test (essays are the worst, but all are bad)</td>
<td>10</td>
</tr>
<tr>
<td>9. Thinking about getting into FSU Business School</td>
<td>10</td>
</tr>
</tbody>
</table>

Proposed Items for Tammy’s hierarchy:

1. Seeking help from the teacher/tutor/friend
2. Test review in class
3. Looking over test material – that day
4. Waiting for the test to be passed out
5. Getting the test - starting
6. Coming to a question to which you do not know the answer
7. Finishing the test and having to turn in the test
Figure 4.77
Tammy’s GPA
First TAI and STAI administrations were during the initial meeting, second administrations were mid-term time frame, third administrations were final treatment session, and the fourth administrations were at the follow-up session.

Figure 4.78
Tammy’s TAI Scores
Figure 4.79
Tammy’s TAI-W&E Scores
Figure 4.80
Tammy’s STAI Scores
Data Week one was for the week after the after initial session, Data Week five was for the week after midterms and after SD had been introduced, and Data Week eight was week for the week prior to the last session.

Figure 4.81
Tammy’s SUD Scores
Figure 4.82
Tammy’s SUE Scores
Figure 4.83
Tammy’s DOC Scores
Case number nine - Alfred:

Alfred was a 17-year old African-American male who was diagnosed with a learning disorder approximately two years before seeking treatment for test anxiety. He was a high school senior.

Alfred was referred to ALEC for re-evaluation of his learning disability and possible tutoring. At this time, his parents were asked if he would like to receive treatment for his test anxiety as part of a research study. They agreed to test anxiety treatment as they believed this was a major issue for Alfred.

Alfred reported that he had only experienced test anxiety for about one year prior to treatment. The pressure of trying to get into college had placed a greater emphasis on his grades, and he worried that he may not be as “good at things” as other students. Alfred reported that tests worried him a great deal and that he “forgets” information when taking tests. Physically he reported having an upset stomach, muscle tension, and feeling jittery.

Alfred attended only the first session and then had many transportation issues and schedule conflicts. It is uncertain exactly why he discontinued treatment, though it should be noted that it was his mother who made the appointment and who was most interested in the treatment sessions, not Alfred.
First TAI and STAI administrations were during the initial meeting, second administrations were mid-term time frame, third administration were final treatment session, and the fourth administrations were at the follow-up session.

**Figure 4.85**
Alfred’s TAI Scores
Figure 4.86
Alfred’s TAI-W&E Scores
Figure 4.87
Alfred’s STAI Scores
CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FUTURE RESEARCH

Summary of the Study

The purpose of this study was to obtain a comprehensive picture of (a) the process of test anxiety, (b) the process of test anxiety treatment, (c) the timing of process changes in anxiety, confidence, and efficiency (d) the nature of changes across participants. In order to answer the research questions, the study used the following dependent measures: test anxiety scores, trait and state anxiety scores, GPA, and subjectively reported data that measured perceived levels of efficiency while studying (distress while studying, academic competence, and the number of hours studied). Additionally, an informal interview and case notes provided more in-depth information and a unique perspective from each of the participants.

As discussed in Chapter Two, there is a widely supported theory that test anxiety is a conditioned response to unsuccessful test-taking situations (Hembree, 1988; Hill, 1972; Sarason, 1980; Speilberger, Anton, & Bedell, 1976). This study operated from a behavioral perspective, e.g., that test anxiety is a conditioned response to test taking and, as a result, an alternative relaxation response to academic evaluation can be conditioned in individuals.

Throughout the study many acronyms were used, a complete listing is provided in appendix G, but the most common ones are listed here to facilitate the reader’s comprehension of the summary. The dependent measures used in this study include: the Degree of Competency (DOC) experienced in the participants’ courses, the Subjective Unit’s of Distress (SUD) experienced while studying, and the Subjective Units of Efficiency (SUE) experienced while studying and preparing for classes. The Test Anxiety Inventory (TAI) was used to determine the participant’s level of test anxiety, and is further divided into two sub-categories: the physical aspects of test anxiety, Emotionality (TAI-E) and the cognitive aspects of test anxiety, Worry (TAI-W) the cognitive aspects. The State and Trait Anxiety Inventory (STAI) was used to assess the participants’ level of state anxiety (level of anxiety experienced at that precise moment in time), and trait anxiety (level of anxiety typically experienced). Finally, the treatment program consisted of Progressive Muscle Relaxation (PMR) and Systematic Desensitization (SD).

Research Questions

The study posed fourteen research questions.
1. Will systematic desensitization (SD) combined with progressive muscle relaxation (PMR) be an effective test anxiety intervention for a small sample of selected participants, including students with a diagnosed learning difficulty and students with no diagnosed learning difficulties?
2. What is the process of change, over the nine-week period of the study, for distress, efficiency, competence, test anxiety, trait anxiety and state anxiety for each of the participants?

3. During the first five-weeks of treatment, when only PMR is being used, is improvement shown on any of the process measures (e.g., distress, efficiency, competence, test anxiety, trait anxiety, state anxiety)?

4. During the second four weeks of treatment, when both SD and PMR are being used, is improvement shown on any of the process measures (e.g., distress, efficiency, competence, test anxiety, trait anxiety, state anxiety)?

5. Are process differences evidenced across type of student (e.g., diagnosed learning difficulty and students with no diagnosed learning difficulties)?

6. How does hours-spent-studying change over the course of the treatment period?

7. Does time in the semester affect the amount of time spent studying?

8. Are differences in the time spent studying evidenced across type of student (e.g., diagnosed learning difficulty and students with no diagnosed learning difficulty)?

9. In general, do there appear to be different treatment effects across different areas (e.g., distress, efficiency, competence, test anxiety, trait anxiety, state anxiety)?

10. In general, do participants show differences in level of trait anxiety versus state anxiety?

11. In general, do participants show differences in level of emotionality versus worry?

12. At the end of treatment, are the participants experiencing improvement in the areas of distress, efficiency, competence, test anxiety, trait anxiety, state anxiety?

13. At the end of treatment, do participants report an improvement in academic performance as measured by GPA?

14. At a six-month post-treatment follow-up, is there continued improvement in test anxiety, trait anxiety, state anxiety, and GPA?

**Question #1:** Will systematic desensitization (SD) combined with progressive muscle relaxation (PMR) be an effective intervention for test anxiety, for a small sample of selected participants, including students with a diagnosed learning disability and non-learning disabled students?

In this study, for these individuals, SD combined with PMR seems to be an effective intervention for test anxiety. The majority of the measures used to assess test anxiety and its related symptoms showed improvement for these participants, as did the measures of state and trait anxiety, and GPA measurements.

**Question #2:** What is the process of change, over the nine-week period of the study, for distress, efficiency, competence, test anxiety, trait anxiety and state anxiety for each of the participants?

This question was addressed for each individual in the case study section of Chapter Four. In general, there was an overall pattern of decline in SUD scores and an increase in SUE and DOC scores over the course of treatment that became most noticeable after SD was introduced into the treatment program. These changes appeared to diminish as the treatment sessions came to an end and the end of the semester approached; however, there were idiosyncratic fluctuations in each of these measures. It is important to note that five of seven participants directly mentioned their distress about the sessions ending, and Tammy’s SUE and DOC scores began to worsen prior to her
early termination, impending termination (premature or not) could have very well been a factor in anxiety scores and SUD scores increasing, and SUE and DOC scores decreasing. This suggests that the effect of being in treatment should not be diminished.

In general, the anxiety measures showed continuous improvement with many of the participants showing improvement even after the treatment sessions ended. Of the seven participants who finished the treatment program and returned for a follow-up session, everyone continued practicing the PMR except two, James and Matt. At follow-up, James’ anxiety scores increased, and his GPA had declined from his GPA high the semester of treatment. This indicates that the PMR and the SD helped the other participants (James included) lower their test anxiety and improve their academic achievement. This suggests that the PMR and SD were crucial variables in controlling test anxiety and the correlates of that anxiety. Those who continued the practice of PMR continued to improve. Matt did not continue the PMR practice either, but the findings were different for him. All of Matt’s anxiety scores continued to decline; however, it should be noted that he had withdrawn from school and was very happy with his decision to withdraw. Therefore, his academic anxiety was likely lower as he wasn’t taking any tests and his state anxiety was likely lowered since, as a student, taking tests and studying seem to encompass one’s whole life, one’s constant state. This finding seems to suggest that the continued practice of PMR facilitated a continued decrease on the anxiety measures. This may further suggest that this treatment method could be used as a preventive measure for future test anxiety.

Question #3: During the first five-weeks of treatment, when only PMR is being used, is improvement shown on any of the process measures (e.g., distress, efficiency, competence, test anxiety, trait anxiety and state anxiety)?

