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The Impact of Relaxation Techniques on Third Grade Students' Self-Perceived Levels of Test Anxiety

Paper based on a program presented at the 2009 American Counseling Association Annual Conference and Exposition, March 19-23, Charlotte, North Carolina.

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Anxiety is a phenomenon that human beings routinely encounter within their daily experience. It is considered to be one of the most prevalent and pervasive human emotions, with a large sector of the world's population suffering from excessive and overbearing levels. Anxiety can be described as a perceived notion of psychological distress which occurs due to the expectation of a disconcerting and potentially threatening event. Although extensive research has focused on the concept of anxiety, it cannot be defined by purely objective or concrete means (Rachman, 2004). As a result of the ubiquitous nature of anxiety, the construct has been defined as different subtypes (e.g., social anxiety, state-trait anxiety). The focus of the present study was on one other such subtype, namely, test anxiety.

Within the American education system, the prevalence and significance of standardized testing has been increasing along with the stakes of this testing format (Black, 2005). As a result, today's students are associating a greater sense of consequence with the prospect of being tested, resulting in feelings of pressure to perform and fear of not performing adequately. According to Zbornik (as cited in Black, 2005), students who suffer from test anxiety tend to be consumed with feelings of anxiousness, worthlessness, and/or absolute dread in regard to their academic achievement. Test anxiety can produce a physiological hyper-arousal, interfering with students' mental processes and debilitating their ability to function during a test, as well as in the days and weeks leading up to a test (Soffer, 2008). Due to the pressure to perform and perceived importance of high-stakes testing, students' mental states and sense of emotional stability have become impaired. Rather than feeling confident about high-stakes tests and the higher level thinking they require, test-anxious students may become overly concerned with the repercussions of failure (Spielberger & Vagg, 1995). In addition to the adverse effects on cognitive processes, anxiety can produce physiological hyper-arousal, negative emotional responses, as well as behavioral problems in children.

Physiological arousal is defined by the *American Psychological Association Dictionary of Psychology* as aspects of arousal shown by physiological responses, such as increases in blood pressure and rate of respiration and decreased activity of the gastrointestinal system (Vandenbos, 2007). Other physiological effects of test anxiety include constricted blood vessels, raised body temperature, increased dilation of the eyes, muscle spasms, increased blood flow to muscles, and decreased blood flow to the skin (Zeidner, 1998). The Educational Testing Service (ETS) and Praxis add nausea, muscular cramps, faintness, and dry mouth to the list of physiological symptoms as a result of test anxiety (Educational Testing Service, 2005).

Emotionality is a link between the cognitive affects of test anxiety and the physiological effects. Zeidner (1998) defined emotionality as the attention paid to, and interpretations of, affective/physiological arousal. Thus, two students who are overcome by the same physiological symptoms of test anxiety may have different levels of anxiety based on their differing awareness of physiological changes and bodily arousal. Triplett and Barksdale (2005) identified specific symptoms of emotionality in a study measuring levels of test anxiety, including feelings of hate, anger, nervousness, boredom, confusion, and frustration. Cheek, Bradley, Reynolds, and Coy (2002) found, from teachers' reports, that following testing, some children exhibited several behavioral problems such as avoidance, crying, illness, and outburst of anger.

Test Anxiety and Relaxation Training

Various forms of relaxation training have been used to mitigate the deleterious effects of anxiety. Two particular techniques, deep breathing and muscle relaxation, have been shown to effectively decrease anxiety levels in individuals who have difficulty relaxing in anxious situations (Zuercher-White, 1998). These techniques can result in individuals' increased focus on the task at hand rather than on their level of anxiety.

Deep breathing can be defined as slow, diaphragmatic breathing that balances out the oxygen and carbon dioxide levels in the body (Nassau, 2007). While utilizing

diaphragmatic breathing, it is important that air is inhaled through the nose and exhaled through the mouth. In response to this sensation, the body will react with less severe symptoms in a time of high anxiety or panic (Zuercher-White, 1998). The author recommended that when training individuals how to utilize this technique, inform them of the purpose of this training and what the outcome of the techniques will be. A longitudinal study conducted over 2 years with 64 post-baccalaureate premedical students investigated perceived experience of test anxiety (Paul, Elam, & Verhulst, 2007). The students were taught to utilize deep breathing techniques to reduce their anxious feelings. The students' self-reports after the intervention indicated that they felt less test anxiety, nervousness, and self-doubt.

Progressive muscle relaxation is a process that involves decreasing the physiological aspects of anxiety while distracting the individual from their awareness of anxious feelings (Nassau, 2007). The progressive muscle relaxation technique consists of a sequential tensing and relaxing of different muscle groups. The individual progresses through the major muscle groups in the body, usually progressing from the head and neck muscles to the legs and ankles or *visa versa*.

Zaichkowsky and Zaichkowsky (1984) found that even 4th-grade children can learn stress control in a short period of 6 weeks. Children were taught progressive muscle and imagery-based techniques to control physiological arousal (i.e., heart rate, respiration, and skin temperature). The authors found decreases in all three of the children's physiological responses to anxiety. Rasid and Parish (1998) conducted a study examining the effects of two types of relaxation training with 55 high school students' levels of anxiety using an experimental-control group design. Results showed that both behavioral relaxation and progressive muscle relaxation techniques produced significantly lower anxiety scores in the experimental group as compared to the control group. In a more recent study, Lohaus and Klein-Hessling (2003), utilized progressive muscle relaxation in an effort to reduce text anxiety in 160 fourth- and sixth-grade students. They found that relaxation techniques can have a more significant calming effect in children over the short-term (i.e., five sessions) as compared to additional training sessions (i.e., ten sessions). These results suggested that children are capable of learning relaxation techniques over a relatively short period of time.

