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A School-Based Intervention for Third Grade Students Experiencing Test Anxiety

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ACCEPTANCE

This dissertation, A SCHOOL-BASED INTERVENTION FOR THIRD GRADE STUDENTS EXPERIENCING TEST ANXIETY, by LAURA S. TENENBAUM, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the College of Education, Georgia State University.

The Dissertation Advisory Committee and the student's Department Chair, as representatives of the faculty, certify that this dissertation has met all standards of excellence and scholarship as determined by the faculty. The Dean of the College of Education concurs.

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ABSTRACT

A SCHOOL-BASED INTERVENTION FOR THIRD GRADE STUDENTS EXPERIENCING TEST ANXIETY
by
Laura S. Tenenbaum

With the advent of the No Child Left Behind Act (NCLB, 2001), students are regularly faced with high stakes tests and classroom-based assessments to determine if they are meeting grade level educational standards. Estimates suggest that up to 40% of children may experience significant anxiety surrounding evaluations (e.g., McDonald, 2001; Turner, Beidel, Hughes, & Turner, 1993) and research shows that this test anxiety can negatively impact school performance (e.g., Abu-Rabia, 2004; Putwain, 2008) and mental health (e.g., Barksdale-Ladd & Thomas, Weems et al., 2010). As a result, test anxiety has become a topic of concern for researchers, educators, and mental health practitioners. The construct of test anxiety can be defined as the experience of marked psychological distress when faced with evaluative situations (McDonald, 2001). While researchers have discussed effective methods used to reduce test anxiety symptoms, much of this literature has focused on intervention within clinic settings rather than within the school environment (Gregor, 2005). Research in this area also tends to concentrate on older children and adults instead of elementary-aged students (Gregor, 2005; Weems et al., 2010). To address these gaps within the intervention literature, the purpose of the current pilot study was to develop, implement, and evaluate a school-based small group intervention designed to reduce test anxiety and increase coping skills in third grade students. The intervention was hypothesized to increase students' awareness and use of stress management strategies, improve cognitive flexibility and inhibition of automatic anxious thoughts, decrease symptoms of anxiety, and increase

confidence in their ability to face evaluative situations. Results of paired-sample *t* tests indicated that students reported significantly increased knowledge of test anxiety reduction strategies and a greater willingness to implement these strategies. Trend level gains in cognitive flexibility were discovered, though results were not statistically significant. Despite growth in student knowledge and cognitive flexibility, anxiety was not significantly reduced. Quantitative and qualitative findings suggested that the intervention was implemented with integrity and was acceptable to participants and facilitators. Results are discussed and implications for future directions in research and practice are suggested.

A SCHOOL-BASED INTERVENTION FOR THIRD GRADE STUDENTS EXPERIENCING TEST ANXIETY

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ABBREVIATIONS

AYP	Adequate Yearly Progress
CBT	Cognitive Behavioral Therapy
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision
NCLB	No Child Left Behind Act
RTI	Response to Intervention
SQ3R	Survey, Question, Read, Recite, Review

CHAPTER 1

TEST ANXIETY IN ELEMENTARY SCHOOL CHILDREN: PREVENTION AND INTERVENTION STRATEGIES FOR TEACHERS

In virtually all elementary schools within the U.S. today, children are expected to meet educational standards to determine if they are adequately learning grade level material. Student achievement in the classroom can be measured in a variety of ways, including in-class activities, homework assignments, and classroom tests. Student knowledge is often evaluated through state and national standardized assessments designed to measure individual student achievement to meet the requirements of the federal No Child Left Behind Act (NCLB, 2001; Roach & Frank, 2007). The NCLB Act (2001) mandated the use of regular standardized assessment in U.S. public schools to measure student achievement, increase accountability of schools and teachers, and aid in educational research (Roach & Frank, 2007; Vannest, Mahadevan, Mason, & Temple-Harvey, 2009). While the effectiveness of NCLB and the resulting regimen of standardized high stakes testing in public schools remains in question (e.g., Barksdale-Ladd & Thomas, 2000; Kohn, 2000; Maleyko & Gawlic, 2011; Mason, 2007; Nichols, 2007), evaluation of elementary-aged children using both high stakes standardized assessment and in-class curriculum-based measures likely will remain an integral part of the American school culture. Regarding testing, schools and teachers generally focus their resources on teaching students the essential academic content that they are expected to know in order to meet educational standards. While this is a crucial component of educating children, it also is important to address the psychological impact of school-based evaluations and how individuals within the schools, particularly teachers, can

address this factor. Elementary school students in the U.S. spend approximately 33 hours a week at school with one primary teacher (Hofferth & Sandberg, 2001) and as a result, teachers play an essential role in preventing, identifying, and intervening with student anxiety (Casbarro, 2005).

The experience of test taking and other performance based evaluations may cause significant anxiety for some children (Kruger, Wandle, & Struzziero, 2007; McDonald, 2001; Putwain, 2009a; Strumpf & Fodor, 1993). Anxiety surrounding evaluative situations is known as *test anxiety*. Test anxiety can be triggered by situations like classroom-based and high-stakes testing, school presentations, classroom discussions, school plays and performances, and sporting events, to name a few. Test anxiety involves significant emotional, physiological, and cognitive reactions to evaluative situations that can negatively impact both students' psychological well-being and their school performance (e.g., Abu-Rabia, 2004; Fengquiang, Peng, Yu, & Shihai, 2006; Putwain & Daniels, 2010; Putwain, Connors, & Symes, 2010; Sena, Lowe, & Lee, 2007; Weems et al., 2010). Numerous studies have suggested that students who experienced test anxiety performed more poorly on examinations than their less anxious peers (e.g., Abu-Rabia, 2004; Putwain, 2008; Putwain, 2010). Because testing is so pervasive within the U.S. school system and is frequently used as a primary method to evaluate student achievement, it follows that managing student test anxiety is a critical component of their academic success.

As teachers serve as both educators and mentors to their students, teachers are in a role to affect positive change. While the body of research on test anxiety has discussed effective methods that can be used to reduce test anxiety, much of the literature has

focused on interventions within clinic based settings, rather than within the school environment (Gregor, 2005; Weems et al., 2010). Furthermore, research on test anxiety interventions frequently has concentrated on older children and adults, instead of elementary-aged students (Gregor, 2005; Weems et al., 2010). Lastly, information is limited when it comes to examining methods that elementary school teachers can use with their students in the classroom.

The purpose of this article is to discuss the phenomenon of test anxiety as it applies to elementary school children and identify strategies that teachers can use in the classroom to address test anxiety. Theories of test anxiety will be reviewed and test anxiety will be examined within the current school climate. Academic and psychological outcomes associated with test anxiety for elementary-aged children will be discussed. The remainder of the article will review research-based strategies to address test anxiety and will explain how these strategies can be used by teachers within the classroom environment.

Test Anxiety: What Teachers Should Know

Definition and Theories

The construct of test anxiety can be defined as the experience of marked psychological distress when faced with evaluative situations (McDonald, 2001). This form of anxiety may stem from an 'ego threat' that includes fear of judgment surrounding poor performance and the subsequent threat to self-esteem (Spielberger, 1966). While the term "test anxiety" is the most common name assigned to the phenomenon, other labels may include performance anxiety, examination anxiety, mathematics anxiety, sports anxiety, or fear of failure (Stober & Pekrun, 2004). Test anxiety most closely aligns with

the psychological diagnosis of social phobia within the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) (American Psychiatric Association, 2000), which involves fear of entering into social situations due to concern about poor performance and embarrassment (McDonald, 2001). It can be understood as a type of *state anxiety* as opposed to a *trait anxiety,* in that individuals with test anxiety experience significant stress only under specific states or situations (e.g., when taking a test, giving a class presentation, answering questions in front of others) (Abu-Rabia, 2004). Those who experience trait anxiety feel distress in a more generalized sense and may feel anxious most of the time during their day, rather than during particular types of situations.

There are four primary theories of test anxiety that have provided the greatest contribution to the literature. The first theory, the two factor model, states that test anxiety involves two components, (1) worry, and (2) emotionality (Liebert & Morris, 1967; McDonald, 2001). Worry refers to the distressing and preoccupying thought processes that accompany the experience of test anxiety (McDonald, 2001; Sarason, 1988). For example, cognitions may involve anticipatory thoughts about an upcoming test (e.g., "This is going to be so hard!"), about the judgments of others (e.g., "If I mess up on this presentation, everyone is going to think I'm stupid."), or negative consequences (e.g., "If I miss this goal, the coach will put me on the bench next game."). In addition to anticipatory anxious thoughts, students experience automatic cognitions during testing experiences that may be negative or unrealistic in nature (e.g., "I don't know the answer to this question. I'm going to fail this whole test!"), and can serve to increase and perpetuate test anxiety (Russo, 1984). Emotionality refers to the

physiological component of test anxiety (McDonald, 2001; Sarason, 1988), that is, the way that the body reacts, which may include gastrointestinal upset, increased heart rate and blood pressure, body temperature changes, or tremors (Casbarro, 2005).

A second theory suggests that test anxiety includes four components: (1) worry, (2) emotionality, (3) interference, and (4) lack of confidence (Hodapp, 1991; Stober, 2004). Interference refers to "distracting and blocking" (Stober, 2004, p. 215) thoughts that can significantly interfere with an individual's performance during an evaluative situation (Hodapp, 1991; Stober, 2004). Therefore, in addition to worrisome thoughts about potential outcomes of an evaluative situation that cause psychological distress, the interference component suggests that certain cognitions can be so overwhelming that they monopolize a person's cognitive resources, thus preventing the individual from being able to fully utilize their cognitive processes for the task at hand and causing them to perform poorly (Stober, 2004). The final component, lack of confidence, indicates that children's perception about their own abilities is a key element in understanding and the construct of test anxiety and helping those who experience it (Putwain, 2009b; Stober, 2004). Research in support of the four factor model has suggested that both interference and lack of confidence are relevant to understanding test anxiety (e.g., Putwain, 2009b; Putwain, et al., 2010). Putwain et al., (2010) found that interfering cognitions (e.g., overgeneralizing, catastrophizing) were correlated with the components of emotionality and worry in children with test anxiety. Additionally, Putwain's (2009b) research supported the link between academic self-concept and test anxiety by revealing that children reported increased test anxiety during situations in which they felt less confidence about their own abilities.

The final theories of test anxiety (the skills deficit model and the integrated model) that will be reviewed within this article examine how knowledge and skill play a role in the experience of test anxiety. The skills deficit model suggests that students who experience test anxiety do so because they have learning difficulties and are unable to adequately learn and integrate content material (Birenbaum, 2007; Culler & Holahan, 1980; Tryon, 1980). According to this model, individuals perform poorly not due to test anxiety, but due to their lack of skill and understanding of classroom material (Birenbaum, 2007; Culler & Holahan, 1980; Naveh-Benjamin et al., 1987; Tryon, 1980). McKeachie, & Lin (1987) suggested an integrated model of test anxiety that incorporates cognitive components while including the understanding that skills deficits may play an important role in the development of test anxiety. This model proposes two types of test anxious students: those with appropriate learning strategies who are unable to retrieve content information during examinations and those with poor learning strategies who do not learn the information during the training process (Naveh-Benjamin et al., 1987). According to this theory, both of these students perform poorly on tests and experience test anxiety, but for different reasons.

Overall, these theories suggest that test anxiety is a complex phenomenon involving several different elements: worry, emotionality, interference, lack of self-confidence, and skills deficits. Furthermore, test anxiety may involve distinct components for each individual. In order to adequately address test anxiety in elementary school children, it will be essential to consider each contributing element when implementing interventions. This article is designed to serve as a guide for teachers to help prevent, identify, and intervene with children experiencing test anxiety by providing different data

driven classroom-based strategies that can be used to address each contributing component of test anxiety.

Test Anxiety in Today's Schools

As an integral part of the elementary school experience, teachers must monitor student learning to determine if they are understanding concepts, making age appropriate progress, and identify areas of strength and weakness to aid in future educational planning. However, in the current school climate, much of the process of assessing student learning has been taken out of teachers' hands (Barksdale-Ladd & Thomas, 2004; Jones, 2007). With the advent of NCLB (2001), federal mandate requires that standardized assessments be administered to determine student progress and increase the accountability of schools and teachers with regard to student learning (Vannest et al., 2009). So, while teachers still must monitor their student progress as part of their classroom practices, students must also be prepared to be assessed using standardized measures multiple times a year. This can amount to quite a lot of testing! In addition to the sheer volume of assessment within the current school climate, many of these evaluations are "high stakes" in that results can have serious consequences for students, schools, and teachers (Kruger, et al., 2007; Jones, 2007). For examples, test results are used to determine if schools are making adequate yearly progress (AYP) which can impact school funding, staff retention, and school restructuring. Additionally, results on high stakes evaluations may impact student grade promotion and retention (Hembree, 1988; Jones, 2007; Kohn, 2000). Research has demonstrated that evaluative situations in schools like high stakes testing, presentations, or performances may cause significant test

anxiety for some students (Kruger et al., 2007; McDonald, 2001; Putwain, 2009a; Strumpf & Fodor, 1993).

While research on prevalence of test anxiety is limited due to the lack of test anxiety measures with adequate norms (McDonald, 2001), available studies suggested that test anxiety may impact up to 40% of children (McDonald, 2001; Nottelman & Hill, 1977; Turner, Beidel, Hughes, & Turner, 1993). McDonald (2001) indicated that these estimates may be under representing the full scale of the problem because children with test anxiety may either choose to leave school due to fear of evaluation or may not advance academically as a result of poor performance. Additionally, anxiety related problems like test anxiety may be overlooked because symptoms are often internalized and can be difficult to identify (Fox, Halpern, & Forsyth, 2008; Strumpf & Fodor, 1993).

Research has suggested that test anxiety disproportionally impacts certain populations, including children with a low socioeconomic status (Guida & Ludlow, 1989), minority students (Bryan, Sonnenfeld, & Grabowski, 1983; Hembree, 1988; Turner et al., 1993), English language learners (Hodge, McCormick, & Elliot, 1997), and children with learning disabilities (Sena et al., 2007). All of these students tend to perform more poorly on standardized tests (Berliner, 2006; Horn, 2003; National Center for Educational Statistics, 2004), and often undergo more testing than other children, which are likely a contributing factors to their increased experiences of test anxiety (Elliot, 2007; Jones, 2007). Additionally, many states require the passage of standardized assessments for graduation and grade promotion (Jones, 2007), and research has found that grade retention is rated as one of the most stressful life events for a child (Kruger et al., 2007). All of these factors contribute to the increased rate of test anxiety experienced

in these unique populations. Gender has also been identified as a factor influencing the prevalence of test anxiety, with girls reportedly experiencing test anxiety with more frequency than boys (Abu-Rabia, 2004; Chapel et al., 2005; Guida & Ludlow, 1989; Hembree, 1988; Locker & Cropley, 2004; Sena et al., 2007), consistent with the gender differences present in research on anxiety in general (e.g., Costello et al., 2003).

The Impact of Test Anxiety on Elementary School Children

Research has suggested that the experience of test anxiety is associated with negative academic and mental health outcomes for students (e.g., Abu-Rabia, 2004; Fengquiang, Peng, Yu, & Shihai, 2006; Putwain & Daniels, 2010; Weems et al., 2010). Studies on academic outcomes of test anxiety have overwhelmingly found that children with test anxiety perform worse on examinations than their non test-anxious counterparts (e.g., Abu-Rabia, 2004; Meisner & Macki, 2007; Nottelman & Hill, 1977; Putwain, 2008; Stevenson & Odom, 1965). Additionally, it has been found that test anxiety negatively impacts performance during many types of evaluative situations (e.g., testing, presentations, performances), but even more so when the external evaluative pressure is high (i.e., others will know your performance, your results have implications for your future) (Cassady, 2004a; Hancock, 2001).

Research has demonstrated that test anxiety may impact performance in a number of different ways. Cognitive interference involving distracting and preoccupying thoughts that may be irrational or overly pessimistic (e.g., “I failed the last test, so I’m definitely going to fail this one) can impact an individual’s ability to adequately focus on a task such as a test and thus cause them to perform more poorly (Putwain et al., 2010; Sena et al., 2007). Nottelman & Hill (1977) found that children with test anxiety exhibited

significantly more off-task behaviors during evaluative situations than their non-anxious counterparts and Swanson & Howell (1996) confirmed that test anxiety impacts concentration. Test anxiety has been found to reduce working memory capacity (Hadwin, Brogan, & Stevenson, 2005; Lee, 1999), slow processing speed (Hadwin et al., 2005), and impact reading comprehension (Cassady, 2004a) as well. Additionally, research has revealed that test anxiety impacts the learning process, with test anxious students experiencing more difficulty encoding, organizing and storing information in their memory for later retrieval (Cassady, 2004a).

Barksdale-Ladd & Thomas' (2000) research on teacher perceptions of high stakes testing suggested that the negative impact of test anxiety on children is observable in the classroom. One teacher stated:

> They [students] hate the assessments. Their best writing . . . has not been with those assessments. They always do so well with in-class stories; that's when I know what their best writing skills are like. More often than not, I'm disappointed with the assessments (Barksdale-Ladd & Thomas, 2000, p. 391).

Given the research on academic outcomes with regard to test anxious students (e.g., Putwain et al., 2010; Sena et al., 2007), it is clear that these children have difficulty achieving their academic potential. McDonald (2001) hypothesized that students who perform poorly on exams due to test anxiety may be removed from the system due to their failure to advance academically and research has revealed that children with test anxiety have higher rates of grade retention (Hembree, 1988) and school dropout than non-anxious students (Jones, 2007; Spielberger, 1966).