In general, the process measures do not show improvement during the first five-week period when only PMR is being used. This supports Zettle’s (2003) research, which found that systematic desensitization was the only treatment that significantly reduced trait anxiety. The one exception was the SUD measure. The Average SUD score began to decline immediately and then began increasing again around the time of mid-terms. This may suggest that the participants began to experience less distress once they began seeking treatment. On the other hand, the efficiency ratings and the competency ratings of the participants show a decline over the first five treatment sessions as mid-terms approach and before SD is introduced.

There is likely more than one factor that contributes to the lack of improvement shown in the process measures for the first five weeks. The first potential factor may simply be time in the semester; with mid-terms approaching the participants may have a natural increase in anxiety symptoms and a decrease in their perceived efficiency and competence. Another potential factor may be that SD is not introduced until the second four weeks in the treatment program. While PMR provides a relaxation technique for the participants to use, it does not provide them with the exposure component that SD does. Systematic desensitization was specifically designed to condition a relaxation response to a feared situation. In SD the participant is exposed, through the visualization process, to the feared situations or the feared objects while remaining in a relaxed state. This process allows the relaxation response to become the conditioned response to the previously feared situation or object (Bourne, 2000; Wolpe, 1958; Zeidner, 1998; Zettle, 2003).
**Question #4:** During the second four weeks of treatment, when both SD and PMR are being used, is improvement shown on any of the process measures (e.g., distress, efficiency, competence, test anxiety, trait anxiety, state anxiety)?

These measures seemed to show the most notable improvement during the second four week period, which is also after SD had been introduced into the treatment program. There was a general pattern of improvement that seemed to show the greatest improvement after SD was introduced. However, SD was introduced the week of mid-terms, so the fact that mid-terms were concluded may have also contributed to the improvement in scores. Additionally, there seemed to be a leveling off in the improvement of the SUD, DOC, and SUE scores as the treatment sessions came to an end. It is important to note that, as the sessions came to an end, the end of the semester and finals were also approaching and may have played a role in the change in these scores.

**Question #5:** Are process differences evidenced across type of student (e.g., diagnosed learning difficulty and non-learning difficulty)?

The process differences observed in this study seem to be more a product of individual difference than type of student. Many unique issues occurred during treatment for each of the participants. These unique issues seemed to play a greater role in the observed process differences than learning difficulty status. For example, Abby was diagnosed with Generalized Anxiety Disorder and prescribed Paxil during the course of treatment; while this may have decreased her anxiety and her distress she reported being upset about being prescribed medication and did not enjoy many of the side-effects, which may have actually increased her distress. Two out of three of Tammy’s subjective process measures showed continual worsening; however, she reported having no family support for her decision to return to school, and engaged in social comparisons regarding her age and her academic accomplishments. Shauna experienced variations in the beginning as she moved from hotel room to hotel room while they renovated her sorority house, and she showed variations that reflected her concern for her boyfriend in the war in Iraq. Tamika’s process measures were likely affected by her mother’s illness and the trips she was then required to make home during the semester, especially that particular semester when she had just begun taking classes in her major. In terms of type-of-student, none of these individuals had a diagnosed learning disability; however, Matt and David did, and they both had unique issues as well. Matt struggled with school and had fluctuations in his process measures that seem to reflect where he was in the decision making cycle concerning his continued enrollment. David was coming to the end of his college career and wondered what he would do upon graduation.

It is interesting to note that the two individuals with a diagnosed learning difficulty (David and Matt) did have the two highest reported initial TAI scores. However, neither Matt nor David had the highest SUD rating or highest hours studied, nor did either of them have the lowest SUE scores, DOC scores, or GPA. Along with having the highest initial TAI scores, these two participants were also both male, both Caucasian, both traditional students, and both had reported experiencing debilitating test anxiety their entire academic career. These findings seem to support the previous research that states that students with learning difficulties are more prone to test anxiety than their typically achieving peers (Bryan, et al, 1983; Hill, 1972; Hoy et al., 1997; Rizzo & Zabel, 1988, Swanson & Howell, 1996).
Conversely, the two participants who reported the lowest Initial TAI scores were
Natalie and Shauna. They were both female, Caucasian, traditional students, juniors,
neither had learning difficulties; both had been experiencing test anxiety for less than one
year; and, interestingly, both had the lowest TAI-W scores. Research suggests that it is
increased anxiety in the cognitive component (TAI-W) that is most consistently
associated with a decline in performance (Hembree, 1988; Morris, Davis, & Hutchings,
1981; Schwarzer, 1984; Spielberger & Vagg, 1995). Low TAI-E scores are consistent
with Natalie’s high GPA and Shauna’s attainment of the second highest GPA for the
semester after treatment. These findings also appear to support the research that suggests
there is a significant relationship between test anxiety and intelligence. Nyland et al.,
(2000) reported on Kenekar's 1977 findings that test anxiety showed no effect on
achievement for the students with higher ability. McCann & Meen (1984) found that
anxiety and achievement were positively correlated in the high intelligence group.

One commonality reported by each of the participants were the physical symptoms
of test anxiety, they all experienced some physical indicator of anxiety. Hembree (1988)
found that worry (cognitive manifestations) is experienced only after noticing heightened
levels of physiological arousal (Hembree, 1988, Morris, Davis, & Hutchings, 1981;
Schwarzer, 1984; Spielberger & Vagg, 1995). It is also suggested that physiological
manifestations are lessened when confidence is held high (Deffenbacher, 1980). We see
that in this study as well. In general, as the DOC scores increased, the TAI-E, TAI-W,
and the overall TAI scores decreased.

Finally, as addressed in Research Question number two, the major difference in
follow-up test anxiety, state anxiety, and trait anxiety outcome was not between students
with or without learning difficulty, but rather, was determined by those who continued to
practice PMR after the treatment sessions ended. In fact, the one subject who did not
continue practicing PMR not only had heightened levels of anxiety, he also had the
lowest reported GPA for the semester after treatment.

Question #6: How did hours spent studying change over the course of the
treatment period?

Hours spent studying showed individual differences and no discernable pattern
from which findings could be drawn. These individual differences were numerous, and
included, having an exceptionally challenging semester, beginning work in their major
area of study, the threat of losing a scholarship, outside employment, moving mid-
semester, having to make unexpected trips home, extracurricular activities, and personal
challenges. It has been speculated that one participant (Abby) may have briefly given-up;
as she essentially quit studying for two weeks after experiencing high SUD and low SUE
scores. It was also shown that three (David, Natalie, and Tammy) of the seven
participants had their highest number of hours studied the same week(s) they reported
their lowest DOC scores, all of which occurred between the third and fifth data weeks
(fourth and sixth sessions). This suggests that all these individuals responded differently
(individually) to lowered feelings of competency and efficiency and increased feelings of
distress. Additionally, having to record the number of hours studied may have affected
this variable due to certain expectations they had or believed that the examiner had.
Logging the number of hours they studied brought their study habits to their attention and
they may have worried that the examiner would make judgments about them based on
their reported study habits. In fact, one participant (Shauna) commented on the need to
study more because of the log. Therefore, it can not be determined whether the treatment program affected the number of hours studied.

**Question #7: Does time in the semester affect the amount of time spent studying?**

As discussed in Research Question number six, there were considerable individual variations in the number of hours studied. In general, midterm exams and final exams seemed to affect hours studied more than treatment variables. However, there was no one week that yielded the highest number of hours studied for all of the participants; instead, there were individual variations. A limitation of the study is that it was not possible to separate the time effect from the treatment effects.

**Question #8: Are differences in time spent studying evidenced across type of student (e.g., diagnosed learning difficulty and non-learning difficulty students)?**

The fluctuation in time spent studying appeared to be uncorrelated with the presence of a learning difficulty. The fluctuation appeared to be more related to the individual’s study habits and individual factors. For example, David, who has a diagnosed learning difficulty, had the second highest hours spent studying (19.31) and Matt, who also had a diagnosed learning difficulty, had the second lowest hours spent studying (9.45). Additionally, unique factors relevant to each of the individuals who participated in this study played a role in the number of hours they studied, e.g., Matt, Abby, and Shauna complained of not having enough time to study due to their extracurricular activities, which ranged from sports, outside employment, sorority obligations, relocating, and work study opportunities. Tamika felt pressured to study so that she would not lose her Bright Futures scholarship, but also felt an obligation to make trips home to visit her sick mother. Without these obligations each of their hours studied may have increased, and with more challenges in their lives the hours studied may have decreased. It is hard to speculate on this; however, the differences in hours studied seem to be more tied to individual issues that learning difficulty status.

**Question #9: In general, do there appear to be different treatment effects across different areas (e.g., distress, efficiency, competence, test anxiety, trait anxiety, state anxiety)?**

Each of the areas, SUD, SUE, DOC, test anxiety, and state and trait anxiety are looked at individually in Chapter Four’s discussion by dependent variable. In general, it seemed as though all three TAI scores (overall, TAI-E, and TAI-W) were most consistent, whereas state and trait anxiety showed more fluctuation, and average trait anxiety, showed an increase from the first to second administration. Of the subjectively reported process measures, DOC appeared to be the most consistent in improvement. Both SUD and SUE improved in general; however, there was variation in the results. However, there do not appear to be prominent differing effects across the different areas. In general, each of the areas, for these participants, showed improvement with the treatment program.

**Question #10: In general, do participants show differences in level of trait anxiety versus state anxiety?**

There did not appear to be a consistent correlation between the state and trait anxiety scores. Two of seven participants showed patterns of scores that closely resembled each other, e.g., if their state anxiety was low, so was their trait anxiety, and when one declined so did the other. However, five of seven participants showed no such pattern.
In general, trait anxiety scores improved (e.g., dropped) over the course of treatment; and after the mid-point administration in session number five, there was a continual dropping of scores, thus showing lower levels of trait anxiety with each administration of the STAI measure. This finding is in line with Zettle’s (2003) findings. He found that systematic desensitization significantly reduced trait anxiety. Further, each subject’s follow-up trait anxiety scores were lower than the initial and mid-point scores. However, the state anxiety scores varied widely and showed no discernable pattern. State anxiety appears to show an idiosyncratic fluctuation, and this author was unable to determine a relationship between state anxiety and the TA treatment program. Based on past research (e.g., Hong & Karstensson, 2002; O'Neil & Fukumura, 1992) it is widely believed that state anxiety is less stable than trait anxiety and can easily be brought about by different situations; therefore, one would not expect a test anxiety specific treatment program to have a direct effect on underlying predispositional states such as state anxiety.

Question #11: In general, do participants show differences in level of emotionality versus worry?

In Chapter Four the TAI-E and TAI-W scores for each individual are reported and the Average TAI-E and TAI-W scores reported; but in general, the participants’ TAI-E and TAI-W scores seem to show similar patterns, and seem to share similar percentiles. Typically, as the TAI-E scores decrease, the participants’ TAI-W scores decrease as well.

Question #12: At the end of treatment, are the participants experiencing improvement in the areas of distress, efficiency, competence, test anxiety, trait anxiety, and state anxiety?

The success of the treatment program in each of these areas is discussed in depth by both individual case study and dependent variable in Chapter Four. However, in general, the participants who completed the treatment program all experienced improvement in the outlined areas.

Question #13: At the end of treatment, do participants report an improvement in academic performance as measured by GPA?

In general, GPA showed an improvement in either the semester of treatment or the semester following treatment, all but one subject (Tamika) reported their highest GPA, of the three measures taken, for the semester of treatment or the semester after treatment. Tamika was struggling the semester she entered the anxiety treatment program as she had just entered her major area of study. Tamika was also experiencing increased anxiety at the thought of losing her Bright Futures scholarship and not being able to pay for college. These findings support both the research that indicates that there is a distinct relationship between test anxiety and academic performance, with students who experience high levels of test anxiety achieving at lower levels than their non-test anxious peers (Bryan, Sonnfeld, & Grabowski, 1983; Guttman, 1987; Hill & Sarason, 1966; Plass & Hill, 1986; Zatz & Chassin, 1985). Research also suggests that high evaluative threat (the thought of losing her scholarship if she doesn’t perform well) can bring about higher levels of test anxiety and subsequently lower levels of performance in students (Hancock, 2001; Stipek, 1998).

Question #14: At a six-month post-treatment follow-up, is there continued improvement in test anxiety, trait anxiety, state anxiety, and GPA?

As stated previously, Grade Point Average showed improvement in either the semester of treatment or the semester after treatment. Of the participants who showed
improvement in one of these two semesters half showed improvement the semester after treatment and half showed improvement the semester after treatment. In general, the participants who completed the treatment program all showed continued improvement in the various anxiety measures. The additional measures of SUD, SUE, DOC, and hours studied were not measured again at the follow-up session.

**General Findings**

**#1:** This study showed positive results for the use of PMR. Each of the participants who continued practicing the PMR after the treatment sessions ended continued to show improvement in decreasing their anxiety scores. This may indicate that the test anxiety treatment program could be used as a preventive measure for academic anxiety and perhaps other more generalized anxieties.

**#2:** Premature termination may have been caused in this study by age or motivation to attend treatment. Two of the nine participants did not complete the treatment program; one terminated after the initial session and another terminated after her fourth session, just before SD was to be introduced into the program. One difference in the two premature terminations was age; the youngest and the oldest terminated prematurely. It may also be important to determine motivation for treatment in further study of this area, as one of the participants who prematurely terminated the program was being made to seek treatment by his parents.

**#3:** The two participants in this study with a diagnosed learning difficulty, who completed the study, had the highest reported initial TAI scores. Besides sharing the highest TAI scores and learning difficulty status, David (100th percentile) and Matt (99th percentile) also shared highest TAI-W scores, (100th and 98th respectively) gender, race, traditional student status, and both reported that test anxiety had been a life-long problem for them. These findings are supported by the literature (Brinkerhoff, Shaw, & McGuire, 1993; Hill, 1996; Stolowitz, 1995, Swanson & Howell, 1996). Both David and Matt had lowered levels of perceived test anxiety, state anxiety, and trait anxiety, which suggests that this treatment program also works for individuals with a diagnosed learning difficulty.

**#4:** The two participants who reported the lowest initial test anxiety scores were Natalie (40th percentile) and Shauna, (54th percentile) neither of whom experienced a learning difficulty. These two also shared low TAI-E (50th and 61st percentiles respectively) gender, non-learning difficulty status, race, traditional student status, and experiencing test anxiety for one year or less.

**#5:** Shauna and Tamika reported the lowest follow-up TAI-E scores (16th percentile for both), which is interesting given that both of these Participants had significant personal distress during the semester of treatment, and both reported an increase in physical symptoms when describing the stress that these personal issues caused. Both reported early TAI-E scores above the 60th percentile, and at program completion they were reporting scores at the 16th percentile. The treatment program may have helped them lower the physical symptoms of the anxiety they were experiencing due to these personal situations as well.

**#6:** The participants individually constructed their own anxiety hierarchy and yet there were certain similarities among the hierarchies. For example, each of the
participants listed “registering for classes, or signing up for classes” on their anxiety hierarchy and for each of them the SUD assigned to this activity was a three or lower. Two rated this activity zero SUD, two rated it one SUD, and four rated it three SUD. Studying for the test was also listed on each of the participant’s hierarchies. The scores for studying for the exam ranged from six to nine, with the average rating being an eight. With anxiety levels in this range, it is speculated that the participants were unable to benefit from the study time as much as they would have with lower levels of anxiety. Six of the eight participants listed walking into the test on their hierarchies with a range from six to ten and the average being 9.7. It was no surprise that taking the test (or receiving the test) was on each of the participants hierarchies, or that it was rated as an SUD of nine or higher for seven of eight of the participants. Abby is the only one who rated taking the test lower than nine; she rated it 6.5 SUD. Another common theme among the hierarchies was the mention of being anxious about turning in the test. Five of the eight participants had this on their hierarchy and rated it at nine or higher.

Conclusions

There appears to be a correlation between the treatment program and anxiety: test anxiety, state anxiety, and trait anxiety; and the treatment program and GPA. Additionally, the treatment program appears to have facilitated improved feelings of competence and efficiency and relieved feelings of distress while studying, helping to improve the quality of life for the participants. From the field notes obtained it was obvious that the participants felt more and more at ease with their academic endeavors; and four of the seven who successfully completed the program reported a desire to go on to graduate school, an endeavor that three of them had not considered prior to treatment. It may also be inferred that continued practice of the PMR facilitated a continued decrease in anxiety and anecdotally many of the participants reported that it helped them work through “everyday” anxiety as well.

The field notes, comprehensive data collection, and the one-on-one interactions with the participants helped facilitate a richer understanding of the individual process of test anxiety and the individual process of test anxiety treatment. In this study, the case study design supported an in-depth examination in a natural school environment, and allowed this same level of insight into multiple participants with varying abilities, disability, and test anxiety levels. Case study research was quite appropriate for examining the construct of test anxiety as it applied to these select individuals, for studying how varying abilities affect test anxiety, and exploring how the outcomes were achieved in each of the participants. Additionally, the use of multiple cases allowed a broader examination of the construct of test anxiety and its treatment, especially with students of varying abilities. This research naturally lent itself to a case study approach, as it seemed to require the research to take place with-in a real-life context (natural school environment), where it would be hard to manipulate the evaluative threat the individual was feeling, or to control the level of difficulty of each participants semester. It would be difficult to conduct a randomized study hoping to obtain this same information. For example, it would be difficult to hold constant the myriad of individual differences such as level of anxiety, competitiveness of the classroom, time in the semester, number of tests, amount of studying one did, or the amount of PMR practice
that the subjects engaged in. Situations like these, where the behaviors cannot be manipulated, are well suited for a case study design. Additionally, topics that can best be understood within the context of their natural surroundings are often believed to be best suited for case study research (Babbie, 1995; Yin 2003).