Research has demonstrated that students have experienced significant psychological distress due to test anxiety (e.g., Weems et al., 2010). Clinical symptoms of anxiety disorders and depression have been found to be associated with test anxiety

(Weems et al., 2010), with one study suggesting that up to 60% of test anxious elementary school students met the diagnostic criteria for an anxiety disorder (Beidel & Turner, 1988). Children with test anxiety have experienced psychological symptoms including increased feelings of worry, nervousness, and emotionality (Barksdale-Ladd & Thomas, 2000; Sena, et al., 2007), reduced self-esteem, and weak academic self-concept (Miesner & Maki, 2007; Putwain & Daniels, 2010; Wong, 2008). Children with learning disabilities are particularly affected, experiencing test anxiety at a greater rate than their nondisabled counterparts (Peleg, 2009; Sena et al., 2007), while demonstrating significantly reduced self-confidence and feelings of academic competence (Peleg, 2009). In Barksdale-Ladd & Thomas' (2000) study on teacher perceptions of high stakes testing, teachers confirmed that self-confidence is impacted by test anxiety:

> The pressure is on the kids. I had a learning disabled child who took [the state writing test] last year and got a 2.5. This child was hysterical when she found out. She didn't come back to school the next day. It knocked all of the self-confidence we'd built up right out of her (p. 391).

Choi (1998) found that children who felt less in control of their schooling experiences (external locus of control) were more likely to have test anxiety than children who felt more in control (internal locus of control). Researchers have found that children who felt less competent, with low perceptions of their academic abilities, were more likely to suffer from test anxiety and demonstrated reduced performance on exams (Putwain, 2009a; Putwain & Daniel, 2009). Low self-efficacy (Ferraro, 2005) was also found to be associated with increased test anxiety, particularly with regard to symptoms of cognitive interference, and decreased test performance. Considering that children with test anxiety experienced poor performance, symptoms of anxiety and depression, and reduced self-esteem, academic self-confidence, and sense of control, it is no surprise that

children with test anxiety demonstrated a reduced motivation to achieve, reporting a lesser relationship between their individual efforts and their ultimate performance, particularly in highly evaluative schools and classrooms (Hancock, 2001). The cycle of test anxiety, reduced self-confidence, and poor performance likely serves to perpetuate test anxiety if no intervention is implemented (Russo 1984).

While the majority of research on childhood test anxiety tends to focus on middle and high school students (Gregor, 2005), elementary children are at a unique stage developmentally (Flavell, Miller, & Miller, 2002; Piaget, 1970), which may warrant increased attention to their experiences with test anxiety. Elementary-aged children have left a phase of cognitive development that involves magical and egocentric thinking and have entered into a stage of concrete and logical thought (Flavell et al, 2002; Piaget, 1970). This cognitive growth increases students' awareness of their own strengths and weaknesses and how these personal attributes may impact their academic success or failure (Eshel & Klein, 1981; Guay, Marsh, & Boivin, 2003; Wingfield & Karpathian, 1991) as they establish their academic self-concepts (Eshel & Klein, 1981; Guay et al., 2003). As children are developing this greater understanding of their own abilities in relation to others (Flavell et al., 2002; Guay et al., 2003; Wingfield & Karpathian, 1991), they are also experiencing increased academic evaluation, as the elementary years are typically the starting point for high stakes testing. Unsurprisingly, research has indicated that test anxiety begins to occur during these formative years (Hembree, 1988; Kruger et al., 2007). Overall, this suggests that elementary school is a critical period in children's educational development as it is a time when they are beginning to establish their academic self-concepts (Eshel & Klein, 1981; Guay et al., 2003; Wingfield &

Karpathian, 1991) while facing increased high-stakes and classroom-based assessment (Kruger et al., 2007). Addressing test anxiety during this developmental period can provide these early learners with the coping tools they will need to combat test anxiety and can foster the growth of long term skills that will enable them to embark on successful educational careers.

What Can Teachers Do About Test Anxiety?

The impact of test anxiety is substantial, affecting the emotional and academic well-being of thousands of school-aged children each year. Teachers are on the front lines, serving as the primary educators and mentors for students throughout their formative early academic years (Wentzel, Battle, Russell, & Looney, 2010) and strong student-teacher relationships have been shown to enhance academic performance as well as social adjustment in students (Birch & Ladd, 1996; Wentzel, 1997; Wentzel, 2002; Wentzel et al., 2010) Elementary school children in the U.S. spend approximately six and a half hours per day during the week in a classroom with one primary teacher (Hofferth & Sandberg, 2001). Research has suggested that oftentimes children who do not receive intervention within the school setting may not be able to gain access to necessary services (Weems et al., 2010), highlighting the importance of school-based service provision. Teachers are in the unique position to address test anxiety through classroom-based strategies and affect positive change in their students (Casbarro, 2005). The purpose of this section of the article is to provide elementary school teachers with information to identify test anxiety and the tools to prevent and intervene to reduce test anxiety. The presented strategies discussed are research-based and have been adapted for implementation by early education teachers within a classroom environment.

Recognizing Symptoms of Test Anxiety

Because the symptoms of test anxiety are often internalized, they can be difficult to recognize (see Table 1). There are several clues to look for when identifying a test anxious child. The most observable symptoms of test anxiety are the physiological reactions and heightened arousal that children may experience (Casbarro, 2005). The body's stress response is engaged in order to protect an individual from danger, but in the case of test anxiety, the perceived danger is out of proportion to reality (Wood & McLeod, 2008). In response to the perceived threat of an evaluative situation, a child may experience changes in body temperature, increased breathing rate, muscle tenseness, shakiness, upset stomachs and nausea, headaches, faintness, dizziness, heart palpitations and chest tightening, and changes in eating patterns, for example (Bodas, Ollendick, & Sovani, 2008; Casbarro, 2005; Kuhlman, 1982). In Barksdale-Ladd & Thomas' (2000) study, one parent discussed her child's response to a testing experience, stating:

> He came in the door, and he just looked horrible; I thought he was sick and put my hand on his head, but he didn't pay any attention and reached in his bag and pulled out these folded papers . . . (p. 394).

Based on this quotation, it seems that this child felt so anxious and upset about the results of his evaluation that he appeared to be physically ill to his mother.

Emotional responses also are characteristic symptoms of test anxiety (Casbarro, 2005). Children may present with changes in mood and may seem sullen, agitated, or just overall "not themselves today" (Casbarro, 2005, p. 79). Children may seem overly sensitive and their emotional responses may appear to be out of proportion to the situation. Teacher reports in Barksdale-Ladd & Thomas' (2000) research revealed the observed emotional reactions children display due to high-stakes testing:

Table 1. *Test Anxiety Symptoms*

Category	Possible Symptoms
Physiological	Changes in body temperature, increased breathing rate, muscle tenseness, shakiness, upset stomachs and nausea, headaches, faintness, dizziness, heart palpitations, chest tightening, and changes in eating patterns. (Barksdale-Ladd & Thomas, 2000; Bodas et al., 2008; Casbarro, 2005; Kuhlman, 1982)
Emotional	Mood changes like sullenness or oversensitivity, sadness, anger, frustration, nervousness, confusion, and fatigue. (Barksdale-Ladd & Thomas, 2000; Casbarro, 2005; Sena et al., 2007; Triplett & Barksdale, 2005; Weems et al., 2010)
Cognitive	Irrational and negative self-statements about one's ability or performance (e.g., "I'm no good at this), reduced self-esteem, feeling of failure, reduced processing speed, difficulty remembering and concentrating. (Casbarro, 2005; Hadwin et al., 2005; Lee, 1999; Miesner & Maki, 2007; McDonald, 2001; Nottelman & Hill, 1977; Peleg, 2009; Putwain et al., 2010; Putwain & Daniels, 2010; Sarason, 1988; Sena et al., 2007; Stober, 2004; Swanson & Howell, 1996; Wong, 2008)

> The kids feel the stress . . . They worry. They say, 'I'm scared. I don't want to take this.' Some of them don't sleep because they're so worried, and they cry. Straight-A students are scared that they're gonna fail (p. 391).

Triplett & Barksdale (2005) found that children reported feeling a variety of emotions, including sadness, anger, frustration, nervousness, confusion and fatigue, among others. Student illustrations included self-portraits depicting themselves dripping with sweat, frowning, and crying (Triplett & Barksdale, 2005). Children's responses suggest that test anxiety is truly an emotionally taxing experience.

Cognitive symptoms of test anxiety are the most difficult to identify because they involve the internalized thought processes that children experience. Children's cognitions may involve irrational and negative self-statements about their ability or performance (e.g., "I'm no good at this) (Casbarro, 2005; McDonald, 2001; Sarason, 1988). Children may experience reduced self-esteem and may feel as though they are failures (Casbarro, 2005; Putwain, 2009b; Stober, 2004). While these thoughts and feelings are often internalized, children may sometimes speak up about their anxiety, expressing worry about a test or that they feel nervous about speaking up in class, for example. In Barksdale-Lad & Thomas' (2000) research, one parent discussed how testing impacted her child, "I just hated it for her and while it was tearing her apart, it was tearing me apart, too. She just got so worried and was so sure she was going to fail, even though she is a good student and has been all along" (p. 394). Cognitive components can involve difficulty remembering (Casbarro, 2005; Hadwin et al., 2005) and concentrating (Casbarro, 2005; Nottelman & Hill, 1977; Swanson & Howell 1996) as well, which can impact performance during evaluative situations and may serve to perpetuate the anxiety (Russo, 1984).

Elementary school students who experience test anxiety may exhibit many of the aforementioned symptoms, but each child is different and may express his or her anxiety uniquely. Recognizing the symptoms of test anxiety is the first step toward effectively addressing it. Teachers should be aware of these symptoms and notice when they occur (i.e., before a big test or presentation, when the student is called on in class, etc.) to help determine if they may be related to the experience of test anxiety (see Table 1 for summary of test anxiety symptoms).

Strategies for the Classroom

Creating a positive classroom environment. Research has suggested that children experienced increased test anxiety in highly evaluative classroom environments (Cassady, 2004a; Zatz & Chassin, 1985). Zatz & Chassin (1985) found that children with high levels of test anxiety suffer decreased exam performance, particularly in classrooms with high levels of perceived evaluative threat. A high evaluative threat was defined as an emphasis on academic competition and a high level of teacher strictness and rule breaking related punishment (Zats & Chassin, 1985). Hancock (2001) found that all students, but test anxious individuals in particular, were impacted by highly-evaluative classrooms, reporting less motivation and reduced performance in this type of learning environment. In order to address the negative impact a highly evaluative classroom can have on children, teachers can create a supportive classroom environment that reduces competition between students (Kruger et al., 2007; Supon, 2004; Wentzel, 2002) (see Table 2). One way to do this is to incorporate cooperative learning strategies (Kruger et al., 2007), which involve placing students in learning groups, encouraging them to work towards shared goals, and fostering independent work skills (Ioannou & Artino, 2010; Johnson & Johnson, 1999; Johnson & Johnson, 2009). Activities like projects, discussions, and role plays can be included to foster cooperation and shared learning (Ioannou & Artino, 2010). These practices cultivate a collaborative spirit and evaluations are criterion references rather than norm-referenced (Ioannou & Artino, 2010; Johnson & Johnson, 1999; Johnson & Johnson, 2009) reducing inter-student competition. While teachers may feel concerned about preparing students adequately for standardized testing using collaborative learning, research has suggested that these practices actually increase

Table 2. *Test Anxiety Strategies for Teachers: Creating a Positive Classroom Climate*

Reduce competition by including cooperative learning strategies that emphasize shared goals.

- Projects – allow children to learn concepts through group projects. For example, students can produce a group poster, write a story as a team, or create a collage.
- Discussions – encourage students to discuss new concepts in small groups to enhance shared learning.
- Role plays – role plays can encourage students to work as a team while helping them enhance their understanding of stories and lessons.
  (Ioannou & Artino, 2010; Johnson & Johnson, http://www.co-operation.org/?page_id=65)

Focus classroom evaluations on learning rather than outcomes.

- Students should work toward achievement goals developed to meet each child's individual needs, rather than classroom-wide goals.
- Collaborative assessment can be used to reduce evaluative pressure and allow students to work as a team. Students can be evaluated on team projects and group products (e.g., stories, posters, presentations, artwork)

Use varied forms of assessments that include low-pressure assignments to evaluate student learning:

- Homework, projects, portfolios, class-work
  (Abu-Rabia, 2004; Ioannou & Artino, 2010; Reed, 2007)

Provide students with immediate and frequent feedback that supports learning (Marso, 1970)

- Allow students to grow from their feedback by correcting their mistakes on assignments and tests.

academic achievement, student learning, and student motivation (Ioannou & Artino, 2010; Johnson & Johnson, 1999; Johnson & Johnson, 2009).

Teachers can foster a positive classroom environment and reduce competition by ensuring that classroom evaluations are focused on learning rather than on performance outcomes. One way teachers can do this is by encouraging children to meet individual goals (e.g., William will work to improve his three times table calculations before moving on to the four times table), rather than focusing on a general target for all

students (e.g., everyone in the class should get an A on the test) (Supon, 2004). This approach views each student as unique and requiring individualized goals to foster their development as a learner. Collaborative assessment is another method that can encourage cooperation and increase the emphasis on learning rather than individual achievement in the classroom (Ioannou & Artino, 2010). Teachers can incorporate classroom evaluations that involve small group projects and activities that focus on the current class content (Ioannou & Artino, 2010; Reed, 2007). For example, a small group of two to three students can work together to write and illustrate a story using the weekly vocabulary words and read the story to the class. This type of cooperative learning activity encourages collaboration between the students in the group, while allowing the entire class to learn from one another.

Researchers (Abu-Rabia, 2004; Supon, 2004) have suggested that test anxiety can be reduced by evaluating students using low pressure activities like homework assignments, daily in-class work products, journal writing, and academic portfolios. Student portfolios allow each child to compile a history of their best work using multiple sources of information (e.g., essays, tests, projects, quizzes, homework, art assignments) as a formative representative of their learning (Supon, 2004) and gives students the chance to take ownership of their own learning outcomes (Abu-Rabia, 2004). Researchers have found that children who feel less in control of their learning were more likely to experience test anxiety (Choi, 1998; Li & Chung, 2009). Giving students the opportunity to make choices (e.g., Which story would you like to include in your portfolio?) and have more input in their performance (e.g., allowing students to correct tests to receive additional points), encourages children to take an active role in their own

education and allows them to put their best foot forward. Research has indicated that including frequent assessments followed by feedback can reduce test anxiety and increase student learning (Marso, 1970). This finding suggests that rather than including a few big tests a year, teachers should evaluate student learning regularly and provide students with information about strengths and ways to improve areas of weakness, which may be more meaningful than a grade at the top of a test (Supon, 2004).

Teachers also can help create a positive classroom environment by developing supportive relationships with their students. Triplett & Barksdale (2005) suggested that teachers can serve to reduce test anxiety and increase student confidence by acting as "comforters and coaches," encouraging student success throughout the learning and assessment process. Researchers have suggested that social support, particularly in combination with the use of appropriate coping strategies, can serve as a protective factor against stress (Kruger et al., 2007). Teacher-student relationships characterized by warmth, nurturance, caring, and support, have been found to be associated with increased student motivation and academic performance as well as improved school adjustment (Birch & Ladd, 1996; Wentzel, 1997; Wentzel, 2002; Wentzel et al., 2010) and notably, negative teacher feedback and lack of support and encouragement coincides with reduced motivation in students (Wentzel, 2002). In the role of comforter and coach (Triplett & Barksdale, 2005), elementary school teachers can help prepare students for difficult testing situations, encourage them to use coping strategies, and provide them with comfort and support as they face challenging evaluative situations.

While high stakes testing is a reality, creating a positive and supportive classroom environment that emphasizes student learning and deemphasizes competition can serve to

reduce test anxiety overall and increase students motivation and achievement (e.g., Hancock, 2001; Ioannou & Artino, 2010). Evaluating students using varied forms of assessment (e.g., collaborative assessment, homework, portfolio, in class tests) allows students to express their knowledge in different ways and put their best foot forward. Providing elementary school students with frequent and constructive feedback is more meaningful than grades because it helps children learn and grow from the assessment process. Developing supportive and caring relationships with students will contribute to a positive academic environment in which children feel encouraged and motivated to learn. Teachers can work to incorporate these elements into their classroom routine in order to support both student learning and mental health (see Table 2 as a quick reference for strategies to create a positive classroom environment).

Teaching study skills and test taking strategies. Another way teachers can address test anxiety, particularly the skills deficit component, is to directly teach study skills and test taking strategies in the classroom. Creating a learning-focused classroom environment that incorporates varied assessment helps teachers determine if individual students are learning concepts and class material (e.g, Supon, 2004). However, children may have difficulty applying their skills in an evaluative situation like a test. Researchers have suggested that children with test anxiety reported weaker study skills and more inefficient test preparation than their non-anxious counterparts, which can negatively impact test performance (Cassady, 2004b; Onwuegbuzie & Daley, 1996; Whittmaier, 1972). All students, but particularly test anxious student, may benefit from direct instruction in both study skills and test taking strategies to help them demonstrate their knowledge more effectively. Intervention research has revealed that teaching these skills

to students can help reduce test anxiety and increase test performance (e.g., Beidel, Turner, & Taylor-Ferreira, 1999; Carter et al., 2005).

Beidel et al. (1999) found that an intervention for test anxious elementary school students that focused on study skill development and test taking strategies helped decrease feelings of anxiety and increased grade point average. This intervention, called the Testbusters Program, focused on skill acquisition rather than test performance (Beidel et al., 1999), including lessons on the difference between good study habits (i.e. studying for 15-20 minutes before taking a break, finding a quiet place to work, rewarding oneself for hard work, etc.) versus bad study habits (i.e., studying with the television on or in an area with lots of people, taking more break time than study time, etc.) (Beidel et al., 1999). Children also were taught the SQ3R method (Survey, Question, Read, Recite, Review), a strategy that has been shown to improve reading comprehension (Adams, Carnine, & Gersten, 1982; Artis, 2008; Beidel et al., 1999, Martin, 1985), a skill frequently required on both low and high stakes assessments in elementary school. Other recommendations included teaching test-taking skills like careful reading of instructions, eliminating incorrect answers, underlining key words in questions (e.g., never), and ways to review test results to aid in learning and skill improvement (Beidel, et al., 1999; Supon, 2004), which have been shown to improve test performance (Cankoy, 2005; Scruggs, White, & Bennion, 1986). Teachers should also provide students with information about what simple things they can do prior to the test to feel their best, like getting a good night sleep, eating a healthy breakfast, and wearing comfortable clothes on test day (Beidel et al., 1999; Flannery, 2008; Supon, 2004).

While the Testbusters Program (Beidel et al., 1999) was implemented in small groups, elementary school teachers can easily incorporate this type of instruction into their classroom. For example, teachers may wish to include a weekly study skill bulletin that teaches or reviews a study skill or test-preparation strategy and encourages students to practice this strategy on a particular assignment. Additional test preparation and study skills strategies that teachers can discuss in the classroom to help students improve their skills include direct instruction in classroom note taking and outlining (e.g., Bohay, Blakely, Tamplin, Radvansky, 2011; Casbarro, 2005; Eskrit & McLeod, 2008; Supon, 2004) how to use graphic organizers (e.g., Casbarro, 2005; Crooks, White, & Barnard, 2007; Robinson et al., 2006; Supon, 2004), instruction in memory strategies (e.g., mnemonic devices, visualization) (e.g., Casbarro, 2005; Bellezza, 1996), planning, time management, and organizational skill development (e.g., Casbarro, 2005; Kraus & Beyl, 2007). The use of practice tests, which gives students the opportunity to see what the test will look like and get a sense of the areas in which continued practice is necessary, can also be very helpful in reducing test anxiety and increasing student preparation (Casbarro, 2005; Supon, 2004). Providing practice tests helps children know what to expect and can make them feel more confident as they face an upcoming test (Casbarro, 2005; Supon, 2004).

Knowing study strategies and test taking skills can be beneficial for elementary aged children to increase their confidence when facing tests, improve their performance, and reduce test anxiety. It is recommended that these skills be addressed regularly, rather than right before an upcoming test, so that students can have a chance to internalize the new information and practice the skills. By providing students with the tools to

adequately learn material and effectively demonstrate their knowledge in a variety of evaluative situations, teachers support the development of a learning-focused classroom environment in which evaluations show what students have learned. Including skill building lessons within a supportive and learning centered classroom environment will not only help students in the short term, but will facilitate the development of a skill set that will carry them through their careers as learners (see Table 3 as a quick reference of study skills and test taking strategies).

Using relaxation based stress reduction strategies. Stress reduction strategies are a key element in combating test anxiety, particularly with regard to physiological symptoms associated with the stress response (e.g., Wood & McLeod, 2008). As mentioned previously, students with test anxiety may experience physiological responses such as changes in body temperature, breathing rate, and heart rate, as well as muscle responses (i.e., shakiness), and gastrointestinal responses (i.e., upset stomach, nausea), to name a few (Casbarro, 2005). Relaxation strategies can help calm the body and reduce the physiological symptoms of anxiety (Matheny & McCarthy, 2000) while stress reduction strategies can address the cognitive components of test anxiety, decreasing negative self-statements and distracting thoughts (e.g., Paul, Elam, & Verhulst, 2007). Studies have found that implementing stress reduction strategies with children can be highly effective in lessening their test anxiety and increasing their academic performance (e.g., Beauchemin, Hutchins, & Patterson, 2008; Cavallaro & Meyers, 1986; Paul et al., 2007; Shao & Skarlicki, 2009).

Relaxation strategies effective in reducing test anxiety include deep breathing, mindfulness, and systematic desensitization. Research has found that the use of deep

Table 3. *Test Anxiety Strategies for Teachers: Study Skills and Test Taking Strategies*

Directly teach good study habits.

- Study in a quiet place with limited distraction.
- Develop a study plan and ask family for help.
- Organize assignments by subject.
- Study for 15-20 minutes before taking a break.
- Time management – schedule enough time, take breaks, very what is studied.
- Reward yourself for a good study session (e.g., a game/snack break).
- Provide students with practice tests when possible.
  (Beidel, Turner, & Taylor-Ferreira, 1999; Casbarro, 2005)

Teach comprehension strategies like SQ3R.

- Survey, Question, Read, Recite, Review
- Practice comprehension strategies so they are internalized.
  (Adams, Carnine, & Gersten, 1982; Artis, 2008)

Teach classroom learning skills:

- Note taking – using abbreviations, listening for key words, paying attention to the teacher's voice and inflection, watching the teacher, reviewing notes. Teachers can help students by stating the purpose of the lesson, introducing content in units, presenting clear points, repeating points, using visuals, and reviewing notes with students.
- Memory strategies – use rhymes and songs, pictures and other visual aids, mnemonic devices, and acronyms.
- Organization – use graphic organizers in lessons to model for students; help students organize their notebooks and materials by subject, date, and category; conduct weekly organization checks to keep students on track.
  (Casbarro, 2005)

breathing can help reduce test anxiety (Cavallaro & Meyers, 1986; Paul et al., 2007), and is quick and easy to implement in the classroom. Wilkinson, Buboltz, and Seemann (2001) suggested that deep breathing can help children increase calmness and concentration and reduce distraction. Casbarro (2005) included a simple script in his guide to addressing test anxiety, which asks students to sit comfortably in their chairs, breathe in and out slowly and deeply, after taking a breath, hold it for a few seconds, then exhale and let the body relax. Casbarro (2005) suggested that practicing deep breathing

for five minutes is ideal, allowing for full relaxation. However, given time constraints, one minute can be effective as practice prior to a test and even a few seconds of deep breathing during a test can help calm the body. Cheek, Bradley, Reynolds, and Coy (2002) discussed a relaxation strategy that can be quickly implemented and is easy to remember. It is called "Stop, Drop, and Roll" and capitalizes on young children's knowledge of fire safety techniques (Cheek et al., 2002). When relaxation is needed (before a test, during a test, etc.), children will stop, put their pencils down, drop their heads, take three deep breaths, and roll their head around slowly three times (Cheek et al., 2002). This strategy is easy for children to learn and can be implemented during a testing situation due to its brief nature. Cheek et al. (2002) found that this strategy was helpful to elementary school students as they reported feeling more relaxed during the testing situation and less worried about future tests.

Mindfulness strategies can be used within the classroom to help reduce test anxiety and increase academic performance (e.g., Beauchemin et al., 2008; Shao & Skarlicki, 2009). These strategies involve increasing an awareness of one's body and cognitions through relaxation and deep breathing, practices that can help students relax and become more aware of their bodies (Beauchemin et al., 2008; Greco & Hayes, 2008; Semple, Reid, & Miller, 2005). Classroom activity often involves lots of movement and noise, and as a result, it can be helpful to introduce students to a "Still Quiet Place" (Greco & Hayes, 2008, p. 142). This is somewhere students can go when they are feeling worried, anxious, sad, or angry, to help them calm their emotions (Greco & Hayes, 2008). Teachers can encourage students to experience this still and quiet place by taking several

minutes for the class to lie down, take deep breaths, and notice their thoughts and feelings (see Greco & Hayes, 2008, for script example).

Visualization strategies can help children calm their anxious thoughts and feelings (Casbarro, 2005) and enter a peaceful place. Teachers can guide students in a visualization exercise in which they imagine a place that is relaxing and safe for them (e.g., their bedroom, grandma's house, the beach). It can be helpful to have students draw a representation of their peaceful place as this can make the activity fun and make the peaceful place more concrete. Progressive muscle relaxation is another technique that can be combined with deep breathing to foster relaxation and increase bodily awareness (Casbarro, 2005; Feldman, Greeson, & Senville, 2010). It involves noticing feelings in the body and systematically tensing and relaxing each muscle group to produce overall relaxation (Casbarro, 2005; Rausch, Gramling, & Auerbach, 2006). Teachers can lead students in a progressive muscle relaxation activity prior to a test or as part of a regular relaxation regimen (see Table 4 for script example). Because it typically takes about 5 to 10 minutes to tense and relax each body part, this strategy works best when additional time is available.

Systematic desensitization is a technique that involves implementing relaxation strategies (e.g., deep breathing) while imagining the feared stimuli (e.g., taking a test) and has been shown to effectively reduce test anxiety (e.g., Cheek et al., 2002; Egbochuku & Obodo, 2005; Kipper & Giladi, 1978; Weems et al., 2008). Systematic desensitization involves the creation of an anxiety hierarchy, that is, a list of situations that make an individual feel anxious, starting with the least anxiety provoking situation and continuing to the most anxiety provoking situation (e.g., studying for a test that is a week away,

Table 4. *Test Anxiety Strategies for Teachers: Relaxation*

Teach and practice deep breathing in the classroom.

- Script for deep breathing:
  - Ask students to sit comfortably in their chairs with their feet flat on the floor.
  - Have children close their eyes.
  - Instruct them to breathe in slowly and deeply.
  - After taking a breath, hold it for three seconds, then exhale and let the body relax.
  - This should be implemented for one to five minutes.
  - (Casbarro, 2005)
- Script for Stop, Drop, and Roll:
  - STOP, put your pencil down and place your hands on the desk. Feel the coolness of the desk.
  - DROP your head and close your eyes. Take three deep breaths.
  - ROLL you head around slowly three times.
  - This can be implemented at any time. It is very brief so it is a good strategy for kids to use during a test.
    (Cheek, 2002)

Implement mindfulness strategies that increase body awareness and encourage students to enter a peaceful place.

- Mindfulness body scans can increase body awareness and reduce stress.
  - Instruct students to sit comfortably or lay comfortable on a mat with their eyes closed.
  - Ask them to notice each part of their body, attending to how it feels and accepting that feeling. At the conclusion, encourage them to relax deeply and imagine that their body is sinking into the group.
- Example Script:
  - Close your eyes and take a deep breath in and out.
  - Now, notice your toes. You do not need to move your toes, just notice how they feel. They might be tingly, or warm, or cold, or something else. Just notice how they feel.
  - Now notice both your feet. What do they feel like? Notice your heels as they rest on the floor. Notice the top of your foot and how it feels. If you can't feel anything, that is fine too. Just notice that.
  - Now notice your legs. How do they feel? No need to move them, just notice how they feel right now. Notice the front of your leg, or your shins, the back of your leg/your calves, your knees, and your upper leg/thighs. Think about what you are noticing now that you haven't noticed before.
  - Now think about your hands and fingers. Notice how they are resting at your sides/on your lap. Notice if they feel tingly, or warm, or cold, or something else.
  - Now notice your arms, notice how they feel right now. Notice how they are resting on the floor.

- Now notice your belly. (possibly refer to the fact that some people noted that this is where they feel anxiety). Notice if it feels calm or upset, hungry or satisfied, tingly or gurgly, or if it doesn't feel like much of anything.
- Now notice your chest. Notice your heart beating and the rise and fall of your breathing as you breath in and out. Notice if your chest feels relaxed or tight. Just notice what it feels like right now.
- Notice your shoulders. Sometimes shoulders are places that can feel tight. Notice how yours feel. Do they feel relaxed, tight, or do you not feel anything at all.
- Now notice your back. Notice how it is resting on the floor/your chair. Notice if it feels warm, cold, tingly, tense, etc.
- Now notice your face. What does it feel like? Notice if it is tingly or itchy, if it feels hot or flush, or cool. Just notice how you feel right now.
- When you are ready, you can open your eyes and come back to the circle. (Tenenbaum, et al., 2010).
- For additional script example for children, see Deep Relaxation for Children: http://www.deerparkmonastery.org/community/childrens-program/joyful-and-peaceful-mindfulness-with-children/deep-relaxation-for-children-and-parents/view

- Visiting a peaceful place can allow students to relax in the face of stress. Script example:
  - Close your eyes and take slow and deep breaths.
  - Imagine a warm, happy smile in your body. This is your "Still Quiet Place" (Greco & Hayes, 2008, p. 142).
  - Your still quiet place is always inside you and you can visit it whenever you like.
  - It is helpful to visit your Still Quiet Place when you are feeling anxious or angry or upset or afraid.
  - You can talk to your feelings in your still and quiet place and you may realize they are not as big and bad as you thought they were.
  - Remember you can visit your Still Quiet Place whenever you need to. (Greco & Hayes, 2008, p. 142)

Teach visualization strategies.

- Encourage children to relax while visualizing a peaceful place. Teachers can provide and describe examples to help children conceive of their own peaceful place (e.g., bedroom, grandma's house, the beach, on a boat). Children can make their peaceful place concrete by drawing or painting a representation of it (e.g., Casbarro, 2005).
- See table 6 for an additional visualization strategy.

Practice progressive muscle relaxation, which involves tensing and relaxing each muscle in the body:

- Tense each muscle for 5 seconds and relax for 10 seconds.
- Extend your arms in front of you and clench your fists.

- Extend your arms in front of you and point your fingers to the ceiling as though you are pushing on a wall.
- Touch your fingers to your shoulders so as to tense your arm muscles (biceps).
- Shut your eyes tightly and mush your eyes, forehead, and nose together
- Clench your teeth together and make a big smile like you are trying to make the sides of your mouth touch your ears.
- Put your chin to your chest and at the same time try to pull your head back
- Take a deep breath and scrunch your shoulders up to your ears
- Suck your stomach in like you want it to touch your back bone
- Extend your legs in front of you and lift your heels off the floor and tighten your thigh muscles.
- With your legs still extended, flex your feet so that your toes are pointing to the ceiling.
- With your legs extended and your heels resting on the floor, point your toes forward (only hold for three seconds to avoid cramping)
- Take 5 deep breaths and relax
  (Casbarro, 2005; Feldman, et al., 2010; Matheny, 2009; Tenenbaum et al., 2010)
- For an additional script example, please see Casbarro, 2005.

Implement systematic desensitization practices.

- This is an effective method that involves relaxing while imagining the feared stimuli, which can lead to long term reduction of anxiety surrounding the stimuli.
- Once children are familiar and comfortable with the use of relaxation strategies, they can be encouraged to practice these strategies while imagining something that makes them worried. Teachers can lead students in this activity by asking them to imagine taking the test tomorrow, for example, and then encourage everyone to practice deep breathing or stop, drop, and roll (Cheek, 2002).
- The emphasis should be focused on relaxing in the face of a worrying situation rather than emphasizing the anxiety provoking situation itself.

studying for the test that is tomorrow, waiting to receive the test on test day, taking a test and not knowing the answer to the first question). While this may seem too time consuming to implement during a busy school day, the practice can be modified to fit within the classroom schedule. Once children are familiar and comfortable with the use of relaxation strategies, they can be encouraged to practice these strategies while imagining something that makes them worried. Teachers can lead students in this activity by asking students to imagine taking the test tomorrow, for example, and then encourage

everyone to practice deep breathing or stop, drop, and roll (Cheek et al., 2002). It is important to note that the emphasis should be focused on relaxing in the face of a worry rather than emphasizing the anxiety provoking situation itself.

Relaxation based stress reduction strategies, like deep breathing, mindfulness, and systematic desensitization, can be implemented in the classroom to help reduce test anxiety. Teachers are encouraged to directly teach and practice relaxation strategies with their students on a regular basis so that they feel comfortable using relaxation in evaluative situations that make them feel anxious. Incorporating relaxation into the classroom routine will provide students with another tool to use when faced with a stressful situation, like a test (see Table 4 as a quick reference for relaxation strategies).

Incorporating physical activity. There are many health benefits to remaining physically active, one of which is stress reduction (Matheny & McCarthy, 2000; Ratey, 2008). Physical activity, particularly aerobic activity, can have significant stress reduction benefits (Doan, Plante, Digregorio, & Manuel, 1995; Matheny & McCarthy, 2000; Plante, Marcotte, Manuel, Willemsen, 1996; Ratey, 2008). Stretching exercises like yoga, especially when combined with mindfulness strategies, can provide stress relief as well (Sahajpal & Ralte, 2000; Smith, et al., 2008). Physical exercise has also been shown to prime students for learning and increase the brain's ability to process and encode new information (Ratey, 2008).

There are several ways that elementary school teachers can incorporate physical activity into their daily routine. It will be important to ensure that students are able to participate in recess or physical education class on a regular basis. Even a brief break that allows children to spend some time exercising can be beneficial. In addition to regular

recess and playground time, teachers can add brief exercise activities, like a jumping jack break, during the regular day. Stretching activities and yoga can be included as quick physical activity breaks as well. Casbarro (2005) suggested that students should plan to stretch at least every 20 to 30 minutes during an examination or seated activity and offered some ideas about how to implement this. Students can stretch in their seats by extending their legs and arms forward and stretching them, slowly circling their head using the neck or moving it side to side, rolling the shoulders, and readjusting ones seated position (Cavalarro, 2005). If possible, teachers can incorporate brief stand up and stretch breaks during a testing situation as well. Because physical activity has been shown to be a stress reducer in adults and children (e.g., Doan et al., 1995; Plante et al., 1996; Uechi, Takenaka, & Oka, 2000), it is another method that teachers can use in their classrooms to help students cope with test anxiety (see Table 5 for a quick reference of ways to incorporate physical activity into the classroom).

Boosting self-confidence. Poor academic self-concept and student self-perception are characteristic of the experience of test anxiety (e.g., Doron, Stephan, Bioche, & Le Scanff, 2009; Goetz, Preckel, Zeidner, & Schleyer, 2008; Putwain, 2009a; Zatz & Chassin, 1985). Children with test anxiety may feel less competent than their peers (Putwain, 2009a) and may experience negative cognitions in the form of self-critical statements and distracting thoughts (Zatz & Chassin, 1985). Research has demonstrated that children with test anxiety also experience significantly fewer positive self-statements (Zatz & Chassin, 1985) and less active coping (Doron et al., 2009) than their non-anxious peers. Additionally, these children often experience reduced performance during evaluative situations (Lang & Lang, 2010). To address these concerns, research has

Table 5. *Test Anxiety Strategies for Teachers: Physical Activity*

Incorporate physical activity into each day of school.

- This is often included in the regular schedule through physical education class and recess.
- Teachers can add additional physical activity experiences through yoga and stretching and brief exercise breaks.

Practice yoga, stretching, and mindfulness movement activities in the classroom.