Implications

One possible implication of these findings, that needs to be explored through future research, is that this test anxiety treatment regime of PMR and SD may be able to be used as a preventive measure for academic anxiety. It would be helpful to teach students how to manage academic anxiety before it became debilitating. A larger implication that could be gleaned from this study may be that this treatment program could be applied as a preventive measure for more generalized anxieties as well.

Limitations of the Study

Generalizability of the findings may have been affected due to the chosen sample and its small size. The sample was a convenience sample and many of the students who reported to ALEC that test anxiety was a debilitating issue chose not to undergo the intensive and time-consuming test anxiety treatment protocol; therefore, the students who did choose to participate may be inherently different than those who chose not to and may, subsequently, limit the generalizability of the findings. Additionally, the case study design, with its small sample size, limits the generalizability of the findings.

Bias may have been introduced into the study through the data collection technique, which was primarily self-report and may have produced a mono-method bias and socially desired responses. (Kazdin, 2003; Shadish, Cook, & Campbell, 2002). The TAI, STAI, DOC, SUD, SUE, and hours studied are all self-report measures that help determine level of test anxiety, state and trait anxiety, feelings of competence, distress and efficiency in academic endeavors. These measures are subjective and individualized, e.g., a SUD rating of 4 may be considered very low for one person, and yet debilitating for another. Furthermore, there may be confounding variables that unknowingly affected the participants’ test anxiety, state and trait anxiety, GPA, SUD, SUE, DOC, and hours studied. Also, based on the case notes taken, it is believed that the amount of hours studied and GPA are also a product of what is going on in the semester and in that person’s life, not just an anxiety measure. Additionally, the TAI and STAI were given four times in total; and as a result of anxiety being assessed frequently, there may be some test-treatment interactions. Also, the test anxiety inventory was really the only measure of academic anxiety being used (mono-operation bias) and self-report was the only form of measure (mono-method bias). When using self-report measures, there is always the possibility that the participants may have provided certain responses on the subsequent inventories based on feedback provided on the previous inventory, or socially desired responses.

Grade Point Average was also a measure that was used in the study. However, GPA may not be the best way to measure academic improvement (no immediate feedback); and it may have been an exceptionally hard semester or an exceptionally easy semester for the subject.
One other possible limitation of this study may have come from experimenter expectancy, which may have influenced the results obtained. Due to the lengthy and personal nature of the study, good rapport was built with each of the participants and they may have wanted to see the experimenter succeed, and the experimenter, in turn, may have wanted to see the participants succeed. However, standardized procedures had been established to ensure that there was no deviation due to reactivity or for individual differences.

Recommendations for Future Research

Future research on test anxiety should continue to focus on the more in-depth case study approach. This more comprehensive approach should include both qualitative and quantitative analysis when applicable. Additional research is needed to determine if the treatment program would be a viable preventive measure for all students and what improvement it would make in the lives of students without academic anxiety per se. Additionally, research on a longer, (perhaps semester long) treatment program would be beneficial to track the changes in the process measures over the course of an entire semester. This would help to determine more fully whether the process measures continue to change as the semester ends with impending final exams. Other research, with a larger sample size, could focus on determining if gender, ethnicity, having more generalized anxiety, or learning difficulty status plays a significant role in test anxiety, the change of the process measures over the course of treatment, trait and state anxiety, or overall response to the treatment program. Future research could also look at conducting a group treatment program to determine whether or not the individualized attention provided in this study was a crucial component in the participants’ improvement.
APPENDIX A:

IRB APPROVAL AND INFORMED CONSENT FORM
APPROVAL MEMORANDUM
Human Subjects Committee

Date: 4/14/2003

Laura Johnson
MC 4453

Dept.: Educational Psychology and Learning Systems

From: David Quadagno, Chair

Re: Use of Human Subjects in Research
Dissertation Pilot Study: Using Systematic Desensitization to treat anxiety a with learning disabled student

The forms that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and two members of the Human Subjects Committee. Your project is determined to be exempt per 45 CFR § 46.101(b) 2 and has been approved by an accelerated review process.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If the project has not been completed by 4/13/2004 you must request renewed approval for continuation of the project.

You are advised that any change in protocol in this project must be approved by resubmission of the project to the Committee for approval. Also, the principal investigator must promptly report, in writing, any unexpected problems causing risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols of such investigations as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Protection from Research Risks. The Assurance Number is IRB00000445.

Cc: Dr. Frances Prevatt
HSC No. 2003.172
INFORMED CONSENT FORM

I freely and voluntarily and without element of force or coercion, consent to be a participant in the research project entitled “Using Systematic Desensitization to treat test anxiety with a learning disabled student.”

This research is being conducted by Laura Eckler Johnson, M.S., who is a doctoral student in the department of Educational Psychology and Learning Systems at Florida State University. I understand the purpose of her research project is to better understand how to help learning disabled students cope with and treat test anxiety. As such, my data may be used for research purposes. In addition to being taught anxiety reduction techniques such as progressive body relaxation and systematic desensitization, I will be asked to provide subjective ratings of my feelings of anxiety, efficiency in studying and competency in regard to my classes, and tests that I will take. I will also be asked to provide my grades on said tests to the researcher, so that my pre-intervention and post-intervention academic performance can be compared.

I understand I will be asked to take a pre-test, mid-test and post-test to gauge both my test anxiety and my general anxiety level. The total time commitment would be about 50 minutes per week, for eight weeks. If I participate in the study, I will receive one-on-one treatment from the researcher for the eight weeks of the study. This treatment will include being trained in diaphragmatic breathing, progressive body relaxation, developing an anxiety hierarchy, and visualized systematic desensitization. The researcher agrees to provide an additional 4 sessions to be used if I need them. My questions will be answered by the researcher or she will refer me to a knowledgeable source. All sessions will be supervised by Dr. Frances Prevatt, who is a licensed clinical psychologist.

I understand that my data may be used for research purposes, and that my participation is totally voluntary and I may stop participation at anytime. If I decide to stop participation, I will no longer be entitled to the treatment sessions with this researcher. All my self-reported data, and any data collected about me, from my treatment file at the Adult Learning and Evaluation Center (ALEC) will be kept confidential and identified by a subject code number. My name will not appear on any of the results.

I understand there is a possibility of a minimal level of risk involved if I agree to participate in this study. I might experience anxiety when beginning the progressive body relaxation, or when practicing the systematic desensitization, especially during the visualization process. The researcher, or Dr. Prevatt, will be available to talk with me about any emotional discomfort I may experience while participating. I am also able to stop my participation at any time I wish.

I understand there are benefits for participating in this research project. First, my own awareness about relaxation and anxiety reduction may be increased. Also, I will be
learning techniques that I can apply in everyday situations to decrease my anxiety and
tension, possibly providing life-long benefits. Additionally, I am providing researchers
valuable insight into the learning disabled population and their ability to benefit from
treatments typically studied in the typical college population. This knowledge can assist
education specialists and psychologists in providing treatment options to the learning
disabled population.

I understand that this consent may be withdrawn at any time without prejudice,
penalty or loss of benefits to which I am otherwise entitled. I have been given the right to
ask and have answered any inquiry concerning the study. Questions, if any, have been
answered to my satisfaction.

I understand that the sessions may be audio or video-taped, in order for the
researcher to review her performance, and for her supervisor to ensure that she is
conducting the study with integrity. It has been explained to me that these tapes will
remain locked in a file cabinet in the ALEC, only the researcher will have access to these
tapes, and they will be destroyed no later than August 26, 2007.

I further understand that I may contact Dr. Frances Prevatt, Florida State
University, Department of Educational Psychology and Learning Systems 306 Stone
building (850) 644-9445, for answers to questions about this research or my rights. Pilot
study results will be sent to me upon my request.

Additionally, if I have questions about my rights as a subject/participant in this
research, or if I feel I have been placed at risk, I can contact the Chair of the Human
Participants Committee, Institutional Review Board, through the Office of the Vice
President for Research, at (850) 644-8633.

I have read and understand this consent form.