- You can guide students in stretching activities typically done before aerobic exercise (e.g., touching toes, stretching arms above the head, stretching the mid-section) or teach them yoga activities and poses (See http://yogakids.com/ for videos and resources).
- Mindfulness body awareness activities that include movement can help incorporate physical activity and relaxation into the day.
    - Seaweed practice: each child should pretend to be a strand of seaweed anchored to the ocean floor. The class can begin by pretending to be in a strong current in which the seaweed bends and moves a great deal. As the current slowly decreases, encourage children to sway softly until they are still. During this practice, remind children to notice the feeling in their bodies as well as the thoughts and feelings in their mind (Greco & Hayes, 2008, p. 149).
    - Mindful walking: have the students walk around the room slowly and softly and pretend that they are stepping on eggshells that they are trying not to break. Encourage them to be aware of their movements, feeling their muscles tense and their feet as they lift on and off the ground. Notice their hands and arms swinging in space. Remind them to bring their thoughts to their body movements if their mind wanders (Hooker & Fodor, 2008, p. 86). Teachers can practice this activity with different types of walking. For example, the children can pretend that they are stiff tin soldiers, rag dolls, or giants.

Take brief exercise breaks when possible.

- During or after a long, seated activity, guide students in a brief exercise break that can involve jumping jacks, push-ups, stretching, or even a quick 10 minute game of tag outside.

Guide students in stretch breaks during long tests or lessons.

- Casbarro (2005) suggests stretching at least every 20 to 30 minutes during long tests or seated activities. Teachers can incorporate stretch breaks into testing or teach students ways to stretch while seated:
    - Extend your legs and arms out in front of you and tense and relax them.
    - Slowly circle your head around the neck.
    - Roll your shoulders slowly forward and backward.

    (Casbarro, 2005)

suggested that efforts should be made to increase student self-confidence and academic self-efficacy (e.g., Lang & Lang, 2010; Locker & Cropley, 2004; Putwain et al., 2010).

One way to increase student confidence and reduce test anxiety is to address the negative and distracting self-statements that children experience when they are anxious (Bistline, Jaremko, & Sobleman, 1980; Casbarro, 2005; Ergene, 2003; Russo, 1984). This method involves recognizing worrying thoughts (e.g., "What if I fail?"), negative or faulty self-statements (e.g., "I'm not smart and everyone knows it."), and distracting cognitions (e.g., "I only have five minutes left. That's not enough time. I can't do this!"), rejecting them, and replacing them with more positive, realistic, and facilitative cognitions (e.g., "I studied hard and it's likely that I will pass. If I don't, I will be disappointed, but I will figure out a plan to handle it) (Burnett, 1994; Casbarro, 2005). Teachers can introduce this concept as positive self-talk. Casbarro (2005) provided a guide for teachers to help their students implement positive self-talk strategies. He suggested a five step method that involves asking students to think about an anxiety producing situation (e.g., test, presentation), think about the negative self-statements that occurred during this situation (e.g., "I'm too nervous. I can't do this."), and provide examples, examine how these negative self-statements increase their anxiety, collect the statements as a class and replace them with positive statements, and practice applying the skills to the actual situation (Casbarro, 2005). It will be particularly important for teachers to model this activity, as research has revealed that teachers' use of positive statements can increase students' use of positive self-talk (Burnett, 1999). This type of activity can be facilitated as a whole group activity, after which children can work

individually on restructuring their own negative self-statements. To provide students with ownership and make the activity more concrete, this activity can be done as a self-portrait project. Children can draw a representation of themselves, include a negative self-statement in a thought bubble, and replace that negative statement with a positive one by placing a piece of paper with the positive thought over the negative thought bubble (Tenenbaum, Cadenhead, Varjas, & Skillman, 2010). Teachers can display a class self-talk chart that includes a class list of negative self-statements, associated feelings, and replacement positive self-statements to help students visualize and internalize this coping strategy (Casbarro, 2005).

Incorporating positive self-talk with visualization is another way to increase student confidence and reduce test anxiety (Bistline et al., 1980; Russo, 1984). Teachers can lead their class in a visualization activity by first asking them to close their eyes and relax while imagining an evaluative situation, which can be something students think of independently or an example provided by the teacher to help children conceptualize this task (Bistline et al., 1980). Students should then be instructed to imagine themselves successfully addressing the evaluative situation and practice positive self-statements that they will use during the situation (Bistline et al., 1980; Russo, 1984). Art projects can accompany theses visualization strategies, allowing students to translate their successful imagery into a concrete artistic creation like a drawing, collage, or painting.

Teacher encouragement plays a vital role in the development of students' self-esteem and academic self-concept (Wentzel, 2002). Triplett & Barksdale (2005) found that simple statements of support from teachers can be very meaningful as students experience anxiety provoking situations. Saying something like "Good Luck" or "I know

you can do it and I'm here to help you through this," can let students know that you are there to be their supporter and coach (Triplett & Barksdale, 2005). Research has suggested that children experience more anxiety when they perceive their classmates to be more intelligent than they (Goetz et al., 2008). As a result, it may be helpful to encourage students to achieve individual goals and provide them with praise and encouragement for their unique accomplishments (e.g., "I can tell you've been working hard on improving your use of exclamation points!").

Teachers should work to ensure that each student has an opportunity to feel successful. Research has shown that children with test anxiety experience reduced anxiety and increased performance when they are given an opportunity to be successful prior to an evaluation (Lang & Lang, 2010). This can be included within the classroom by allowing children to participate in activities that highlight their individual strengths. Additionally, when creating in-class tests, it may be helpful to begin the test with items that have a greater likelihood of being answered correctly. This will give students a sense of accomplishment at the start of the test that can help give them confidence to carry them through the remainder.

In the role of comforter and coach (Triplett & Barksdale, 2005), caring and supportive teachers can help provide elementary school students with tools to increase their confidence and interest in learning (Wentzel, 2002). Educating students in the use of coping strategies that directly address debilitating cognitions can provide them with an important tool to facilitate positive self-statements and feel more confident and competent when faced with an evaluative situation. Encouraging students to meet individual goals provides them with a benchmark to measure their own accomplishments.

Additionally, supportive and encouraging statements can make a difference in how children think and feel about their ability to achieve a goal. Finally, providing students with opportunities to experience success can boost confidence, reduce test anxiety, and increase performance (see Table 6 for a quick reference of confidence boosting strategies to use in the classroom).

Strategies for test day. There are several things that teachers can do on the day of a test to ensure that students are at their best. While standardized testing situations often involve a prescribed script and formal testing operations, it is important to note that teachers can and should still provide individualized support to their students within this format (Roach & Frank, 2007). Teachers can remind students to get a good night's sleep and eat a healthy breakfast prior to test day ("Test Stress," 2005). Researchers (Flannery, 2008; Supon, 2004) have suggested that teachers should focus their attention on tests as a measure of learning that will show what a child knows and what a child still needs to learn. Teachers should reduce emphasis on outcomes (i.e., what will happen if you fail, how good the class will look if everyone does well, etc.) and encourage students to apply what they have learned while expressing confidence in their ability to succeed (Flannery, 2008; Supon, 2004). To help reduce anxiety and make students more relaxed on test day, teachers can allow children to remove their shoes, for example, and encourage them to wear comfortable loose fitting clothes and bring layers in case they become hot or cold (Flannery, 2008; "Test Stress," 2005). It also will be important to ensure that the room is comfortable (e.g., temperature and lighting) and free from distractions (e.g., phones ringing, doors opening and closing) (Supon, 2004). Furthermore, it may be beneficial to

Table 6. *Test Anxiety Strategies for Teachers: Building Student Confidence*

Teach and practice positive self-talk, which involves recognizing negative self-statements that facilitate anxiety and replacement them with more positive and realistic statements.

- Ask students to imagine the anxiety producing situation and what thoughts may come up. Provide examples (e.g., I can't do this; I'm not smart; What if I fail?)
- Examine how these negative self-statements increase anxiety.
- Collect the negative statements and replace them with positive statements as a class (e.g., I will try hard and I can do this; I am smart; I probably won't fail, but if I do, my teacher will help me figure out how to handle it).
- Model this activity and provide examples for the students to learn from.
- Possibly display a "self-talk" chart with negative self-statements, associated feelings, and replacement positive statements.
  (Burnett, 1999; Casbarro, 2005)
- Teachers can translate this into an art activity by having children create a self portrait, include a negative self-statement in a thought bubble, and replace that negative statement with a positive one by placing a piece of paper with the positive thought over the negative thought bubble (Tenenbaum, Cadenhead, Varjas, & Skillman, 2010)

Practice positive self-talk with visualization.

- Ask students to close their eyes and relax (e.g., deep breathing exercise) while imagining an evaluative situation (teachers can provide the example of an upcoming test or encourage students to think of their own).
- Instruct students to then imagine themselves successfully facing the evaluative situation and practice using positive self-statements while imagining this situation.
  (Bistline et al., 1980; Russo, 1984)

Provide students with regular and meaningful encouragement.

- Instead of providing general feedback (i.e., Great job everyone!), give students specific encouragement (e.g., You really improved your use of introductory phrases on this writing assignment; I see you have been practicing your eight times tables).
- It is helpful to offer encouraging statements prior to a test (e.g., Good luck! I believe in you.)
  (Triplett & Barksdale, 2005)

Give students opportunities to be successful, particularly during an evaluation.

- Start off examinations with an easier question, giving students a feeling of accomplishment early on.
- Allow students to participate in different activities at school that capitalize on areas of strength.
  (e.g., Lang & Lang, 2010)

allow children to bring something comforting with them to class on test day, like a stuffed animal or a special blanket, to help them feel more relaxed (Flannery, 2008).

On test day, teachers can remind students of the different coping strategies that they can use like positive self-talk, deep breathing, and test taking strategies. Prior to the test, teachers may wish to help students implement their stress management strategies by leading a brief class relaxation activity so that everyone can benefit. When it comes time for students to take the big test, it will be important to provide clear information and instructions and encourage questions, as research has indicated that teacher clarity can improve both motivation and achievement (Rodger, Murray, & Cummings, 2007; Supon, 2004). Providing some words of encouragement before and throughout the testing period can help students feel supported (Triplett & Barksdale, 2005). In the role of both coach and comforter (Triplett & Barksdale, 2005), a teacher can help children navigate stressful testing situations effectively (see Table 7 for a quick reference of classroom-based strategies to reduce test anxiety).

Using available personnel resources. While there is a lot that elementary school teachers can do to help their students manage test anxiety, teachers can look to the available personnel resources within the school system for additional support. School psychologists and counselors are experts in stress management and are available to help teachers with the mental health needs of their students. These school mental health professionals are on hand for consultation (Brown, Pryzwansky, & Schulte, 2006) and can provide resources and ideas that teachers can use in the classroom as they implement intervention and prevention services to address student anxiety. Additionally, school

Table 7. *Test Anxiety Strategies for Teachers: What to do on Test Day*

Serve as comforter and coach.

- Be a support for students when they feel anxious by offering caring and encouraging words and suggesting strategies that they can use. Guide them in the implementation of relaxation strategies and remind them of the test taking skills they can use.
  (Triplett & Barksdale, 2005; Wentzel, 2002)

Emphasize learning rather than achievement outcomes.

- Focus on tests as one way to measure what students have learned and as a tool to help determine where students can continue to learn and grow (Flannery, 2008).

Be sure to remind students to plan ahead to get a good night's sleep and eat a healthy breakfast in the morning ("Test Stress," 2005, See http://pbskids.org/itsmylife/school/teststress/article9.html)

Encourage students to dress comfortably and bring something soothing with them, such as a stuffed toy (Flannery, 2008; "Test Stress," 2005).

Remind students about coping strategies that can be used during the test.

Lead students in a relaxation activity, such as deep breathing, a mindfulness body scan, or progressive muscle relaxation prior to the start of the test.

Provide clear information about the testing and allow time for student questions (Rodger, Murray, & Cummings, 2007).

Offer words of encouragement (e.g., You've worked hard and have learned a lot!).

counselors and psychologists can offer classroom guidance lessons to specifically address test anxiety and stress management.

Teacher or counselor implemented classroom-wide prevention and intervention efforts to address test anxiety would be considered tier one level services, consistent with the response to intervention (RTI) model currently in use within U.S. public schools (Vaughn & Bos, 2009). The RTI model typically contains three tiers, with tier one level services incorporating research-based instruction for all students as a means to provide

early intervention or preventative efforts to address an area of concern, like test anxiety (Hulac, Terrell, Vining, & Bernstein, 2011; Vaughn & Bos, 2009). Teachers can collaborate with school-based mental health practitioners to assist students beyond the tier one level as well (Brown et al., 2006). Tier two and three services provide more targeted interventions for students identified as experiencing more severe symptoms that do not respond to universal intervention efforts (Hulac et al., 2011; Vaughn & Bos, 2009). These more intensive services could involve small group interventions that address test anxiety reduction or individualized counseling specifically designed to meet a student's needs. Wilkinson (1990) suggested that teachers collaborate with school psychologists and counselors to develop a plan to address test anxiety, encouraging a team approach that fosters continuity throughout the school setting to address each student's need for services.

Identifying Students Who Need More

Despite a teacher's best efforts, some students may continue to experience marked anxiety and may require additional support. While the classroom-wide strategies discussed in this article provide a guide for universal preventative services that teachers can provide at the tier one level, consistent with RTI (Vaughn & Bos, 2009), tier two and three supports may be necessary for some students. Research has demonstrated that there are significant benefits to treating anxiety early in children (e.g., Fox et al., 2008; Hirshfeld-Becker et al., 2008). Tier two support could include school-based small group counseling interventions, which have been shown to effectively reduce test anxiety and provide students with needed support (e.g., Cheek et al., 2002; Tenenbaum et al., 2010; Weems et al., 2009). Research also has found that children who experience test anxiety

may be apt to suffer from symptoms of clinical anxiety and be diagnosed with an anxiety disorder (Beidel & Turner 1988; Weems et al., 2010) and those children would likely benefit from tier three support, possibly through clinic based individual or group therapy or pharmacotherapy to address their mental health needs. Collaboration between teachers, school counselors, and school psychologists can help identify students who require added support at the tier two or three level.

Conclusions

In today's academic environment, high stakes testing is a reality that teachers and students must face as part of the educational experience. Research has suggested that test anxiety occurs in highly evaluative situations (Kruger et al., 2007; McDonald, 2001; Putwain, 2009a; Strumpf & Fodor, 1993), like high stakes testing, which negatively impacts school children both academically and psychosocially (e.g., Abu-Rabia, 2004; Putwain, 2008; Putwain & Daniels, 2010; Fengquiang et al., 2006; Weems et al., 2010). Teachers are in the unique position to provide guidance and mentorship to their students in the school setting to help them address test anxiety and its effects at a universal preventative level. There are a number of strategies teachers can use in the classroom to help reduce test anxiety, including creating a positive classroom environment, providing training in study skills and test taking strategies, implementing a relaxation program, incorporating physical activity, and helping students boost their confidence. Research has shown that often these strategies are most effective when used in conjunction with one another (Ergene, 2003; Gregor, 2005), suggesting that teachers may wish to incorporate multiple test anxiety management strategies into their regular routine. Through the use of classroom strategies and consultation with school-based mental health practitioners,

teachers can help provide their students with the skills and strategies necessary to effectively address school-based evaluative situations with confidence and success.

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CHAPTER 2

A SCHOOL-BASED INTERVENTION FOR THIRD GRADE STUDENTS EXPERIENCING TEST ANXIETY

The topic of anxiety has been widely studied within the mental health field, with research suggesting that anxiety disorders are the most common psychological ailment experienced by adults, with lifetime prevalence estimates of nearly 30% of the population (e.g., Kessler et al., 2005). While the majority of research on anxiety has focused on the adult population, more recently the mental health community has begun to recognize and explore this phenomenon within children (Muris & Broeren, 2009). In fact, researchers have found that anxiety disorders occur frequently in youth, with studies suggesting that between 10 and 30% of children may be affected (American Psychiatric Association, 2000; Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Schaffer et al., 1996). Evidence of anxiety disorders in preschool aged children has been found, with rates of up to 10% reportedly occurring in children aged two through five (Egger & Angold, 2006). Treatment of childhood anxiety disorders often has occurred in outpatient clinic settings, with a therapist utilizing strategies like relaxation and cognitive-behavioral techniques (e.g., Bernstein, Bernat, Victor, & Layne, 2008; Manassis et al., 2002). While clinic-based treatment has effectively reduced anxiety (e.g., Lumpkin, Silverman, Weems, Markham, & Kurtines, 2002; Manassis et al., 2002), children in the U.S. spend a significant amount of time within a school environment (Hofferth & Sandberg, 2001), and often will not receive services for anxiety related concerns unless they are treated at school (Weems et al., 2010). As a result, it may be important for school practitioners to address sources of anxiety within the school setting.

The federal education policy of the No Child Left Behind Act (NCLB, 2001) has influenced school climate by mandating state and national standardized testing in order to increase the educational accountability of schools and teachers while contributing to educational research on instructional outcomes (Vannest, Mahadevan, Mason, & Temple-Harvey, 2009). According to NCLB (2001), all public schools are expected to meet adequate yearly progress in student achievement determined by student outcomes on standardized assessments. Student performance on these high-stakes tests may impact success or failure within the classroom, grade promotion and retention, as well as the ability of the entire school and district to reach national standards (Kruger, Wandle, & Struzziero, 2007; Nichols, 2007). In addition to high-stakes assessments, children face other evaluative situations within the school setting, including classroom curriculum-based exams, class presentations, school performances (e.g., school plays, band recitals, spelling bees), and athletic competitions, among others. Researchers have established that this performance-based pressure can cause anxiety for some children (Kruger, Wandle, & Struzziero, 2007; McDonald, 2001; Putwain, 2009a; Strumpf & Fodor, 1993).

Test Anxiety: Theories, Prevalence, and Outcomes

When children experience significant anxiety surrounding performance-based evaluations, it can be referred to as "test anxiety" (McDonald, 2001). Spielberger (1966), one of the seminal researchers on the topic of test anxiety, described the phenomenon as an 'ego threat' including fear of judgment, damage to self-esteem, and negative outcomes of testing. McDonald (2001) defined test anxiety as the experience of strong emotional reactions when faced with an evaluative situation. Symptoms of test anxiety often include tension, nervousness, and preoccupying worry that may interfere with thoughts and

increased somatic and autonomic responses (Cavallaro & Meyers, 1986). While test anxiety is not a disorder classified within the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR; American Psychiatric Association, 2000), McDonald (2001) indicated that test anxiety most closely aligns with the classification of social phobia, which centers on the fear of performance in social situations due to the threat of embarrassment.

Some theorists have suggested that test anxiety is a construct composed of two elements: (1) emotionality, and (2) worry (Liebert & Morris, 1967; McDonald, 2001). Emotionality can be defined as the physiological reaction and heightened autonomic response experienced during high anxiety situations (McDonald, 2001; Sarason, 1988). Worry is the cognitive component that involves preoccupying and self-focused thoughts surrounding evaluation and performance (McDonald, 2001; Sarason, 1988). Other researchers (Hodapp, 1991; Stober, 2004) have proposed that test anxiety may include four elements: (1) emotionality, (2) worry, (3) interference, and (4) lack of confidence. This four factor model adds the concepts of interference, defined as the cognitive component of distracting thoughts that interfere with performance, while addressing the impact of low self-confidence (Stober, 2004). In support of the four factor model, Putwain, Connors, & Symes' (2010) research revealed that interfering cognitions, such as catastrophizing, overgeneralizing, and personalizing, were associated with symptoms of worry and emotionality in test anxious teenagers. Furthermore, Putwain (2009b) discovered a link between test anxiety and academic self-concept, indicating that students with test anxiety experienced increased distress when they reported feeling less confident about their ability to succeed on an exam, illustrating the link between lack of self-

confidence and test anxiety. Li & Chung (2009) found that test anxiety was mediated by locus of control, indicating that an external locus of control was associated with higher levels of anxiety when faced with a testing situation.

There are few recent studies that provide information on the prevalence of test anxiety in children. Research on prevalence has been hampered by the lack of standardized test anxiety measures with adequate norms designed for children (McDonald, 2001). One early estimate (Nottelmann & Hill, 1977) found that between 25 and 30% of fifth and sixth grade children reported experiencing test anxiety, as measured by the Test Anxiety Scale for Children (TASC) (Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960). A more recent study (Turner et al., 1993) found that 41% of African American children in grades three through six reported experiencing test anxiety, using the Test Anxiety Scale for Children (Sarason et al., 1960), the Fear Survey Schedule for Children (Ollendick, 1983), and the Perceived Self-Competence Scale for Children (Harter, 1982). Strumpf & Fodor (1993) proposed that some estimates may have been an underrepresentation of the pervasiveness of test anxiety because internalizing disorders such as anxiety often go unnoticed by adults and school personnel. McDonald (2001) indicated that test anxiety may be underreported because test anxious children may either remove themselves from the system due to a fear of testing or they may be unable to progress in their education as a result of the negative impact test anxiety can have on school achievement. Studies on gender have suggested that test anxiety may affect more females than males (Chapel et al., 2005; Guida & Ludlow, 1989; Hembree, 1988; Locker & Cropley, 2004; Sena, Lowe, & Lee, 2007), which is consistent with the literature regarding gender differences in anxiety disorders (Costello et al., 2003). Researchers also

have demonstrated an increased incidence of test anxiety among children with learning disabilities (Sena et al., 2007), minority students (Bryan, Sonnenfeld, & Grabowski, 1983; Turner et al., 1993), children with a low socioeconomic status (Guida & Ludlow, 1989), and students who speak English as a second language (Hodge, McCormick, & Elliot, 1997).

There are several outcomes (e.g., reduced achievement, psychological distress, reduced self-esteem) of test anxiety that highlight the negative impact it can have on children's lives. Multiple studies have demonstrated that the experience of test anxiety can reduce test performance and achievement in middle school, high school, and college students (e.g., Cassady, 2004a; Cassady, 2004b; Fengquiang, Peng, Yu, & Shihai, 2006; Lee, 1999; Putwain, 2010; Putwain, 2008; Turner et al., 1993). Researchers have revealed that test anxiety can cause cognitive interference and cognitive distortions in school-aged children (Putwain, Connors, & Symes, 2010; Sena et al., 2007), impact working memory and processing efficiency in elementary students (Hadwin, Brogan, & Stevenson, 2005), and reduce comprehension in college aged adults (Cassady, 2004b). Concentration difficulties (Swanson & Howell, 1996) have been associated with test anxious high-school children as well. Test anxiety may impact the learning process as well, interfering with encoding, storage, retrieval, and organization in school-aged and college aged students (Cassady, 2004b; Hembree, 1988). Researchers have found that high school and college students who felt less competent (Putwain & Daniel, 2009) and had less self-efficacy (Ferraro, 2005) were more likely to experience test anxiety and reduced test performance (Ferraro, 2005). Thus, students' lack of confidence and the subsequent test anxiety may result in poor performance, confirming inaccurate beliefs about ability, and

perpetuating a cycle of anxiety and poor achievement. Furthermore, test anxiety may lead to reduced motivation to achieve, particularly in highly evaluative classrooms (Hancock, 2001).

Test anxiety can have social and emotional implications, including heightened worry, emotionality, and nervousness (Barksdale-Ladd & Thomas, 2000; Sena et al., 2007), as well as reduced self-esteem in elementary and high school students (Hembree, 1988; Locker & Cropley, 2004). Weems et al., (2010) found evidence that test anxiety may be associated with clinical symptoms of depression and anxiety disorders in ninth grade students, suggesting potential negative mental health outcomes. Test anxiety also has been shown to be associated with an external locus of control in college students (Choi, 1998). That is, students who felt less in control of their experiences, as opposed to students who believed that they had more control, were more likely to experience test anxiety (Choi, 1998). Considering both the academic and psychosocial implication associated with test anxiety, it is no surprise that Hembree's (1988) meta-analysis of test anxiety research found that students experiencing test anxiety are at greater risk for grade retention and older research (Spielberger, 1966) has suggested that students may be vulnerable to subsequent school dropout.

Interventions

Cognitive Behavioral Therapy

Research-based interventions to address childhood anxiety and its outcomes have primarily focused on cognitive behavioral therapy techniques, including relaxation and systematic desensitization. Cognitive behavioral therapy (CBT; Beck, 1970; Clark & Beck, 2010) involves addressing both the irrational and automatic thought patterns

associated with anxiety as well as the connected behaviors that perpetuate the anxiety (Fall, Holden, & Marquis, 2004). CBT is one of the most widely used methods to address anxiety (Chambless & Ollendick, 2001) and researchers have demonstrated its effectiveness in reducing anxiety for both adults (e.g., Chambless & Ollendick, 2001; Norton & Price, 2007) and children (e.g., Hirschfeld-Becker et al., 2010; Kendall, 2006; Kendall, Hudson, Gosch, Flannery-Schroeder, and Suveg, 2008; Waters, Wharton, Zimmer-Gembeck, and Craske, 2008). Examples of cognitive behavioral interventions with children to address anxiety and test anxiety in the literature will be reviewed in detail.

Intervention research using CBT with elementary-aged children who experience test anxiety is limited, though there are several studies that effectively address anxiety in general with this age group. Waters at al. (2008) implemented CBT focused group interventions within a clinic setting to help reduce anxiety in children aged eight to 12 years who were diagnosed with an anxiety disorder. This intervention took place in groups of nine to 10 children with 10 one hour long sessions over 10 weeks and a booster session one month later. Sessions addressed components of CBT, including cognitive restructuring, relaxation-based strategies, and coping skills. The intervention also included a parent component, teaching parents about CBT and ways to help their children learn to manage their anxiety. The researchers learned that this intervention was effective in reducing anxiety and children post-treatment exhibited similar levels of anxiety to a non-anxious control group (Waters et al., 2008). Kendall et al. (2008) implemented individual and family CBT in a clinic setting with children aged seven through 14 over 16 weekly sessions that were each an hour long. The *Coping Cat* Program (Kendall &

Hedtke, 2006), a CBT treatment manual for children and families, was used in this research and involved teaching children to recognize anxious thoughts and feelings and implement appropriate coping strategies. Findings from this study demonstrated significant reductions in anxiety disorders for both the individual and parent involvement CBT groups.

Manassis et al. (2002) implemented both group and individual CBT treatment with children aged eight to 12 previously diagnosed with an anxiety disorder. Treatment was manualized, occurring over 12 weeks, and involved a parent component. Results revealed that both group and individually administered clinic-based CBT was effective in reducing anxiety and increasing overall global functioning of children. While the majority of CBT research on anxiety in children discusses clinic-based treatment, one study (Bernstein et al., 2008) implemented a CBT focused intervention for anxious children in a school setting. Children aged seven through 11 participated in a small group (8 to 10 children) intervention for nine hour long weekly sessions and two booster session treatments. All sessions occurred during the after school hours on school grounds and one group included a parent training component. Results revealed that both the parent involvement condition and the student only condition were successful in reducing anxiety and bringing anxiety disorders into remission when compared to control. However, the parent involvement group experienced results of greater significance.

Cognitive behavioral therapy frequently incorporates relaxation training as an element of therapy to address the behavioral component of anxiety reduction (e.g., Cavallaro & Meyers, 1986; Cheek, Bradley, Reynolds, & Coy, 2002; Gregor, 2005). Mindfulness-based relaxation strategies that involve deep breathing practice while

incorporating increased awareness of one's body and thoughts have been shown to effectively reduce test anxiety (Beauchemin et al., 2008; Greco & Hayes, 2008). In a school-based intervention specifically designed to reduce test anxiety in elementary aged students (grades three through five), children participated in three small group sessions and three classroom guidance sessions with a counselor (Cheek et al., 2002). Cheek et al. (2002) found that implementing this intervention using both cognitive behavioral strategies and relaxation training helped reduce anxiety based on parent, teacher, and student report, and helped increase test performance. Deuskar (2008) found that an intervention with test anxious ninth graders involving six months of training in yogic relaxation techniques significantly reduced the emotionality component of test anxiety, but the worry component was not significantly changed. Deuskar (2008) suggested that while relaxation training can reduce the autonomic arousal associated with test anxiety, intervention would be most effective when combined with cognitive therapy in order to address both the cognitive and emotionality components. Gregor (2005) implemented a school-based intervention combining CBT and relaxation training with high achieving high school students and found that combining these strategies was more effective in reducing anxiety and increasing academic performance than CBT or relaxation training alone. Cavallaro and Meyers (1986) had similar findings in a school-based intervention to reduce test anxiety in high school females, providing further evidence to support the effectiveness of cognitive therapy combined with relaxation training in reducing test anxiety.

Some studies discussed systematic desensitization as a treatment for test anxiety in children (e.g., Egbochuku & Obodo, 2005; Kipper & Giladi, 1978; Weems et al.,

2009). This is a behavioral technique incorporating relaxation training with gradual exposure to the anxiety provoking stimuli in order to help individuals reduce their anxiety toward the particular stimulus over time (Wolpe, 1973). Egbochuku and Obodo (2005) discovered that group treatment over a six week, 12 session training program using systematic desensitization on its own was effective in reducing test anxiety in a sample of adolescents previously identified as test anxious. Kipper and Giladi (1978) found that group systematic desensitization implemented over 13 weekly sessions significantly reduced test anxiety in college students who sought treatment from a mental health professional. Weems et al. (2009) also examined systematic desensitization as a treatment for test anxiety and found that school-based training in CBT, relaxation training, and systematic desensitization using exposure helped reduce test anxiety and increase performance in test anxious high school children.

Study Skills Training and Test Taking Strategies

While CBT, incorporating relaxation strategies and systematic desensitization, has been shown to successfully address test anxiety, research on effective test anxiety interventions frequently have included study skills training and instruction in test taking strategies to address skills deficits that may be present in test anxious students. Beidel, Turner, and Taylor-Ferreira (1999) surmised that children with low skill and high anxiety would benefit from training to improve their skills and boost their confidence to reduce their anxiety. Beidel et al.'s (1999) Testbusters Program, designed for children in grades four through seven, involved direct instruction in study skills and test taking strategies and was implemented in a group format (eight participants per group) within a school setting over a period of 11 weeks. Results indicated that students reported reduced

anxiety and demonstrated improved academic performance; however, no increases in self-esteem were found (Beidel et al., 1999). A meta-analysis of test anxiety interventions found evidence to suggest that a combination of skill-focused approaches with CBT was the most effective intervention method to address test anxiety (Ergene, 2003).

Rationale

While there are a multitude of studies addressing interventions for anxiety in adults, there are fewer studies examining childhood anxiety (Hirshfeld-Becker et al., 2008), and research is even more limited when it comes to specifically investigating the phenomenon of test anxiety. Research suggested that test anxiety is prevalent in youth (e.g., Turner et al., 1993), and may be highly correlated with symptoms of anxiety disorders (e.g., Hembree, 1998). Within the literature on test anxiety, there is a significant lack of research focusing on elementary-aged children (Gregor, 2005), despite the fact that children this age are faced with many performance-based pressures like their older counterparts. Li & Chung (2009) found that younger children may even experience more anxiety than older children when faced with an examination, possibly because of the higher external locus of control reported by younger children. Due to the emphasis on testing and evaluation in the current educational climate and the academic and psychological ill effects test anxiety can have on children, test anxiety has become a significant area of concern for mental health practitioners who intervene with children in the school setting.

Research supported the use of early intervention to address anxiety disorders as this approach can be highly beneficial in reducing anxiety symptoms and increasing coping skills (Hirshfeld-Becker et al., 2008; Kruger et al., 2007) in both the short term

and over time (Bernstein et al., 2008). While test anxiety often occurs within the school setting, there is a lack of research examining school-based interventions (Gregor, 2005), with more information available about clinic treatment. Weems et al. (2010) discussed the importance of school-based interventions, suggesting that it is a way to serve students who may not receive treatment outside the school setting. Additionally, there is limited research examining the phenomenon of test anxiety from a mixed methods approach. Mixed methods research investigates a topic of interest by gathering both qualitative and quantitative data as a means to address research questions most effectively (Teddlie & Tashakkori, 2009). Overall, a review of the literature combined with recommendations from prominent researchers in the field (e.g., Ergene, 2003; Gregor, 2005) suggested that there was a need for mixed methods research examining test anxiety interventions with elementary aged children within school-based settings.

To address these gaps within the intervention literature, the purpose of the current pilot study was to develop and evaluate a school-based intervention designed to reduce test anxiety and increase coping skills in third grade students. Mixed methods (e.g., Teddlie & Tashakkori, 2009) were utilized to evaluate the acceptability, integrity, and efficacy of the intervention. The pilot study asked the following questions: (1) Would a small group pilot intervention with third grade students addressing test anxiety and stress management be implemented with acceptability and integrity? (2) Would the intervention increase students' awareness and use of stress management strategies, increase their cognitive flexibility and inhibition of automatic thoughts, and increase their self-confidence and self-efficacy in their ability to face testing situations? and (3) Would the pilot intervention decrease symptoms of test anxiety and anxiety in general?

Method

Context

The pilot intervention was conducted in two elementary schools within a small urban public school district within the Southeastern United States. Each school housed kindergarten through third grade. The first school's total population during the 2008-2009 academic year was 319 students, with 84 students enrolled in the third grade. The gender breakdown was 48% male and 52% female. The racial breakdown was 62% White, 32% African American, 2% Hispanic, 1% Asian, and 3% unknown. Of these students, 31% were eligible for free lunch and 1% was eligible for reduced lunch. The second school included a total of 302 students, with 81 children enrolled in the third grade. The gender breakdown was 44% male and 56% female. Of these students, 57% were White, 30% African American, 3% Hispanic, 3% Asian, and 7% unknown. Additionally, 22% of these students were eligible for free lunch and 4% were eligible for reduced lunch.

Participants

Participants for the study were obtained through classroom teacher referral. The primary author conducted information sessions with all teachers from the two participating elementary schools to describe the topic of test anxiety, discuss how it affects school-aged children, and review strategies to help children experiencing this type of stress. During the information sessions, teachers were informed about the current research study and the opportunity for third grade students experiencing test anxiety to participate in the intervention. Of the eight third grade classrooms within the two schools, five classroom teachers agreed to participate by returning consent forms. Each participating teacher was asked to select students experiencing test anxiety who they

believed would benefit from a school-based small group intervention, and complete a brief screening checklist of test anxiety symptoms about the referred student. The screening checklist was designed by the primary author to include different physiological, emotional, and cognitive symptoms that are often present in children who experience test anxiety (e.g., when faced with a test, the student has expressed fear of poor performance; has expressed feelings of upset stomach, nausea, or headache; has demonstrated dramatic changes in mood). If teachers endorsed two or more out of the total six sets of symptoms on the screening checklist, that child was included within the sample. All but one student referred by teachers met the criteria for inclusion. This student was referred primarily due to difficulty with attention and concentration without any self-reported or observed anxiety related symptoms and thus was deemed inappropriate for the group. This student was referred to the school counselor for additional support services to address his needs.

Seventeen third grade students were identified as appropriate participants for the intervention based on teacher referral through the screening checklist. All parents of referred students received an informational handout and parent consent form to return if they chose to have their child participate. Both the primary author and the elementary school's counselor were available to answer questions from parents in person or via telephone regarding the risks and benefits of participation and the process and content of the intervention. Of these 17 referred students, 16 returned parent consent forms. The intervention was explained to students individually and each student was asked to provide his or her assent to participate in the project. All 16 participants agreed to participate by providing assent. Three mixed gender groups were established, including two groups of five students at the first school and one group of six students at the second school. Of the

participating students, all were third graders, five were male (31%), 11 were female (69%), and they ranged in age from 8 to 10 years (M_{age} = 9.08; *SD* = .62). Eleven students were Caucasian (69%), two were African American (12.5%), two were Hispanic (12.5%), and one was Asian (6%). Children participated in an eight session intervention over a period of six weeks and met in small groups for 30 minute sessions led by two group facilitators (a lead facilitator and a support facilitator). At the end of each session, students completed an evaluation to allow them to express their opinions about the session

Group Facilitators

Four facilitators participated in the implementation and evaluation of the group intervention. The facilitators were graduate students at a large urban Southeastern University. All facilitators were female and were currently completing or had previously completed internships within the school district to meet practical requirements for their graduate programs. Two facilitators were doctoral students in school psychology, one was a specialist level student in school psychology, and one was a master's level student in school counseling. Each intervention group included two facilitators. The primary author was the lead facilitator for each group while the three other graduate students were support facilitators and rotated to different groups each session.