__________________________
(Participant’s name printed)

__________________________  (Date)
(Participant’s signature)  (Date)
APPENDIX B:

INTAKE FORM
Application for Test Anxiety Reduction Treatment

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Application for Test Anxiety Reduction Treatment Continued

Main Complaint:

Date hierarchy completed ____________________________________________

Date of 1\textsuperscript{st} TAI/STAI ______________________________________

Date of 2\textsuperscript{nd} TAI/STAI _______________________________________

Date of 3\textsuperscript{rd} TAI/STAI _______________________________________

Date of 4\textsuperscript{th} (follow-up) TAI/STAI ____________________________
APPENDIX C:

SCHEDULE OF DATA COLLECTION AND TREATMENT TIMELINE
Table C.1  
Data Collection Schedule

**DATA COLLECTION**

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Session #  

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<td>PMR only</td>
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<td>PMR &amp;SD</td>
<td>PMR &amp;SD</td>
<td>F/u</td>
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</tbody>
</table>

*collected daily  
**collected for previous semester, current semester, and following semester

TAI = Test Anxiety Inventory; STAI = State and Trait Anxiety Inventory; SUD = Subjective Units of Distress; SUE = Subjective Units of Efficiency; DOC = Degree of Competency, Hours Studied = hours spent studying that day; Hours spent PMR/SD = hours spent practicing Progressive Muscle Relaxation and Systematic Desensitization; GPA = Grade Point Average
Table C.2  
Treatment Timeline

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
<th>Week 6</th>
<th>Week 7</th>
<th>Week 8</th>
<th>Week 9</th>
<th>F/u</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data week 0: Intake, TAI, STAI, data collection</td>
<td>Data week 1: anxiety hierarchy created</td>
<td>Data week 2: PMR begins</td>
<td>Data week 3: PMR continues</td>
<td>Data Week 4: TAI, STAI, SD begins, Mid-terms</td>
<td>Data week 5: SD continues</td>
<td>Data week 6: SD continues</td>
<td>Data week 7: SD continues</td>
<td>Data week 8: TAI, STAI, termination</td>
<td>6-month follow-up, TAI, STAI</td>
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</table>

TREATMENT TIMELINE
Week one: Build rapport, discuss anxiety hierarchy, and treatment goals

Week two: Review anxiety hierarchy- order them appropriately (lowest to highest anxiety), discuss proper, deep diaphragmatic breathing

Week three: Begin progressive muscle relaxation training - practice breathing

Week four: Continue progressive body relaxation

Week five: Finalize anxiety hierarchy and begin desensitization procedure combined with relaxation techniques

Week six: Desensitization procedure and relaxation continues

Week seven: Continue desensitization and relaxation

Week eight: Continue desensitization and relaxation

Week nine: Finalize desensitization and wrap-up, set-up follow-up appointment for four weeks later.
Creating an Anxiety Hierarchy:

List test related situations in reverse order, from least anxiety producing to most anxiety producing. Record at least 8-12 steps in your hierarchy.

1. _____________________________________________
2. _____________________________________________
3. _____________________________________________
4. _____________________________________________
5. _____________________________________________
6. _____________________________________________
7. _____________________________________________
8. _____________________________________________
9. _____________________________________________
10. _____________________________________________
11. _____________________________________________
12. _____________________________________________
13. _____________________________________________
14. _____________________________________________
15. _____________________________________________
16. _____________________________________________
17. _____________________________________________
18. _____________________________________________
19. _____________________________________________
20. _____________________________________________

Laura E. Johnson, MSA, MS, adapted from Bourne, E.J., The Anxiety and Phobia Workbook third edition
Generic Test Anxiety Hierarchy:

1. First day of class
2. Teacher discusses assignments and tests
3. Seeing how many tests there will be
4. Seeing when the first test will be
5. Starting new material
6. Doing homework
7. Learning how many points the upcoming test is worth
8. Seeking help from the teacher/tutor/friend
9. Week before the test
10. Increased studying for the test
11. Test review in class
12. Night before the test
13. Looking over test material – that day
14. Leaving for school the day of the test
15. Walking into the classroom
16. Walking to your seat in classroom
17. Waiting for the test to be passed out
18. Getting the test - starting
19. Coming to a question to which you do not know the answer
20. Finishing the test and having to turn in the test.
Progressive Muscle Relaxation Sequence:

Begin by getting into a comfortable seated position, if your watch or other jewelry is constricting remove them. If you are comfortable closing your eyes, please do so, if not, then find a spot on the floor that you can focus on; this will become your focal spot – make sure it is not a spot that will move – such as someone else’s foot.

It is important to start with some deep breathing. Breathe in through and out of your nose. Make sure you are really filling your lungs – your rib cage and abdominal wall should expand and fill with air. Take at least 5 deep breaths, reminding yourself that with each deep breath you are physically slowing down, your lungs will fill with air that will be transported through your body with each beat of your heart. Your heart will not have to pump as frequently now, as your blood has more oxygen now. Your heart rate will lower, and you will begin to feel yourself relax physically.

Allow any distracting thoughts to simply pass through your mind – like clouds through a sky. Do not fight these distracting thoughts, simply try to ignore them. If ignored, they will pass.

The progressive muscle relaxation will begin with a cycle of tensing and releasing the major muscles. Begin with your hands. Clench your hands into fists – holding the tension there, nice and tight for approximately 10 seconds, then release, feeling the difference between a tensed muscle and a relaxed muscle – staying relaxed for approximately 20 seconds.

Moving up to your biceps, tighten the muscles in the front of your upper arms, by bending the elbow and bringing your fists towards your shoulders. Hold the tension there, nice and tight for approximately 10 seconds, then release by bringing your arms back to a neutral position, feeling the difference between a tensed muscle and a relaxed muscle – staying relaxed for approximately 20 seconds.

Focusing now on the reverse side of your arm, tighten the tricep muscles by extending the arms straight down and locking your elbow. Hold the tension there, nice and tight for approximately 10 seconds, then release by bringing your arms back to a neutral position, feeling the difference between a tensed muscle and a relaxed muscle – staying relaxed for approximately 20 seconds.

Take a nice deep inhale – breathing in relaxation, and on the exhale letting everything else, the stress, the tension, and any fatigue, letting that go. Take one more, nice deep inhale and exhale.

Tense your forehead muscles by wrinkling your forehead – raising your eyebrows. Hold the tension there, nice and tight for approximately 10 seconds, then release, feeling the difference between a tensed muscle and a relaxed muscle – staying relaxed for approximately 20 seconds.
Moving to your eyes – clench your eyes shut and hold the tension there for approximately 10 seconds, then release, feeling the difference between a tensed muscle and a relaxed muscle – staying relaxed for approximately 20 seconds.

Open your mouth as wide as possible and hold open for approximately 10 seconds. Then relax your mouth – allowing the jaw to return to a more natural position. Stay relaxed for approximately 20 seconds.

Take a nice deep inhale – breathing in relaxation, and on the exhale letting everything else, the stress, the tension, and any fatigue, letting that go. Take one more, nice deep inhale and exhale.

Going back to the tensing and releasing of muscles, tense your shoulders by lifting your shoulders to your ears – like when you are saying “I don’t know” nonverbally. Hold the tension there, nice and tight for approximately 10 seconds, then release by bringing your shoulders and arms back to a neutral position, feeling the difference between a tensed muscle and a relaxed muscle – staying relaxed for approximately 20 seconds.

Tense the back of your neck now by tilting your head back as though you were going to look at the ceiling. Hold the tension there, nice and tight for approximately 10 seconds, then release by bringing your head back to a neutral position, feeling the difference between a tensed muscle and a relaxed muscle – staying relaxed for approximately 20 seconds.

Do that same exercise again. The neck is a place where many people hold tension and stress. Visiting this area twice can help get rid of any residual stress and tension.

Take a nice deep inhale twice – breathing in relaxation, and on the exhale letting everything else, the stress, the tension, and any fatigue, letting that go. Take one more, nice deep inhale and exhale.

Moving now to your back, bring your shoulder blades together by bending your arms at the elbows and attempt to touch your elbows together behind your back. Tighten the muscle through your shoulder blade and back area. Hold the tension there, nice and tight for approximately 10 seconds, then release by bringing your body back to a neutral position, feeling the difference between a tensed muscle and a relaxed muscle – staying relaxed for approximately 20 seconds.

Do that same exercise again. The back is another place where many people hold tension and stress. Visiting this area twice can help get rid of any residual stress and tension.

Moving down your back to your lower back, tense the muscles of your lower back by arching the back – this will also stretch the stomach muscles. DO NOT perform this step if you have any lower back pain or problems. Hold the tension there, nice and tight for approximately 10 seconds, then release by bringing your body back to a neutral position,
feeling the difference between a tensed muscle and a relaxed muscle – staying relaxed for approximately 20 seconds.

Sweeping around to the front of the body, tense the muscles in your abdomen by “sucking in your stomach.” Hold the tension there, nice and tight for approximately 10 seconds, then release feeling the difference between a tensed muscle and a relaxed muscle – staying relaxed for approximately 20 seconds.

Take a nice deep inhale – breathing in relaxation, and on the exhale letting everything else, the stress, the tension, and any fatigue, letting that go. Take one more, nice deep inhale and exhale.

Move down now to the gluteus maximus muscle. Tighten the glute muscle, and the hips – which will include tightening the abdomen again. Hold the tension there, nice and tight. After approximately 10 seconds release, and stay relaxed for approximately 20 seconds.

Focus on the foot, tighten the foot by curling the toes under. Hold the tension there, nice and tight. After approximately 10 seconds release, and stay relaxed for approximately 20 seconds.

Now, start at your toes and focus completely on your toes. Be completely aware of your toes, how they feel, the muscles, the bones, the skin, the temperature that they are. Allow your toes to completely relax, as though they could sink into the floor. Working your way from your toes to the bottom of your feet – completely aware of how they feel, the muscles, the bones, the skin. Allow your feet to completely relax, as though they could sink into the floor. Allow that relaxation to wrap around to the top of your feet – again completely aware of how your feet feel – allowing them to completely relax – as though they could sink into the floor.