Group facilitators participated in a 12 hour training led by a licensed psychologist, school counselor, and university professors in school psychology. This training focused on group process, facilitation techniques, crisis intervention, and behavior management. Facilitators learned about the intervention curriculum and its implementation, the facilitator acceptability and integrity measures, and the student measures that would be

used. The facilitators debriefed following each intervention session to discuss the process of the session and plan for future meetings. Furthermore, the primary author received supervision from a licensed psychologist through weekly meetings during the intervention implementation. The purpose of the supervision meetings was to review the intervention session, discuss the group process, and address successes and struggles during the experience.

Measures

This research was evaluated using mixed-methodology (e.g., Teddlie & Tashakkori, 2009), incorporating both quantitative and qualitative measurement tools. In the current study, mixed methods involved the use of varied procedures for data collection and multiple sources of data to evaluate the acceptability, integrity, and efficacy of the intervention. Mixed methods also were used to guarantee the integrity and credibility of the intervention findings (Lincoln & Guba, 1985). All pre- and post-test measures were administered individually to the child by one facilitator who explained the testing process and read test items to all students. In the discussion of measures, first the quantitative measures used in this study will be reviewed, followed by the qualitative measures.

Behavioral Assessment System for Children – 2. The Behavioral Assessment System for Children – 2 (BASC-2; Reynolds & Kamphaus, 2004) is a quantitative measure designed to assess emotions, behaviors, and perceptions from student, parent, and teacher perspectives. It has high internal consistency, test-retest reliability, and interrater reliability (Reynolds & Kamphaus, 2004). Factor analysis and scale intercorrelations and correlations with other measures of behavior suggest strong validity

of the scale as well (Reynolds & Kamphaus, 2004). The BASC-2 was chosen over a more targeted measure of anxiety to determine if other areas of functioning were impacted through participation in the intervention. This measure enabled this pilot study to explore the intervention's impact on overall functioning while contributing to the limited research on test anxiety in elementary school children.

The BASC-2 was used to assess pre- and post-test levels of internalizing problems, externalizing problems, and adaptive skills. Specifically, anxiety, depression, sense of inadequacy, self-reliance, and self-esteem were measured on the BASC-2 Self-Report; anxiety, depression, internalizing problems, withdrawal, adaptability, social skills, leadership skills, and functional communication were measured on the BASC-2 teacher report; and anxiety, depression, and internalizing problems were measured on the BASC-2 parent report. On the clinical subscales of the BASC-2, a T score of 60-70 is considered at-risk and a score of 70 or above is considered clinically significant. On the adaptive scale of the BASC-2, a T score of 30-40 is considered at-risk and a score of 30 or below is considered clinically significant. The child self-report measure was administered individually within two weeks prior to the start of the intervention and post-tests were administered individually within one week after the completion of the intervention. Parents and teachers completed a BASC-2 about their child/student during both the pre- and post-test periods.

NEPSY-Second Edition: Inhibition Subtest. The NEPSY-Second Edition (NEPSY-II; Korkman, Kirk, & Kemp, 2007) is a quantitative neuropsychological assessment that examines executive functioning in children ages 3:0 through 16:11 years and is individually administered to each child by a qualified examiner (e.g., psychologist,

school psychologist, psychometrist). This test is designed to evaluate school-based concerns such as poor academic performance and behavioral control problems. The inhibition subtest was chosen as a pre-test and pos-test measure for this study. This subtest targets attention and executive functioning skills that are involved in self-regulation. Specifically, this subtest examines inhibitory control, which is the ability to resist the urge to engage in an enticing behavior, as well as the capacity to stop oneself from engaging in automatic thoughts and behaviors (Korkman et al., 2007). During this test, children were asked to look at a series of black and white shapes (circles and squares) or arrows (up and down) and name the shape or direction given certain rules related to the color of the shape (e.g., name the correct direction if the arrow is colored black but name the opposite direction if the arrow is colored white) (Korkman et al., 2007). Because the Test Stress Intervention involved, in part, learning and understanding cognitive behavioral techniques such as cognitive restructuring and stopping automatic anxious thoughts, the researchers were interested in examining executive functioning in the participants as they would be required to utilize these skills during the intervention. The reliability coefficients on the NEPSY-II for children aged eight years are .67 for IN Naming combined scaled score, .83 for IN Inhibition combined scaled score, and .85 for IN Switching combined scaled score. The reliability coefficients for children aged nine years are .93 for IN Naming combined scaled score, .89 for IN Inhibition combined scaled score, and .89 for IN Switching combined scaled score. Lastly, the reliability coefficients for children aged 10 years are .93 for IN Naming combined scaled score, .89 for IN Inhibition combined scaled score, and .89 for IN Switching combined scaled score.

Test-stress symptoms checklist. The test-stress symptoms checklist is a quantitative inventory designed by the primary researcher based on a brief test anxiety symptoms questionnaire developed by Casbarro (2005) in order to gather information about students' symptoms of test anxiety. The scale was expanded from 15 items to 41 items by adding additional examples of test anxiety symptoms that students might experience (Casbarro, 2005). Students were asked to consider each item (e.g., *I cannot relax before a test; sometimes I have negative thoughts about myself while working on an important test; worrying about a test makes it hard for me to sleep; test don't show how much I know*) and determine if it reflected their experiences with testing and test anxiety. They were instructed to place a check next to an item if it was consistent with their experience and leave items blank that were inconsistent with their experiences. This scale examined four main sources of test anxiety: (1) concerns about how others will view you if you do poorly, (2) concerns about your own self-image, (3) concerns about your future security, and (4) concerns about not being prepared for a test. The scale measured three main expressions of test anxiety: bodily reactions, thought disruptions, and general test anxiety symptoms. Student results were determined by calculating the total number of symptoms experienced.

Curriculum-based measure. Participants were asked to complete a mixed method curriculum-based measure during the pre- and post-assessment period. This measure included both qualitative free response questions and quantitative checklists specific to the Test Stress Intervention in order to examine students' knowledge about stress management strategies and test preparation methods. This tool also assessed participants' confidence in handling testing situations using a Likert scale. Specifically,

five free response questions, two Likert scale items, and 11 checklist items were included. Results were measured from pre- to post-test, with checklist items tallied for a total number. Free-response items were examined qualitatively using thematic analysis (Strauss & Corbin, 1998).

Facilitator and student evaluation forms. Group member and facilitator completed evaluation forms designed to measure the acceptability, integrity, and cultural modifications of the intervention. Acceptability information helped to determine the extent to which the stakeholders (i.e., the facilitators and the group participants) felt that the intervention was enjoyable, interesting, engaging, and beneficial to participants (Nastasi et al., 2004). Facilitator forms were completed following each session and included six free-response questions. Four questions addressed acceptability, asking facilitators to comment on their feelings about the process and outcome of the session, their own enjoyment of the content and their belief in the importance of that content for student learning, the extent to which students were interested and engaged in the session, and whether facilitators recommended changes to improve the intervention (see Appendix A for facilitator evaluation form). Students were required to complete an evaluation form following each session as well. These forms included ten questions, all of which addressed acceptability, including five free response and five 4-point Likert scale items. Across all questions on the scale, students were asked to share what they liked best and least about the intervention, what they learned during the session, how the session made them feel, whether the lesson was helpful to them, if they were willing to practice the skills they learned in the future, and if they would change anything about the session (see Appendix B for student evaluation form).

Integrity information was gathered by facilitators in order to determine if the intervention was implemented as planned (Gresham, Gansle, Noell, & Rosenblum, 1993) and included critical components, essential instructional elements of the intervention required for proper implementation (Nastasi, et al., 2004). Critical components within a session included key activities, lessons, and practice that were crucial to student learning and understanding of stress management and test taking skills. Facilitators completed integrity checklists for each session to record whether the critical components were addressed. Additionally, because the intervention was designed to be culturally and developmentally appropriate for participants (Nastasi et al., 2004), questions on the facilitator feedback forms addressed integrity by asking about the appropriateness of the intervention considering the age, gender, and ethnicities of the participants as well as facilitator recommendations for future intervention changes and improvements. Additionally, facilitator forms asked if modifications were included in the current session, and if so, how these changes addressed social and cultural factors relating to the participants (Nastasi et al., 2004; Power, Blom-Hoffman, Clarke, Riley-Tillman & Kelleher, 2005; Varjas et al., 2005). It is important to note that necessary modifications are not considered limiting to integrity, but rather enhancing the appropriateness of the intervention (Nastasi et al., 2004).

Test Stress Intervention Curriculum

The Test Stress Intervention curriculum (Tenenbaum, Cadenhead, Varjas, & Skillman, 2010) was developed for the targeted school and participants by incorporating research-based practices to reduce stress. Anxiety management interventions for school-aged children have successfully made use of a variety of different strategies, which

include cognitive-behavioral therapy (e.g., Bernstein et. Al, 2005; Wood, Piacentini, Southam-Gerow, Chu & Sigman, 2006), relaxation training (e.g., Cheek et al., 2002; Hampel, Meier, & Kummel, 2008), mindfulness, (e.g., Semple, Reid, & Miller, 2005), systematic desensitization (e.g., Egbochuku & Obodo, 2005), and problem solving (e.g., Pincus & Griedman, 2004; Romano, Miller, & Nordness, 1996). These intervention strategies, typically implemented with an adult population, have been modified to address the needs of children and adapted to their developmental level. Kingery et al. (2006) discussed the importance of modifying interventions to work appropriately with children's developmental and cultural needs, suggesting that adult interventions for anxiety, particularly CBT, can be effectively adapted to work with young children.

Modifications included in the current intervention involved shortening the length of specific strategies, including developmentally appropriate language when teaching lessons, providing multiple opportunities to model and practice skills, and incorporating creative activities, games, and art projects into the lessons (Nastasi, Moore, & Varjas, 2004). Specifically, a brief relaxation strategy was used that incorporating students' prior knowledge (i.e., "Stop, Drop, and Roll" strategy; see Table 8), longer relaxation strategies (i.e., progressive muscle relaxation, mindfulness body scan) were shortened and the language was modified to be developmentally appropriate. Movement activities, craft projects, and skills practice were featured in all sessions to make them novel and engaging. Additionally, frequent review of skills was included to ensure that students developed an understanding of concepts. Please see Table 8 for a summary of the intervention sessions.

Table 8. *Summary of Test Stress Intervention Sessions*

Session	Goals	Summary
1. Introduction and Rapport Building	To introduce group and its purpose. To establish rapport between students and group leaders.	Students generated agreed upon group rules and consequences and participated in a fun ice breaker game.
2. Progressive Muscle Relaxation	To learn and practice a new way to relax when anxious.	Students learned and practiced progressive muscle relaxation and created personalized squeeze stress balls.
3. Anxiety Hierarchy and Brief Relaxation	To generate personal awareness of anxiety causing situations and learn a new relaxation technique.	Students created an anxiety hierarchy and practiced a new relaxation technique called, *Stop, Drop, and Roll* (Cheek, 2002).
4. Anxiety in Our Bodies and Mindfulness Relaxation	To identify what anxiety feels like in the body and increase self-awareness of these feelings while relaxing.	Students discussed how anxiety feels in their bodies and practiced a mindfulness body scan to increase awareness of their bodies.
5. Anxiety and Our Thoughts	To identify and recognize unrealistic or unhelpful automatic thoughts that occur when students are anxious and to reevaluate these false perceptions.	Students identified their negative self-statements and practiced replacing those thoughts with more positive/realistic thoughts.
6. Test Taking Strategies and Study Skills	To review study skills, time management, and test taking strategies and to learn a new relaxation strategy.	Students learned different test taking strategies and study skills and practiced using them as a group. Students also learned and practice a new visualization strategy in which they imagined a peaceful place.
7. Building Confidence	To review previously learned skills, solidify knowledge of these skills, and build students' confidence in their abilities.	Students reviewed and practiced skills and completed a self-portrait highlighting their skills and strengths.
8. Review, Future Directions, and Celebration	To review skills learned, highlight competencies, and discuss skill maintenance.	Students applied their skills using an example test anxiety scenario. The group concluded

	Students will discuss ways to continue practicing these skills to reduce their stress.	with a celebration of the students and their accomplishments.

Data Analysis

Using the SPSS Version 18.0 computer analysis software, quantitative data were analyzed with paired-samples t-tests adjusted for multiple testing effects using the Bonferroni correction procedure. In this study, the paired-samples t-tests compared the means of variables for the same subjects over two time periods (i.e., pre-intervention and post-intervention) to determine if significant change had occurred from one time period to the next (Minium, Clarke, & Coladarci, 1999). A deductive-inductive process was used to analyze qualitative data in order to establish themes and interpret the feedback (Varjas et al., 2005). This process involved reviewing the literature (i.e., deductive) and the raw data (i.e., inductive) to identify themes in participant and facilitator responses (Nastasi, 2008). A deductive process was used to craft the feedback forms, ensuring that the questions addressed the concepts of acceptability and integrity reflected within the literature (i.e., Gresham, Gansle, Noell, & Rosenblum, 1993; Nastasi et al., 2004). Following the intervention, the feedback forms were examined both inductively and deductively by the primary researcher using a process consistent with established qualitative data analysis procedures based on Grounded Theory (e.g., Strauss & Corbin, 1998). During the process, the researcher identified themes relevant to the acceptability, integrity, cultural appropriateness, and efficacy of the intervention. The researcher established themes that were consistent with the literature and determined if new themes emerged based on the responses included within this data set. Following the initial coding process, themes were verified with a second researcher through discussion of the

identification and definition of theme categories. The process of reviewing the literature and the raw data to identify and develop themes continued until the research team reached consensus on a coding system.

Results

Acceptability

Group members and facilitators provided input relevant to intervention acceptability through the completion of post-session feedback forms. Acceptability examined facilitator and group participant perceptions of whether the intervention was enjoyable, interesting, engaging, and beneficial to participants (Nastasi et al., 2004). Group members discussed their perceptions about the content material, their likes and dislikes regarding the intervention, their suggestions for changes and improvements, and whether they would implement strategies outside of the intervention (i.e., in real life). Facilitators reported on their perceptions of the session as well, addressing the content and usefulness of the lesson, the appropriateness of the session for the students, whether the session would benefit the participants, and suggestions for change. Findings, analyzed using a deductive-inductive coding process (Varjas et al., 2005), are reported separately for students and facilitators.

Group members. Student participants provided feedback about their perceptions of the group experience by responding to 4-point Likert scale items and free response questions on their weekly feedback form. A review of Likert scale items indicated that over all eight sessions, 85% of participants agreed or strongly agreed that the content material was helpful to them, 95% of participants indicated that they were willing to practice what they learned in the future, 89% agreed or strongly agreed with the

statement that the sessions were interesting to them, 92% felt that other children would have enjoyed the group sessions, and 92% indicated that they were glad that they could participate in the group sessions. Because acceptability literature does not include information about percentages, integrity research was used as a benchmark to measure quantitative acceptability. Based on the integrity literature, which qualifies high integrity as over 80% (Gresham, Gansle, & Noell, 1993; Perepletchikova & Kazdin, 2005), this would suggest a high percentage of acceptability among student participants across sessions.

Student acceptability themes emerged through deductive-inductive analysis, a process that examined definitions of acceptability in the literature (deductive) and added new themes that emerged through data analysis (inductive) that may not have been represented in the literature. These themes included positive feelings about the session, the belief that strategies would be helpful, and the enjoyment of the sessions. Students consistently reported positive feelings, including feeling "happy," "good," or "relaxed" as a result of the sessions, which they often indicated were "fun." One student shared, "I feel better when I think of positive thoughts over negative ones." Students reported feelings of confidence following group sessions as well. For example, a student shared that she felt, "very confident and safe." Consistent with the quantitative data, many students reported that the strategies they learned were helpful to them. For example, a participant wrote about sessions five's lesson on positive self talk, stating that what she learned would "help me with my fears." Following session two, one child shared that he felt "good because in the future this will help." During session five, a participant wrote, "I learned

how to keep going when I am struggling." Another student wrote that she learned how, "not to worry about how I do on a test."

Participants also discussed what made sessions most enjoyable to them. It was consistently reported that sessions with hands-on or high movement activities were the most fun and interesting. Sessions with these types of activities were the most highly rated sessions by students on Likert scale questions. For example, session two, which involved learning progressive muscle relaxation and creating individualized stress balls using art materials, was endorsed by 100% of students as interesting and all students felt that other boys and girls would enjoy participating. Over all five Likert scale acceptability questions, session two achieved a 96.2% acceptability rating. Additionally, session five, which involved creating a self-portrait using art materials to reinforce a lesson focused on positive self-talk, was highly rated as all students reported that the session was interesting, others would have enjoyed the group, and they were glad that they could be a part of the session. An average of all questions revealed that students gave session five a 96.4% acceptability rating. Other sessions that were highly rated included session six (overall 90.6% acceptability) and session eight (overall 94.4% acceptability). Session six focused on learning test taking strategies and practicing deep breathing while visualizing a peaceful place. The skills practice component was supplemented with an artistic activity, allowing students to draw a representation of their peaceful place. Session eight included a review of stress management strategies and application of skill learned using an example test anxiety producing scenario. Skills practice was supplemented with fun activities like a stress management themed word-find and an active team building game that allowed for movement.

Students provided critical feedback related to acceptability to aid in future intervention improvements. Participants reported feelings less positive about their experience during sessions that involved fewer hands on activities. One student shared that she "learned how to control her stress" during session four, but "wish[ed] that there was a craft for stress." The lowest rated session overall was session three, with 73% of participants noting that they enjoyed participating and felt that the content of the session was helpful, 93% of participants endorsing the statement that they will practice what they learned in the future, 54% of participants indicating that the session was interesting to them, and 79% noting that other children would have enjoyed participating. This session involved reviewing a previously learned strategy and did not include an art activity, suggesting that incorporating novelty and hands-on activities were important factors in achieving participant acceptability of the intervention. Other less frequently reported critiques included the need for more time during the sessions, reported by two students, and the addition of male group participants, expressed by one male student.