Let that relaxation travel up through the back of your your lower leg – the calf area, and then the front of your lower leg – the shin area. Allow your toes, your feet, and your lower legs to completely relax. Let that relaxation travel up through the knees and to
your upper leg, through the front of your upper leg, and around to the back of your upper leg. Let that relaxation travel up through your hips, your glutes (butt muscles!), and through your abdomen - completely relaxing your lower body, allowing your lower body to just sink into the chair. Now let that relaxation travel up through the abdomen, around to the lower back, up through the middle back, and around through the rib cage. Take 2 nice deep inhales and let everything go on the exhales, all stress tension, fatigue, and distractions - just let everything go. Now let the relaxation travel up through the chest and around your body to the upper back and up through the shoulders. Let that relaxation cascade down over your arms - your upper arms, your forearms, your hands and your fingers. Now take a nice deep relaxing inhale, and exhale all the distractions and tension. Do that again - nice deep inhale and exhale - really relaxing - from your fingers, your hands, your forearms, upperarms, shoulders and neck. Let your entire body relax - as though it could sink into the chair.

Relax through your neck up to your head - the back of your head, the sides of your head, and now through the front of your face - relax your jaw, relax your mouth, your cheeks, your eyes, your eyebrows, and your forehead - all the way to the top of your head. Now take in a nice deep inhale and exhale, and do that one more time -- breathing in relaxation and exhaling all the left over tension, stress, fatigue, and distractions - letting everything go - and just sinking into the chair.

**When you are ready to bring the client out of this relaxed state:**
begin the deep breathing sequence again - raising your voice a bit with each repetition - have them breath in energy and exhale fatigue, or grogginess. Explain that they are feeling more and more alert - ready to tackle the rest of the day - more and more energized. Have them take in at least 5 inhales - and repeat these instructions to them each time - with a bit louder (and more energized) voice each time.

*Laura E. Johnson, MSA, MS, adapted from Bourne, E.J., The Anxiety and Phobia Workbook third edition*
Systematic Desensitization Sequence:

After the client has entered the relaxed state (see progressive relaxation sequence), you will instruct them to see themselves in their peaceful place, after they have fully experienced their peaceful place they will begin progressing through their anxiety hierarchy. You do not, under any circumstances, want the client to experience anxiety during this process, the goal is for them to be able to progress through the hierarchy without anxiety. If they do begin to experience unease they should return immediately to their peaceful state. You should work out beforehand a simple signal they can give to indicate that they are under stress. I recommend that the subject simply raise a finger on their hand to indicate they need to return to the peaceful place. If they raise their finger, verbally direct them back to their peaceful place. After the client has gone back to the peaceful place and has become relaxed again, try the hierarchy again; picking up on the item last presented. Move back and forth between the hierarchy and the anxiety item as many times as is required until the client can visualize the scene without anxiety. Once the item has been successfully visualized, move onto the next item in the hierarchy. It is recommended that no more than 3-4 items are attempted in a single session, but use the client as a gauge. Some clients can only tolerate 1 or 2 items, especially as the items become more and more anxiety producing.

To begin the visualization/Systematic Desensitization portion instruct the client as follows:

I want you to see yourself completely relaxed, so relaxed that you feel as though you are sinking into the chair. Now I want you to imagine that the chair is a big fluffy cloud and I want you to see yourself sinking into the cloud, completely supported, completely tranquil. Allow yourself to sink into the cloud and then let the cloud slowly drift away. Picture yourself floating along on the cloud, allow your cloud to drift toward the most peaceful, relaxing place you can imagine. It can be a real place or a place that you have created. Really see yourself floating and see the cloud drifting toward this peaceful, relaxing place. Slowly let your cloud descend and place you ever so gently on this very special place. Really look around, really experience this peaceful, tranquil place, use all of your senses. Really see the sights, smell any smells, hear any noises that are present, and feel the air on your skin, what is the temperature, how does this peaceful, tranquil place feel? Really be there and enjoy your special place.

Give the subject a few minutes to experience this special place, commenting every 30 seconds or so "really see yourself there, see yourself relaxing in this peaceful place." After a few minutes have passed you will begin the exposure to the hierarchy.

I want you to really enjoy this peaceful place and know that you can come back here anytime you want to, anytime at all. Now, I want you to imagine yourself _________________ (the first scene in their hierarchy, i.e. "sitting in the classroom on the first day of class."). Really see yourself there. Imagine what it would feel like if you were actually there. (Pause approximately 15 seconds) Now do whatever you need to do to relax in this scene, allow yourself to be completely relaxed in this situation.
(Pause) Now, I want you to see yourself handling this situation EXACTLY the way you want to, see yourself in this situation completely relaxed, completely confident, completely calm, and completely competent. See yourself exactly as you would like to be, calm, confident, relaxed, and competent; really see it. (Pause) Now I want you to let this scene simply fade away and allow yourself to drift back to your peaceful, tranquil place, where nothing can bother you.

Give the subject about one minute to experience this special place, commenting every 30 seconds "really see yourself there, see yourself relaxing in this peaceful place." After a minute has passed you will go to the next step in the hierarchy.

I want you to really enjoy this peaceful place and know that you can come back here anytime you want to, anytime at all. Now, I want you to imagine yourself (the second scene in their hierarchy, i.e. "sitting in the class room while the teacher is discussing upcoming assignments and tests.") Really see yourself there. Imagine what it would feel like if you were actually there. (Pause approximately 15 seconds) Now do whatever you need to do to relax in this scene, allow yourself to be completely relaxed in this situation. Calm, confident, and relaxed. (Pause) Now, I want you to see yourself handling this situation EXACTLY the way you want to. See yourself in this situation completely relaxed, completely confident, completely calm, and completely competent. See yourself exactly as you would like to be, calm, confident, relaxed, and competent; really see it. (Pause) Now I want you to let this scene simply fade away and allow yourself to drift back to your peaceful, tranquil place, where nothing can bother you.

Give the subject about one minute to experience this special place, commenting every 30 seconds "really see yourself there, see yourself relaxing in this peaceful place." After a minute has passed you will go to the next step in the hierarchy.

Continue this sequence until you have gone through each of the steps in the hierarchy. If you end with a step, I recommend that you begin with that step the next time you meet with the subject. In other words, if you progress through items 1-4 during your session, I suggest you begin with item 4, not 5, in your next session with the client. This allows them to always start with a success, and allows the client to ease into the exposure to the hierarchy. If you have any doubt about the clients relaxation during a step of the hierarchy, take them back to the tranquil place and then revisit the previous step. It is fine to repeat steps.

Laura E. Johnson, MSA, MS, adapted from Bourne, E.J., The Anxiety and Phobia Workbook third edition
APPENDIX E:

INSTRUMENTS
Test Anxiety Inventory

Due to Copyright restrictions the TAI actual items cannot be reproduced here. Five Sample TAI items are provided below.

1. I feel self-assured and calm while taking tests .......................... 1 2 3 4
2. Thinking about my grade hinders my work on exams .................. 1 2 3 4
3. During exams I feel very uptight .............................................. 1 2 3 4
4. I feel very jumpy when taking an exam .................................. 1 2 3 4
5. During tests I get so worried that I forget information I really know ...... 1 2 3 4

* 1 = ALMOST NEVER; 2 = SOMETIMES; 3 = OFTEN; 4 = ALMOST ALWAYS
State Trait Anxiety Inventory

Due to Copyright restrictions the STAI actual items cannot be reproduced here. Sample STAI items are provided below.

State Anxiety (how one feels at this very instant):
1. I feel peaceful .................................................. 1 2 3 4
2. I am calm .......................................................... 1 2 3 4
3. I am currently concerned about possible misfortunes ................... 1 2 3 4
4. I feel self-assured .............................................. 1 2 3 4
5. I feel secure ....................................................... 1 2 3 4
* 1 = NOT AT ALL; 2 = SOMEWHAT; 3 = MODERATELY SO; 4 = VERY MUCH SO

Trait Anxiety (how one typically feels):
6. I feel anxious and impatient ..................................... 1 2 3 4
7. I feel contented with myself .................................... 1 2 3 4
8. I feel that problems are piling up so that I cannot conquer them ...... 1 2 3 4
9. I am cheerful ....................................................... 1 2 3 4
10. I feel unworthy .................................................... 1 2 3 4
* 1 = ALMOST NEVER; 2 = SOMETIMES; 3 = OFTEN; 4 = ALMOST ALWAYS
Daily and Weekly Data

Subjective Units of Distress (SUD)

Scale 0-10: O equals no anxiety…. (I will check you for a pulse) 10 equals the intense anxiety, the most anxiety you can imagine …. (I imagine nervous breakdown equivalent) 5 is probably where healthy anxiety becomes distress. I want you to decide what level would interfere with your performance on tests it may be 3 it may be 5, it may be 4.8. That is where we will begin – is your level of unhealthy anxiety.

You will rate your daily studying with SUDs, and your anxiety about upcoming tests with SUDs.

Subjective Units of Efficiency (SUE)

Same concept as the SUD scale 0-10 – 0 is a total waste of time a total waste of time – mind wandering, off-task, can not focus and 10 is the best use of time. You will rate your daily studying with SUEs also.

Degree of competency (DOC)

Again – same scale 0-10. O equals – “I’m gonna fail”, “I’m an idiot” – totally overwhelmed by the material. 10 equals total competency – feeling like an expert – this stuff is second nature. Again – this is how you feel. I am asking you to rate this weekly for each class.

Hours studied

I ask you to report each day how many hours you spend studying each day – for each class. An approximation is fine.

Weekly recap

Here I am asking you to report the tests that you had during the week, and the grade you received – I realize there may be a delay in getting that information.

Hours spent relaxing/desensitizing

This will be zero for the first couple of weeks, then I will want you to practice at home – and record how many hours you spend doing this.
### Monday

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       Studying – hours ____________

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       Studying – hours ____________

Class three: Date of next test ____________ SUD about test _________
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       Studying – SUE ____________
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Friday

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Studying – SUE  ____________
Studying – hours _________

Class two:  Date of next test ____________  SUD about test _________
Studying – SUD  ____________
Studying – SUE  ____________
Studying – hours _________

Class three: Date of next test ____________  SUD about test _________
Studying – SUD  ____________
Studying – SUE  ____________
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Studying – SUE  ____________
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### Sunday

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Weekly recap

Degree of competency (0-100)
Class one
Class two
Class three
Class four

Hours spent doing progressive muscle relaxation
Hours spent doing systematic desensitization
APPENDIX F:

ACRONYMS
ALEC    Adult Learning and Evaluation Center
DOC    Degree of Competence
FSU    Florida State University
LD     Learning Disability/Learning Disabled
Non-LD Non-Learning Disabled
PMR    Progressive Muscle Relaxation
SD     Systematic Desensitization
SUD    Subjective Units of Distress
SUE    Subjective Units of Efficiency
STAI   State Trait Anxiety Inventory
TA     Test Anxiety
TAI    Test Anxiety Inventory
TAI/E  Test Anxiety Inventory/Emotionality
TAI/W  Test Anxiety Inventory/Worry
Table G.1
Individual Case Study Characteristics

<table>
<thead>
<tr>
<th>Individual Case Study Characteristics</th>
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<tbody>
<tr>
<td>Gender</td>
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<tr>
<td>Major</td>
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<tr>
<td>Year in school</td>
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<tr>
<td>Ethnicity</td>
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<tr>
<td>LD/non-LD (Status)</td>
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<tr>
<td>Number of classes taken that semester</td>
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<tr>
<td>Duration of your Test Anxiety (self-report)</td>
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<tr>
<td>Do you experience academic anxiety only?</td>
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<td>Other anxiety reported (if applicable)</td>
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<tr>
<td>GPA semester before treatment</td>
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<td>GPA semester of treatment</td>
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<td>GPA semester after treatment</td>
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<tr>
<td>Initial Overall Test Anxiety Inventory Percentile</td>
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<td>Initial Test Anxiety Inventory -Worry Perentile (Cognitive)</td>
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<tr>
<td>Initial Test Anxiety Inventory - Emotionality Percentile (Physiological)</td>
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<td>Midpoint Overall Test Anxiety Inventory Percentile</td>
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<td>Midpoint Test Anxiety Inventory - Worry Percentile (Cognitive)</td>
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<td>Midpoint Test Anxiety Inventory - Emotionality Percentile (Physiological)</td>
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<td>End Overall Test Anxiety Inventory Percentile</td>
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<td>End Test Anxiety Inventory -Worry Percentile (Cognitive)</td>
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<tr>
<td><strong>End Test Anxiety Inventory -Emotionality Percentile (Physiological)</strong></td>
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<td><strong>Follow-up Overall Test Anxiety Inventory Percentile</strong></td>
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<td><strong>Follow-up Test Anxiety Inventory -Worry Percentile (Cognitive)</strong></td>
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<td><strong>Follow-up Test Anxiety Inventory -Emotionality Percentile (Physiological)</strong></td>
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<td><strong>Initial Trait Anxiety score Percentile</strong></td>
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<td><strong>Initial State Anxiety score Percentile</strong></td>
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<td><strong>Mid-point Trait score Percentile</strong></td>
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<td><strong>End State Anxiety score Percentile</strong></td>
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<td><strong>F/U State Anxiety score Percentile</strong></td>
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<td><strong>Mean SUD Weeks one through eight</strong></td>
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<td><strong>Mean SUE weeks one through eight</strong></td>
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<td><strong>Mean DOC weeks one through eight</strong></td>
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<td><strong>Mean Hours Studied weeks one through eight</strong></td>
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Stober & Esser (2001) Test Anxiety and Metamemory: General preference for external over internal information storage. Personality and Individual Differences 30 (5) 775-781


EDUCATION AND TRAINING

Ph.D., Florida State University, Counseling Psychology and School Psychology 2007
Certification, Play Therapy, National Institute of Relationship Enhancement 2001
M.S., Counseling, GPA: 3.97, SUNY Oswego, Oswego, NY 2000
M.S.A., Administration, GPA: 3.7, Central Michigan University, Mount Pleasant, MI 1997
Thesis: Need for an All-Inclusive Fitness Facility in Leavenworth Kansas
B.A., Sociology, Stetson University, Deland, FL 1988
Senior Thesis: “Semper Fi” and Other Socialization Tricks
Executive Staff Manager’s Course, FT Leavenworth, KS 1994
Military Police Officer’s Advanced Course, FT McClellan, AL 1992
Military Police Officer’s Basic Course, FT McClellan, AL 1988

SUMMARY OF QUALIFICATIONS

• More than 17 years professional experience in instructing, counseling, leadership, and guidance in both the United States Army and private organizations with proven expertise in individual counseling.
• Experienced with the DSM IV, multiaxial diagnoses, Mental Status Evaluations, interviews and treatment plans, and psycho-educational evaluations; including most tests of cognitive abilities and achievement.
• Dynamic, enthusiastic, and energetic communicator who easily builds rapport and motivates others.
• Natural public speaker and instructor.
• Versed in several counseling theories with an emphasis on client-centered and cognitive-behavioral counseling.
• Specialty coursework in assessment, consultation, and play therapy.
• Experienced with most mental health populations; with expertise in children’s and adolescent’s issues.
• Proficient with computer applications including, Microsoft Word, PowerPoint, and the Internet.
• Excellent sense of humor and life balance.

PROFESSIONAL EXPERIENCE

Doctoral Psychology Intern, Florida State University, Multidisciplinary Evaluation and Consulting Center, FSU, Tallahassee, FL 2006-2007

• Performed a 2000 Hour Doctoral level internship.
• Conducted Psychoeducational testing of school age children for Specific Learning Disabilities, Mental Retardation, Emotional Handicaps, and Giftedness.
• Evaluated school age children for ADHD. Evaluations included parent intake interviews, child observations at school, and child assessments.
• Researched Autism and ADHD
• Performed Autism evaluations using the Autism Diagnostic Observation Schedule. Provided Multiaxial diagnoses.
• Supervised Master’s level school psychology practicum students.
• Consulted with teachers and parents for children who displayed academic and behavioral issues, but who were not eligible to receive Exceptional Student Education Services.
• Provided individual counseling to at-risk students.
• Co-facilitated three counseling groups for at risk students.
• Attended weekly in-service trainings
• Developed and presented an empirically supported treatment plan for test anxiety.
• Attended parent and school level IEP meetings providing the interpretation of the results of the psychological testing.
• Attended Child Study Team meetings providing valuable input to the research based interventions to be implemented and consulted with the teachers and staff on the best way to help the students presented at these meetings.

Adjunct Instructor, Department of Social and Behavioral Sciences, Midlands Technical College, Columbia, SC 2004-2006
• Lectured on various topics in General Psychology, including research methods, the history of modern psychology, biological basis of behavior, learning, memory, human development, personality, psychopathology and treatment interventions, and intelligence testing.
• Instructed students from diverse multicultural backgrounds, including some limited English speaking students.
• Developed a course syllabus, lesson plans, and power point instructional slides for the course.
• Supervised students’ research projects and presentations, and instructed students on how to prepare an appropriate research paper.
• Assisted Individual Students as required

Teaching Assistant, School Consultation, Department of Educational Psychology and Learning Systems, FSU, Tallahassee, FL 2004
• Instructed students in the Problem Identification Interview, the Problem Analysis Interview, the Problem Evaluation Interview, and Interventions for behavioral and academic difficulties.
• Supervised 10 students in the consultation experience, provided assistance as needed in intervention selection and interactions with school personnel.
• Assisted individual students with specific questions and problems on an as needed basis.
• Coordinated with the instructor in assessing student’s consultation efforts and performance.