Facilitators. Group facilitators provided feedback using free response forms following each session. Through qualitative deductive-inductive analysis, the following themes surrounding facilitator acceptability emerged: student participation and engagement, student interest and enjoyment, participant understanding of concepts, the helpfulness of concepts, and shared student learning. Facilitators consistently reported that they were pleased with sessions because "students were engaged and participating throughout the session." Facilitators commented on the nature of student participation, noting the importance of taking group sessions seriously. For example, a facilitator shared that she was pleased with the process of the session because the students "took the

relaxation activity seriously." Another facilitator shared that she felt the session went well because "all students participated and most felt comfortable sharing their experiences."

Facilitators noted that it was important for students to enjoy the sessions and be interested in the content in order for sessions to be acceptable. With regard to the first session, one facilitator wrote that the participants "responded to the activities with interest." Another facilitator shared that she felt the students accepted the session, stating: "They definitely enjoyed themselves! They were participating and definitely engaged." Feedback revealed that students particularly liked sessions that involved hands on activities as the avenue for learning a stress management technique. For example, one facilitator shared, "They all loved the stress ball making activity and having a permanent product to take with them." Another wrote, "They enjoyed the drawing and appeared to grasp the idea of being able to change their negative thoughts into positive ones." While most sessions involved these types of activities, facilitators suggested that even more could be incorporated in order to help with engagement and make the sessions more fun for the students. Facilitators reported increased acceptability when session modifications were made to the curriculum that increased the amount of hands-on activities. For example, one facilitator shared:

> The original plan was to talk about stress in the body before practicing the body scan, but we decided to have the students look at a large poster board image of a body and draw and write where they experience stress. This change made the activity more age appropriate and interactive, which I think the students enjoyed much more than they would have a seated discussion.

Facilitators believed that participant understanding of concepts was a key factor in the acceptability of the intervention. Facilitators overall felt that participants understood

the concepts and activities were developmentally appropriate. For example, one facilitator shared in her comments:

> I think the session was very appropriate. The kids understood the concepts, could get actively involved, and the body scan was in kid friendly language and was short enough to sustain most of their attention. Most students were able to share something about their bodies that they found out through the body scan that they didn't realize before.

Another facilitator stated:

> The muscle relaxation activity was shortened from the adult version and it used more child-friendly language. I think this adaptation of the activity made it within their developmental level. I think with continued practice, this should benefit students.

While facilitators believed that sessions were age appropriate and that the concepts taught were important for students, they reported concern about students' ability to internalize concepts and generalize information to anxiety producing situations. One facilitator stated that "students understood how to relax using progressive muscle relaxation, but I'm not sure how they will be able to generalize it and use it independently." Facilitators often reported that more time for discussion and practice would have enhanced student comprehension and increased their likelihood of using stress management concepts, thus making the experience more beneficial.

Facilitators commented on the importance of shared student learning as an essential learning tool for students and a significant element of an acceptable session. One facilitator stated, "students seemed to benefit from hearing feedback from others and that helped them share more." Another facilitator wrote that the group process "helped them realize that they are not the only ones feel nervous or anxious about test taking." A comment along similar lines stated, "I think it was interesting for students to see where everyone felt stress in their bodies and find out if they shared experiences with others. I

think this made them more aware of the stress they experienced in their bodies." Based on this qualitative feedback, shared learning experiences in the group intervention format reportedly enhanced the learning process for students.

Facilitator critiques of the intervention included suggestions for improving the session activities (i.e., increasing hands on and movement-based activities) to make them more engaging and acceptable for students. In addition to suggestions for session improvements, facilitators reported frustrations surrounding the logistics of working within a public school environment, which included time, space, and scheduling limitations. Facilitators reported that they felt the sessions were worthwhile to students as designed, but additional time would have enhanced their learning and ability to generalize strategies to different settings through more in-depth discussion and continued group practice. Facilitators also expressed frustration about space limitations. Because the intervention took place within a school environment, flexibility was required and the available spaces often had drawbacks (i.e., too small, loud, distracting). For example, one facilitator stated, "I wish we could have sat away from the table to give students more space to practice the relaxation activity, but that's all we could do with our space." Additionally, to accommodate teacher and administrator requests, intervention sessions were scheduled during elective activities, which was reportedly challenging because students often felt disappointed when they had to miss a fun activity (e.g., art, music, free play) in order to participate in the intervention.

Integrity

Facilitators provided information on intervention integrity by completing integrity checklists of the critical components for each intervention session to record whether all of

the goals of the session were met. Integrity information was gathered in order to determine if the intervention was implemented as planned (Gresham, Gansle, Noell, & Rosenblum, 1993) and included critical components (Nastasi, et al., 2004). Facilitator feedback forms provided qualitative information about cultural modifications to the intervention (Nastasi et al., 2004; Power, Blom-Hoffman, Clarke, Riley-Tillman & Kelleher, 2005; Varjas et al., 2005). As previously noted, modifications designed to improve the intervention are not considered limiting to integrity, but rather enhancing the cultural appropriateness and acceptability of the intervention (Nastasi et al., 2004).

Integrity checklist completed by all facilitators revealed that the critical components were met 100% of the time, suggesting high intervention integrity (Gresham, Gansle, & Noell, 1993; Perepletchikova & Kazdin, 2005). Facilitators reported on session modifications that were designed to enhance the acceptability and integrity of the intervention. On several occasions, visual and artistic tools were added to improve discussion and increase student engagement. For example, during a session involving the topic of stress in the body, an image of a body was incorporated as a model to facilitate discussion and help students visualize the "stress in our bodies" activity. Another modification involved the introduction activity. Each week, the group began with a check-in to incorporate routine and allow students to express their feelings as they entered the group session. The introduction activity was originally planned to have participants write down a happy thought and an anxiety provoking thought and share these with the group. Students reported that this activity was not enjoyable for them because it was too long and not hands-on enough. Additionally, students struggled to conceptualize a "worrying" thought and did not seem to like this element. As such, the

check-in activity was modified to allow students to briefly think about one happy thought and share it with the group. This modification enabled the continuation of the introduction activity in a way that was more engaging and acceptable to students.

Another adjustment was made to the order of the sessions. Originally the "Stop, Drop, and Roll" relaxation technique was planned for session three, but this strategy was introduced during the first session the groups met. The reason for this adjustment was due to the school schedule and a fast approaching national standardized assessment. Facilitators believed that it was important for students to learn this strategy during the first session so that they could have this tool in their toolbox to use during the upcoming exam. These modifications allowed the sessions to maintain the critical components but enhanced the content material so that it was more culturally and developmentally appropriate for the participants, thus increasing engagement and learning (Nastasi, Varjas, Bernstein, & Jayasena, 2000).

Efficacy

Quantitative analysis examined the amount of change in emotional adjustment and cognitive flexibility from pre-test to post-test on the BASC-2 parent, teacher, and student report, the NEPSY-II Inhibition subtest, the test stress symptoms checklist, and the curriculum-based measure to assess the effectiveness of the small-group counseling pilot intervention.

BASC-2 Self-Report. Paired-samples t-tests examining two-tailed hypotheses were conducted to determine change in the BASC-2 Self-Report items, which included Anxiety, Depression, Sense of Inadequacy, Self-Reliance, and Self-Esteem (see Table 9). All student participants completed the BASC-2 Self-Report scale during the pre-test and

Table 9. *Pre-Post Results for the Behavioral Assessment System for Children, Second Edition, Self-Report*

Variable	Pre-Test *M (SD)*	Post-Test *M (SD)*	*MD (SD)*	*t*(15)	*p*
Anxiety	52.88 (11.89)	51.94 (12.50)	.94 (4.92)	.762	.458
Depression	49.94 (11.48)	50.44 (10.54)	-.50 (5.16)	-.387	.704
Sense of Inadequacy	52.31 (11.89)	48.44 (9.54)	3.88 (5.51)	2.81	.013
Self-Reliance	47.31 (13.16)	52.19 (12.80)	-4.88 (6.57)	-2.97	.010
Self-Esteem	48.56 (12.80)	48.81 (15.60)	-.25 (8.66)	-.12	.910

Note. All mean values are scaled scores; *MD* = mean difference between pretest and posttest.
*Indicates significance at the .002 level after controlling for the effects of multiple testing.

post-test period (n = 16). Using the Bonferroni adjusted alpha level of .002 (.05/21), statistically significant change was not found for Sense of Inadequacy $t(15) = .281$, $p = .013$ ($p > .002$), Self-Reliance $t(15) = -.297$, $p = .010$ ($p > .002$), Anxiety $t(15) = .762$, $p = .458$ ($p > .002$), Depression $t(15) = -.387$, $p = .704$ ($p > .002$), or Self-Esteem $t(15) = -.12$, $p = .91$ ($p > .002$).

BASC-2 Teacher Report. Paired-samples t-tests examining two-tailed hypotheses were conducted to determine teacher reported change in the BASC-2 Teacher Report items, which included Anxiety, Depression, Internalizing Problems, Withdrawal, Social Skills, Leadership Skills, and Functional Communication (see Table 10). All teacher participants completed a BASC-2 teacher report during the pre- and post-assessment period for each participating student in their class (n = 16). Using the

Table 10. *Pre-Post Results for the Behavioral Assessment System for Children, Second Edition, Teacher-Report*

Variable	Pre-Test *M (SD)*	Post-Test *M (SD)*	*MD (SD)*	*t*(15)	*p*
Anxiety	65.63 (9.99)	62.00 (7.41)	3.63 (6.29)	2.31	.036
Depression	60.63 (11.31)	57.75 (10.67)	2.88 (5.40)	2.13	.050
Internalizing Problems	63.19 (10.30)	59.13 (8.15)	4.06 (7.26)	2.24	.041
Withdrawal	54.75 (7.61)	51.50 (7.90)	3.25 (5.77)	2.25	.040
Adaptability	42.44 (5.85)	46.44 (6.20)	-4.00 (5.01)	-3.20	.006
Social Skills	46.44 (7.16)	49.75 (7.81)	-3.31 (4.67)	-2.84	.013
Leadership Skills	46.88 (5.95)	50.88 (6.82)	-4.00 (4.38)	-3.65	.002*
Functional Communication	46.81 (5.96)	51.00 (6.85)	-4.19 (5.58)	-3.00	.009

Note. All mean values are scaled scores; *MD* = mean difference between pretest and posttest.
*Indicates significance at the .002 level after controlling for the effects of multiple testing using the Bonferroni procedure (.05/21).

Bonferroni adjusted alpha level of .002 (.05/21), a statistically significant increase was found in Leadership Skill $t(15) = .002$ ($p \leq .002$). No significant changes were found for the pre- to post-test period for Anxiety $t(15) = .036$ ($p > .002$), Depression $t(15) = .050$ ($p > .002$), Internalizing Problems $t(15) = .041$ ($p > .002$), Withdrawal $t(15) = .040$ ($p > .002$), or Social Skills $t(15) = .013$ ($p > .002$). Results approached significance on

measures of Adaptability $t(15) = .006$ ($p > .002$) and Functional Communication $t(15) = .009$ ($p > .002$).

BASC-2 Parent Report. Paired-samples t-tests examining two-tailed hypotheses were conducted to determine parent reported change in the BASC-2 items of Anxiety, Depression, and Internalizing Problems (see Table 11). Two parents did not complete the pre-test assessment and one parent did not complete the post-test assessment ($n = 13$). Using the Bonferroni adjusted alpha level of .002 (.05/21), there were no significant changes from pre- to post-test for any of these variables (Anxiety $t(12) = .305$ ($p > .002$); Depression $t(12) = .501$ ($p > .002$); Internalizing Problems $t(12) = .147$ ($p > .002$).

NEPSY-II Inhibition. Paired-samples t-tests examining two-tailed hypotheses were conducted to determine pre- to post-test change in the performance on the Inhibition subtest of the NEPSY-II, which included Naming, Inhibition, and Switching (see Table 12). All student participants completed the NEPSY-II Inhibition subtest during the pre- and post-assessment period ($n = 16$). Using the Bonferroni adjusted alpha level of .002 (.05/21), results revealed an increase that approached significance in performance on the Combined Scaled Score of the Switching subtest $t(15) = .005$ ($p > .002$). No significant changes were obtained for the Naming subtest $t(15) = .751$ ($p > .002$) or Inhibition subtest $t(15) = .586$ ($p > .002$) following the intervention.

Test stress symptoms checklist. A reliability analysis of the test stress symptoms checklist revealed a Chronbach's α of .79, which is considered an acceptable value, suggesting that this is a reliable scale (Kline, 1999). Paired-samples t-tests examining two-tailed hypotheses were conducted to determine change in student reported symptoms of test anxiety from pre- to post-intervention (see Table 13). All student participants

Table 11. *Pre-Post Results for the Behavioral Assessment System for Children, Second Edition, Parent-Report*

Variable	Pre-Test *M (SD)*	Post-Test *M (SD)*	*MD (SD)*	*t*(12)	*p*
Anxiety	54.92 (12.34)	52.62 (9.79)	2.31 (7.77)	1.07	.305
Depression	57.85 (15.54)	56.54 (13.56)	1.31 (6.80)	.69	.501
Internalizing Problems	57.38 (14.56)	53.38 (10.47)	4.00 (9.31)	1.55	.147

Note. All mean values are scaled scores; *MD* = mean difference between pretest and posttest.
*Indicates significance at the .002 level after controlling for the effects of multiple testing using the Bonferroni procedure (.05/21).

Table 12. *Pre-Post Results from the NEPSY-II*

Variable	Pre-Test *M (SD)*	Post-Test *M (SD)*	*MD (SD)*	*t*(15)	*p*
NEPSY-II Naming	9.94 (3.34)	10.34 (3.77)	-.44 (5.40)	-.32	.751
NEPSY-II Inhibition	10.19 (2.59)	10.63 (3.24)	-.44 (3.14)	-.56	.586
NEPSY-II Switching	9.94 (3.23)	12.56 (2.58)	-2.63 (3.20)	-3.28	.005

Note. All mean values are the combined scaled scores; *MD* = mean difference between pretest and posttest.
*Indicates significance at the .002 level after controlling for the effects of multiple testing using the Bonferroni procedure (.05/21).

Table 13. *Pre-Post Results from the Test Stress Symptoms Checklist, and Curriculum-Based Measure (CBM)*

Variable	Pre-Test *M (SD)*	Post-Test *M (SD)*	*MD (SD)*	*t*(15)	*p*
Test Stress Symptoms Checklist	23.69 (6.41)	23.19 (10.70)	.50 (7.55)	.27	.795
CBM: Worry	1.63 (.50)	1.13 (.34)	.50 (.52)	3.87	.002*
CBM: Confidence	2.06 (.68)	2.50 (.52)	-.44 (.63)	-2.78	.014
CBM: Coping Strategies	4.06 (2.21)	7.63 (2.83)	-3.56 (2.22)	-6.42	.000*

Note. All mean values are raw scores; *MD* = mean difference between pretest and posttest.
*Indicates significance at the .002 level after controlling for the effects of multiple testing using the Bonferroni procedure (.05/21).

completed the test stress symptoms checklist before and after the intervention period (n = 16). Using the Bonferroni adjusted alpha level of .002 (.05/21), results did not reveal statistically significant change in self-reported symptoms of test anxiety $t(15) = .795$ ($p > .002$).

Curriculum-based measure. Paired-samples t-tests examining two-tailed hypotheses and qualitative analysis were conducted to determine whether students reported changes in their feelings about testing and their knowledge of strategies that they can use to handle test anxiety (see Table 13). All students completed this measure during the pre-test and post-test period (n = 16). Paired-samples t-tests using the Bonferroni adjusted alpha level of .002 (.05/21), revealed that students were significantly more likely to report that they knew what to do when worried about a test $t(15) = .002$ ($p \leq .002$) and they were more aware of different stress reduction and test-taking strategies that they

could use when faced with a test and test anxiety $t(15) = .000$ ($p < .002$). Qualitative analysis revealed that students had an increased knowledge about different ways to calm down when anxious (e.g., "I can think of a peaceful place." "I can change negative thoughts to good ones."), how to use deep breathing and muscle relaxation (e.g., "I can relax by breathing slow and quiet breaths"), and had a large repertoire of strategies that they could pull from independently when faced with a stressful testing situation. Statistically significant increases in students' confidence in handling testing situations were not found $t(15) = .014$ ($p > .002$).

Discussion

This pilot intervention contributes to the limited literature examining school-based interventions designed to address test anxiety in elementary-aged children by offering promising findings about the acceptability, integrity, and efficacy of a school-based test anxiety reduction intervention. Much of the intervention research addressing childhood anxiety has been conducted in clinic-based settings with children experiencing diagnosed anxiety disorders (e.g., Kendall et al., 2008; Waters et al., 2008). Research suggests that test anxiety is a growing phenomenon (Kruger, et al., 2007; McDonald, 2001; Putwain, 2009a) and prevention and intervention efforts in school-settings are an important way to address this area of concerns (Weems et al., 2010). The current study addressed third grade students' experiences of test anxiety specifically and intervened within a school-setting, providing researchers and practitioners with a model to help them implement similar successful interventions in elementary schools.

The current study provided early intervention services to third grade children during a time of increased school-based testing, while the majority of interventions on

test anxiety address the concerns of older children in high school or college (e.g., Deukstar, 2008; Gregor, 2005). Research has suggested that test anxiety may be more prevalent in younger children than older children (Li & Chung, 2009) and test anxiety begins to develop during the elementary school years (Hembree, 1988; Kruger, et al., 2007). While intervention services for older students who are experiencing increased test anxiety will remain important, the current intervention addressed test anxiety at the elementary level, thus providing Tier II level services, consistent with the Response to Intervention (RTI) model (Vaugn & Bos, 2009) at the prevention/early intervention stage. Research suggests that early interventions can be effective in reducing childhood anxiety (Hirschfeld-Becker, et al., 2010) and test anxiety (Cheek et al., 2002), and this study offers much needed information about the implementation of early services to address test anxiety in schools.