Teaching Assistant, Assessment of Intelligence, Department of Educational Psychology and Learning Systems, FSU, Tallahassee, FL 2003
• Co-created a syllabus and lesson plans for the hands-on lab portion of the course.
• Supervised the students’ administration of practice tests, reviewed videotaped performances for proper technique, adherence to standardization, rapport building, and facility with the subtests.
• Assisted individual students with specific questions and problems on an as needed basis.
• Coordinated with the instructor in assessing student’s consultation efforts and performance.

Research Assistant and Practicum Student, Department of Educational Psychology and Learning Systems, FSU, Tallahassee, FL 2002 - 2004
• Created and implemented an empirically supported test anxiety treatment protocol for individual clients and groups.
• Provided treatment for nine individual test anxious clients through the Florida State University, Adult Learning and Evaluation Center.
• Co-authored an article addressing the perceptions students with learning disabilities have regarding the recommendations they are given.
• Co-lead the research team that compiled the literature review and collected the data for a research article.
• Provided coaching for three Attention Deficit Hyperactive Disorder adults through the Florida State University, Adult Learning and Evaluation Center.
• Developed treatment goals with the clients; assisted in the setting and attaining of therapeutically appropriate and sound goals.
• Collected data on treatment progress for both test anxious and ADHD coaching clients.
• Co-facilitated an eight-week study skills workshop for college and high school students.
• Engaged in self-study and clinical supervision to enhance my understanding of ADHD, Test Anxiety, and Learning Disabilities in the college population.
• Reviewed professional journal research articles addressing learning disabilities, test anxiety, and disability accommodations to collect research and empirical support for potential programs and interventions to be designed and implemented by the Adult Learning and Evaluation Center.
• Attended weekly research meetings: presented research findings and updates on treatment program design and client progress.
• Assessed adult/adolescent and children clients for learning disabilities, administered tests of cognitive ability and achievement tests, scored and interpreted results, wrote psychological reports, and provided feedback to the clients.

Clinical Therapist, Veteran’s Affairs Clinic, Genesis Health Care, Watertown, NY 2001 – 2002
• Transferred, within the organization, to work with the veteran population, based on clinical proficiency, knowledge, and professional flexibility.
• Provided individual therapy to military veterans of all ages with a diverse collection of mental health issues.
• Encouraged healing and self-growth using a plethora of therapeutic techniques, both alternative and traditional; including visualization, positive affirmations, yoga and meditation, movement and exercise, deep breathing, journaling, letter writing, bibliotherapy, and role-play.
• Developed an experiential stress reduction group that incorporated art therapy, music therapy, relaxation, psychodrama and self-esteem building.
• Developed treatment plans with the patients and conducted treatment plan reviews to assist in setting and attaining therapeutically sound goals.
• Coordinated with the staff psychiatrist to monitor patients on medication and to facilitate treatment.
• Coordinated emergency services and hospitalizations with high-risk clients on an as-needed basis.
• Worked with both the patients and collateral parties to encourage a healthy family system.
• Conducted assessments, diagnosed patients and made referrals to the psychiatrist, if required, on all new patients.
• Engaged in self-study and clinical supervision to enhance my understanding of PTSD, addiction and the comorbidity of these two issues.

Clinical Therapist, Genesis Health Care, Watertown, NY 2000 – 2001
• Provided individual therapy and supportive counseling to multicultural clientele.
• Conducted intake assessments, administered mental status exams and diagnosed clients as appropriate.
• Worked with clients to create specific, realistic, timely and measurable goals and treatment plans.
• Effectively employed various treatment techniques such as play therapy, art therapy, music therapy, asset inventory, affirmations, cognitive-behavioral therapy, reality therapy and behavior modification to assist clients in their personal growth.
• Facilitated weekly adult stress-reduction group.
• Instructed yoga and meditation group for the mentally ill and chemically abusive population and the clients in continuing day treatment.
• Co-facilitated a “Girl Power” group focusing on self-esteem, self-awareness, relationship building and social skills for adolescent girls.
• Facilitated a social skills group for children ages 6-8, and 9-11 concentrating on self-esteem, conflict resolution, friendship building, and delayed gratification.
• Independently sought out and attained post-graduate certification in play therapy.

Vocational Counselor, Army Career and Alumni Center, FT Drum, NY 1999 – 2000
• Provided individual and vocational counseling to approximately 45 clients each month.
• Assisted clients in successfully adapting to one of the more significant transitions of their lives, leaving military service for either voluntary, involuntary, or medical reasons.
• Quickly built rapport, gained an understanding of the client’s phenomenological world, assisted in problem solving and realistic goal setting.
• Helped promote growth and change, maximizing the client’s potential through careful assessment and acknowledgement of their personal skills and strengths.
• Conducted bimonthly psycho-educational courses, to approximately 30 clients, covering transitional issues, career planning, personal skill identification, resume writing, computer skills, Internet operations, networking, and interviewing – repeatedly receiving top marks on client critiques.

Concurrent with graduate education and employment: Instructor/Trainer 1997 – 2004
• Instructed meditation and guided imagery techniques during weekly yoga classes.
• Motivated groups and individuals to perform beyond their personal expectations.
• Instructed up to 5 group fitness classes per week to an audience of approximately 25 students.
• Provided personal training and counseling to approximately 15 clients per week.
• Certified Yoga instructor, aerobics instructor, and personal trainer.

Military Police Officer (Major), Active Duty, United States Army 1988 – 1997
Positions Held:
Company Commander, FT Leavenworth, KS 1994 – 1997
Chief of Casualty and Mortuary Affairs, FT Myer, VA 1993
Company Commander, FT Belvoir, VA 1992 – 1993
Logistics Officer, Seoul Korea 1990 – 1991
Executive Officer/Platoon Leader, FT Knox, KY 1988 – 1990
• Closely counseled and guided staff employees in a high-risk environment fraught with the unique stress-related and high anxiety employment aspects of a prison.
• As the director of casualty and mortuary affairs, counseled and worked with the surviving family members of deceased military officers. Provided direct family counseling including bereavement support, stress reduction and agency referrals.
• Provided job related, educational and personal counseling to 150 employees, empowering them to make the best decisions for themselves.
• Planned and conducted special management programs focused on positive motivation and leadership.
• Managed a diverse group of employees with different cultural backgrounds and experience levels.

VOLUNTEER EXPERIENCE
• Co-facilitated a “Girls on the Run” program; teaching values and character development to girls in grades 3-5, while promoting physical fitness and self-esteem.
• Assisted the Kindergarten teacher at Betton Hills Preparatory School with her kindergarten reading program; allowed children to read to books to me and helped them identify and learn words and word sounds with which they were unfamiliar.
• Acted as a liaison between parents, teachers, and children at the Fort Drum, NY child development center. Assisted in educating parents in ways to improve their child's school experience. Additionally, attended parent advisory board meetings, providing input to benefit all concerned parties.
• Volunteered at the Sullivan House, a temporary homeless shelter in Arlington, VA. Helped residents prepare their income taxes, provided physical fitness training, computer skills training, and supervised field trips for the children.
• Provided motivational training for at-risk adolescent girls, focused on self-esteem building.
• Worked with family support groups to provide a liaison between service members and their families – educating both groups on their roles and responsibilities.
• While deployed to Honduras, “adopted” a Honduran grade school. Managed the painting, clean up, and renovations. Additionally supervised donations of clothes, books, toys and sundry items.

PRESENTATIONS
Co-presenter, Stress Reduction through Alternative Methods, Genesis Health Care, 2000, Watertown, NY
Guest Lecturer, Stress Reduction, Florida State University, October 2002, Tallahassee, FL
Presenter, Test Anxiety Reduction, FASP conference November 2003, Tampa, FL
Guest Lecturer, Overview of Play Therapy and Play Therapy techniques in psycho-educational assessment, Florida State University, April 2004, Tallahassee, FL
School Psychology Practicum Guest Lecturer, Overview of Play Therapy and Play Therapy techniques in psycho-educational assessment, Florida A&M University, May 2004, Tallahassee, FL
Presenter, Test Anxiety Reduction, AHEAD conference July 2004, Miami, FL
Presenter, Perceived usefulness of recommendations given to college students evaluated for learning disability, AHEAD conference July 2004, Miami, FL
Presenter, Test Anxiety Reduction, SCASP conference November 2004, Columbia, SC
Presenter, Reducing Test Anxiety and Improving Test Taking Skills, Midland’s Technical College, October, 2005
Guest Lecturer, Careers in Psychology, Florida State University, November 2006, Tallahassee, FL

PROFESSIONAL AFFILIATIONS AND HONORS
Recipient, Thomas Chapman Award, Wellness Model in Counseling, SUNY Oswego  2000
Phi Lambda Theta Honors Fraternity  2002 - Present
Florida Association of School Psychologists
International Association of Play Therapy

PUBLICATIONS