Another unique contribution that this study offers to the literature was the use of mixed methodology (Teddlie & Tashakkori, 2009) to analyze the process, content, and outcomes of this pilot intervention. The use of mixed methods serves to enhance data analysis and interpretation by providing a greater breadth and depth of information to address research questions more effectively and thoroughly (Collins & O'Cathain, 2009; Teddlie & Tashakkori, 2009). In the current study, the use of mixed methods allowed researchers to examine quantifiable pre- post-test data and connect that data with qualitative self-reports and observations. Qualitative data facilitated explanations for quantitative findings, thus helping researchers to interpret the results (Onwuegbuzie & Leech, 2004). For example, facilitators and students discussed the desire for more intervention time and the need for increased efforts to generalize content in order to

enhance student outcomes. This qualitative feedback helped researchers understand potential intervention limitations (e.g., time limitations) that may have impacted quantitative pre-post findings (e.g., no statistically significant reductions in student anxiety).

Gathering both quantitative and qualitative information to measure acceptability and integrity helped enhance the interpretation of intervention results, enabling researchers to understand them more holistically due to triangulation of multiple data sources (e.g., Powell, Mihala, Onwuegbuzie, Sudo, & Daley, 2008; Teddlie & Tashakkori, 2009). For example, the mix of qualitative and quantitative data helped researchers recognize what made certain sessions less acceptable to students (e.g., session three received lower Likert scale acceptability ratings and qualitative responses highlighted that this was due to the session's primary focus on discussion and its lack of novel activities) and offered valuable information to aid in future intervention improvements. The use of mixed methodology (Teddlie & Tashakkori, 2009) supported a greater understanding of the phenomenon of test anxiety and it is recommended that a mixed methods approach be used in future test anxiety intervention studies in order to obtain more meaningful results, which will support continued growth and development in this field of research.

Efficacy outcomes for participants of this intervention revealed several meaningful and significant findings. It was predicted that the intervention would increase students' awareness and use of stress management strategies, which was confirmed by significant results on the curriculum-based measure. This finding was consistent with previous research suggesting that children can effectively learn and practice test taking

and stress management strategies (e.g., Beauchemin et al., 2008; Beidel et al., 1999; Gregor, 2005). Students reported a greater knowledge about test anxiety reduction strategies, a willingness to continue practicing these strategies, and a stronger belief in their ability to handle difficult testing situations following participation in this intervention. Participants' written feedback further supported quantitative findings, as students were able to describe and explain how and when to use stress management and test taking strategies. This discovery suggested that this pilot intervention was effective in significantly increasing student knowledge and skill necessary to handle test anxiety.

This study also found that following participation in the intervention, students experienced increases in cognitive flexibility and inhibition of automatic thoughts. It was hypothesized that student training in cognitive behavioral strategies that involved cognitive restructuring and inhibition of automatic thoughts (Beck, 1970; Clark & Beck, 2010; Fall et al., 2004) would be reflected on the NEPSY-II Inhibition subtest, which examines similar processes (Korkman et al., 2007). Quantitative results on the NEPSY-II Inhibition subtest revealed no significance changes on the Naming and Inhibition portions of the test, but an increase in performance on the Switching portion of the test that approached significance. The Switching task involved inhibiting the automatic desire to name a pictured shape (circle/square) or direction (up/down) and instead naming the opposite shape or direction depending on the color of the shape (i.e., name the correct direction if the arrow is colored black but name the opposite direction if the arrow is colored white) (Korkman et al., 2007). It is possible that practice in the cognitive behavioral strategies of positive self-talk and cognitive restructuring increased students' proficiency on this task of cognitive control and flexibility (Fall et al., 2007; Kendall et

al., 2008). Qualitative data confirmed that participants grasped the concept of positive self-talk, with several students reporting that replacing negative thoughts with positive ones was a strategy that they felt would help them manage their anxiety. Previous studies have not examined the influence of cognitive behavioral therapy on executive functioning in third grade students experiencing test anxiety, making this a unique contribution to the literature base. Future researchers may wish to explore this area in more depth by examining links between test anxiety, cognitive behavioral anxiety reduction strategies, and executive functioning.

Despite statistically significant advances in student knowledge and trend level increases in cognitive flexibility, participants did not report a reduction in anxiety or test anxiety symptoms, in contrast to previous studies (e.g., Bernstein et al., 2008; Cheek et al., 2002, Kendall et al., 2008). There were several reasons why the results of this study may have been different from previous research. First, much of the literature on early intervention has addressed anxiety reduction in general (e.g., Kendall et al., 2008; Waters et al., 2008) rather than test anxiety reduction, and focused on participants with high levels of anxiety or diagnosed anxiety disorders. The current sample was referred by teachers as experiencing notable test anxiety, however, most of the participants self-reported general anxiety on the BASC-2 Self-Report to be within the normal range at pre-test. Additionally, none of the participants had a clinical diagnosis of an anxiety disorder from a doctor, psychologist, or psychiatrist. Because participants of this study experienced lower levels of anxiety than clinical samples (Reynolds & Kamphaus, 2004), it may have been difficult to measure statistical change on a general measure of social and emotional behavior in children. A more specific assessment tool that examines test

anxiety in elementary aged children may have been more appropriate, however, the availability of assessment tools that examine test anxiety in elementary children with recently validated norms is limited (McDonald, 2001). It is also important to note that the current study included a small sample size (16 participants), which may have limited the statistical power during data analysis. It is possible that a broad measure of social and emotional adjustment would be able to detect change more effectively with a larger sample of participants.

Another possible explanation for why symptoms of anxiety were not significantly reduced in participants could be due to insufficient duration or intensity of the intervention, as research suggests that higher intervention dosage can enhance outcomes (Rosenblatt & Elias, 2008; Zhai, Raver, Jones, Li-Grining, Pressler, & Gao, 2010). Many previously successful interventions took place over several months (e.g., Kendall et al., 2008; Manassis et al., 2002; Waters et al., 2008) and often included a parent training component (Bernstein et al., 2008),whereas the current study intervened with children only and occurred over a six week duration with sessions lasting approximately 30 minutes. Qualitative findings of the current study revealed that facilitators expressed a desire for additional time to allow students to fully understand and learn how to adequately apply concepts. While challenges associated with conducting school-based research (i.e., busy student class schedules, limited space availability, teacher and administrator preferences) limited the current study to the available time frame, it may be helpful for future researchers and interventionists to implement group interventions over a longer period of time (i.e., two to three months) and conduct sessions of greater duration. Facilitators in the current study also reported concerns about generalizability of

knowledge obtained during the intervention experience. Facilitators shared that while they believed students frequently understood concepts during the session, they were unsure as to whether students had enough practice or training to translate the use of these skills into their daily lives at school and at home. To aid in students' ability to generalize their learning to other environments, it will be helpful for future research to involve parents and teachers in the intervention process in order to reinforce student learning.

Parents also did not report significantly reduced anxiety in their children, nor did they find reductions in depression or internalizing problems. The lack of significant findings on parent reports may be due to several factors. First, limited parent involvement in the intervention process could have negatively impacted translation of skills from the school environment to the home. Parents received information packets at the start of the intervention and were welcomed to communicate with the first author and school counselor throughout the intervention at any time, but parents were not formally incorporated into the intervention itself. Previous research that reported significant changes in student test anxiety often included a parent component (e.g., Bernstein et al., 2008), suggesting that future researchers should incorporate this element into the intervention process. Second, the test stress intervention addressed students' struggles with anxiety surrounding performance- and test-focused situations, which may not occur in the home environment. While these experiences can take place in a variety of settings and situations (e.g., school plays, sporting events, classroom tests), performance-based evaluations are more prevalent in the school setting than at home. Given that test anxiety is a form of *state anxiety* (Abu-Rabia, 2004) occurring only in specific anxiety producing situations, rather than all the time (*trait anxiety*), it is possible that students exhibited

fewer internalizing symptoms in the home. This may have contributed to the lack of parent findings as it may have been difficult for them to observe significant changes in internalizing problems. Finally, three parents were unable to complete either the pre-test or the post-test BASC-2 measure, which impacted the sample size and may have compromised the statistical analysis. It will be important for researchers and practitioners to incorporate a parent component into future test anxiety interventions in order to encourage greater family interest and involvement and to increase parent participation both in the intervention and data gathering processes (Nastasi et al., 2004).

While teachers did not report statistically significant reductions in anxiety, they did report significantly increased Leadership Skills on the BASC-2, which measures the skills associated with accomplishing academic, social, or community goals, including the ability to work with others (Reynold & Kamphaus, 2004). This finding may be associated with students' increased knowledge and belief in their abilities to handle challenging testing situations, as the Leadership Skills scale includes the following items: *works well under pressure*; *gives good suggestions for solving problems*; and, *makes decisions easily*. It was interesting that while students and teachers both noted some gains in self-efficacy on the BASC-2 and skill-level confidence on the Curriculum Based Measure, students did not report significant growth in their self-esteem on the BASC-2 or overall confidence in their abilities to handle a test on the Curriculum Based Measure. This, again, may be due to the brief duration (i.e., six weeks) of the intervention (Rosenblatt & Elias, 2008; Zhai, Raver, Jones, Li-Grining, Pressler, & Gao, 2010), which may have limited its effectiveness. It is possible that with sustained practice and support from

parents and teachers, students' burgeoning self-confidence in their abilities would have continued to grow and could have led to a reduction in test anxiety.

This study provides information on the acceptability and integrity of the pilot intervention. Researchers (Eckert & Hintze, 2000; Leff, Hoffman, & Gullan, 2009; Nastasi, Moore, & Varjas, 2004) have proposed that examining acceptability and integrity is as important as studying efficacy outcomes when conducting intervention research. In fact, conceptual models of acceptability link these three factors reciprocally, suggesting that acceptability, integrity, and efficacy can mutually influence and improve one another (Eckert & Hintze, 2000; Witt & Elliott, 1985). Achieving intervention acceptability can serve to enhance both the implementation as well as the efficacy of the intervention (Eckert & Hintze, 2000). That is, if stakeholders are more accepting of an intervention, it is more likely to be implemented effectively, participants may take a more active role in the intervention, practice intervention strategies, and experience more positive efficacy outcomes (Eckert & Hintze, 2000). Integrity is an essential component of implementing an effective intervention as well (Leff et al., 2009). It helps illuminate intervention results to determine if outcomes were due to a weak intervention or poor implementation, and can provide information about the feasibility of an intervention itself (Gullan, Feinberg, Freedman, Jawad, & Leff, 2009; Leff et al., 2009). Interventions implemented with high integrity generally produce the most robust findings (Bellg et al., 2004). In the current study, results revealed that the intervention was implemented with high integrity (Gresham, Gansle, & Noell, 1993; Perepletchikova & Kazdin, 2005) and participants and facilitators found it to be acceptable. While limitations to acceptability were noted, the findings of this research supported the fact that a school-based

intervention to address test anxiety can be acceptable to third grade students and can be implemented with integrity, demonstrating the feasibility of this type of intervention for future researchers and practitioners.

Limitations and Future Directions

This pilot study was designed to explore the acceptability, integrity, and efficacy of a small group intervention and provide information for researchers and school-practitioners to use eand expand upon in future implementation. While this research provided valuable information for future directions, results cannot be generalized due to the small sample of participants, the fact that the intervention occurred in two public schools within a southeastern urban school district, and the non-experimental design of the study. However, the purpose of the current study was not to generalize results at this time, but rather to obtain information in an area of limited study (i.e., test anxiety interventions for elementary school children) in order to further the research in the field (Onwuegbuzie & Leech, 2007). Due to the promising results obtained from this pilot study, future researchers are encouraged to replicate this intervention with a larger sample of elementary school students in a variety of grades (first through fifth) and types of school settings (i.e., urban, suburban, rural), using an experimental or quasi experimental design that incorporates a comparison group in the form of a control group or a wait-list control group.

Researchers should consider implementing the intervention over a longer duration (Rosenblatt & Elias, 2008; Zhai, Raver, Jones, Li-Grining, Pressler, & Gao, 2010) using test anxiety specific measures to enhance the efficacy and improve the measurement of results. Increasing intervention duration would allow for additional skills training and

practice in varied situations, giving students opportunities to witness the effectiveness of strategies that they have learned and potentially enhancing their confidence and self-efficacy in their own ability to handle test anxiety. While the current study measured student confidence and feelings of test anxiety before and after the intervention period, it may also be beneficial for future researchers to evaluate students immediately following a testing situation like a standardized assessment. Examining student perceptions after an evaluative situation could yield valuable information about students' feelings of test anxiety and obtain a greater understanding of their use of test anxiety strategies during a real life experience. To help ensure that the intervention is acceptable to participants and culturally appropriate for elementary-aged children, fun and active lessons with craft projects or high movement games should be included in all intervention sessions. Additionally, future researchers should consider developing a commercially available norm referenced test anxiety scale for elementary aged children to allow for more accurate assessment of this phenomenon (Wren & Benson, 2004). Continued research will be essential in order to expand upon the current study's findings, further the development of research-based interventions to address test anxiety, and continue to provide effective school-based services to young children who are experiencing test anxiety.

Feedback from facilitators highlighted additional potential areas of limitation within the current study, including concerns about students' ability to adequately learn, understand, and generalize skills within the brief time frame available to implement the intervention. Facilitators also expressed frustration regarding challenges surrounding scheduling time to work with students and finding appropriate facilities to adequately

implement the intervention program. As researchers and practitioners, it is essential to recognize that common school-based challenges like these are part and parcel of service provision in the schools (e.g., Suldo, Friedrich, & Michalowski, 2010). Rather than viewing these factors as limitations or barriers to service provision, it will be important for future researchers and practitioners to recognize them as a component of the school ecology and devise interventions that can work effectively within the school culture and system (Nastasi et al., 2004). This can be done by examining the potential challenges within the school system prior to the development and implementation of an intervention and building a plan to address these factors proactively as well as actively involving stakeholders (i.e., students, teachers, parents, and administrators) in the intervention development and implementation process (Nastasi et al., 2004). Because school-based intervention is often the primary way in which children will receive necessary services for mental health concerns (Ivert et al., 2011; Weems et al., 2010), it is imperative that researchers and practitioners continue to implement test anxiety interventions within the school setting and remain flexible in order to work within the school parameters.

To address the challenges surrounding time and intensity limitations reported by facilitators, it may be helpful for future researchers and practitioners to run sessions for 45 minutes to one hour, rather than 30 minutes, to allow for transition in between classes and increased time for student learning. If additional time is not available, incorporating several extra sessions could allow for increased learning time. Another suggestion for future research is to include a parent and teacher component of the intervention to increase opportunities for practice and improve skill generalization. Parents can be involved through shared homework assignments and practice, as well as weekly update

letters or phone calls home from group facilitators. Adding information sessions for parents is another method to increase home-school collaboration. Teachers can take part in the effort to reduce test anxiety as well. It is recommended that researchers and school-based mental health practitioners collaborate with teachers to offer training, provide support for in-class services, and encourage teachers to teach and practice strategies to reduce test anxiety in their classroom. With greater school and community involvement in the effort to help students reduce test anxiety, children will have more opportunities to learn and practice the skills necessary to successfully address test anxiety.

Implications for Practice

Because test anxiety affects millions of school-children within the U.S. (Nottelman & Hill, 1977; Turner et al., 1993) and negatively impact their mental health (e.g., Barksdale-Ladd & Thomas, 2000; Locker & Cropley, 2004) and academic success (e.g., Cassady, 2004a; Putwain, 2010), intervening in order to provide children with coping strategies to face test anxiety and reduce their feelings of anxiety is an area of concern for school mental health practitioners (Kruger et al., 2007; McDonald, 2001). As the school-based experts in the mental health field, it is essential that school psychologists and school counselors spearhead the effort in schools to reduce test anxiety (Kruger et al., 2007; Shriber, 2007). School-based mental health practitioners can lead the way by offering school-wide, classroom-wide, small group, and individualized intervention and prevention services to address test anxiety (Kruger et al., 2007). Additionally, school-based mental health professionals should encourage increased community involvement by providing resources, information, and suggestions about how to help for families, teachers, and other school personnel (Kruger, et al., 2007). Through

collaborative efforts, school psychologists and counselors are in a position to support their school community by helping to provide necessary services for elementary children to address the growing concern of test anxiety in the current test-focused academic climate (Kruger et al., 2007).

The current study supports the fact that early intervention can effectively lead to increased knowledge and use of stress management and test taking skills in young children and may foster the development of student self-efficacy in handling and facing the performance-based evaluative situation that they will encounter throughout their academic and professional careers. This promising study has provided a starting point for the continued research and development of school-based interventions for elementary children experiencing test anxiety. Considering the RTI model within public schools (Vaughn & Bos, 2009), this more targeted, tier II level intervention demonstrates that early intervention/prevention services to address test anxiety can be successfully delivered and would be beneficial to students as part of the school-wide RTI effort to provide academic and social-emotional interventions to children at the elementary level.

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APPENDIXES

APPENDIX A

Facilitator Evaluation Form

1. To what extent were you pleased with the process and the outcome of today's session? Give reasons.

2. Did you enjoy the content of the session and feel that it will benefit the student participants? Explain.

3. To what extent did the students accept (e.g., like/enjoy, participate, show interest and engagement, learn from) today's session? Give examples.

4. Considering the age, gender, and ethnicities of the group members, to what degree was this session appropriate?

5. What would you change about today's session? Why?

6. Did you make any changes to the curricula more appropriate for the age, gender, and ethnicities of your group members? If so, what?

APPENDIX B

Student Evaluation Form

What did you learn today?

What did you like best about today's group?

What would you change about today's group?

What I learned today is/will be helpful to me. (Circle Your Answer)

Strongly Agree Agree Disagree Strongly Disagree

I am willing to try practicing what I learned today in the future. (Circle Your Answer)

Strongly Agree Agree Disagree Strongly Disagree

Today's group was interesting to me. (Circle Your Answer)

Strongly Agree Agree Disagree Strongly Disagree

Other boys/girls would have liked today's group. (Circle Your Answer)

Strongly Agree Agree Disagree Strongly Disagree

I am glad I could participate in group today. (Circle Your Answer)

Strongly Agree Agree Disagree Strongly Disagree

Today's group made me feel…

Why?