It is clear from previous research with both young adults and children, relaxation techniques can reduce test anxiety. The present study employed both deep breathing and progressive muscle relaxation to determine the effects of relaxation techniques on test anxiety levels in elementary school children. The purpose of this study was to test differences in anxiety levels between an experimental group (receiving relaxation training) and a control group (receiving no training).

Method

Participants

The sample was made up of 104 third-grade students at a Midwestern public elementary school, 58 males (55.8%) and 46 females. Ages ranged from 8 to 10 years with a median of 9 years. The greatest percentage of participants reported their race as

Caucasian (82.7%), followed by African American (3.8%), Hispanic (2.9%), and Asian (1.9%). The remaining participants identified themselves as Mixed (5.8%) or indicated “other” (2.9%).

Instrumentation

Westside Test Anxiety Scale. The Westside Test Anxiety Scale (WTAS; Driscoll, 2007) was designed to identify participants with anxiety impairments who could benefit from anxiety-reduction and yields a general test anxiety score. The WTAS consists of 10 items, each using a Likert response scale where 1 = “never true” and 5 = “always true.” The instrument was modified for the purpose of this study in an attempt to make the items easier to understand by the young participants. For example “exam” was replaced with “test,” “fail” was replaced with “bad job” and “mind sometimes wanders” was replaced with “daydream.”

The WTAS was constructed to measure anxiety impairments with six items assessing incapacity (i.e., memory loss and poor cognitive processing) and four items measuring worry and dread (i.e., catastrophizing) which interferes with concentration (Driscoll, 2007). Scores for the two subscales, incapacity (items 1, 4, 5, 6, 8, & 10) and worry (items 2, 3, 7, & 9) are obtained by summing the respective item responses; a total score is obtained by adding up the scores and dividing by 10 where higher scores indicate a greater level of test anxiety (Driscoll, 2004). The present researchers used the total score to obtain a general level of test anxiety.

Validity has been shown in some small samples. The WTAS has yielded a moderate positive correlation with the Cognitive Test Anxiety Scale (Cassidy & Johnson, 2002). The WTAS has also shown a negative relationship with gains in test scores (Driscoll, 2007). That is, as WTAS scores decreased, test scores increased. At the time this study was conducted, reliability information was unavailable. However, internal consistency estimates were calculated for the present study.

Procedure

Relaxation training and data collection took place at a Midwestern public elementary school. All third-grade students were invited to participate in the study. Those students who returned a signed parental consent form were included. All participants were given the WTAS (pre-test) and a short demographic questionnaire to complete.

Using the pre-test scores, a random matched-paired strategy was used to assign participants to the two experimental conditions. That is, pre-test scores were first rank-ordered. Next, participants with the two highest scores were randomly assigned to either the treatment group or control group. The procedure was repeated with subsequently lower scores until all participants were assigned. The initial size of the experimental and control groups were 53 and 54, respectively. Due to school absences, three participants of the experimental group did not complete the post-test measure.

Members of the experimental group were taught relaxation techniques by one of the investigators. Training took place at school, 2 days a week, over a 5-week period. On training days, the participants were moved from their regular classrooms to a quiet, empty classroom. During training, relaxing music was played in the background.

Members of the control group were given free time to read or complete assignments or went to recess. While in training, participants in the experimental group were taught both deep breathing exercises (i.e., elevator breathing) and progressive muscle relaxation (i.e., guided relaxation for children).

Elevator Breathing. Elevator breathing (Teel, 2005a) was one of the interventions utilized in this study to help children relax quickly when facing stressful situations. Breathing techniques are very important for inducing relaxation. Through training, an individual's breathing will automatically slow down and deepen, bringing more oxygen into their bodies and helping them to relax. Diaphragmatic breathing, or "belly breathing," is a particularly helpful way to release mental and physical stress and tension. It calms the mind and induces a state of relaxation in one's body. Elevator breathing incorporates visualization for children. Participants practiced breathing exercises for 5 minutes at each of the 10 sessions.

Guided Relaxation for Children. Guided relaxation for children (Teel, 2005b) was also utilized in this study to help manage levels of anxiety that children may be experiencing. Progressively relaxing each of the muscle groups along with deep breathing is intended to promote relaxation and counter the physiological components of arousal by first tensing the major muscle groups then relaxing those muscles. The investigator would instruct the students to get comfortable (e.g., lying down, closing eyes, or resting against a wall) and then began reading the relaxation script to the participants while incorporating the deep breathing. This portion of the experiment took approximately 8 to 10 minutes at each session.

At the conclusion of the 5 weeks, participants in both the experimental and control groups completed the Westside Test Anxiety Scale (post-test).

Results

Descriptive and inferential statistics for the present study are presented in Table 1. Pre-test differences in mean scores between the experimental and control groups showed no significant difference ($t(102) = 0.67$, ns) indicating no real differences in anxiety levels between the groups prior to initiating the experimental treatment. A significant difference between pre- and post-test mean scores was found for the experimental group ($t(49) = 2.39$, $p < .05$). There was no significant difference found between pre- and post-test mean scores for the control group ($t(53) = 1.62$, ns). The results showed a significant decrease in mean anxiety scores due to the relaxation training. Coefficient alpha estimates for the 10-item test anxiety scale were .85, .72, and .79 for the experimental, control, and combined groups, respectively.

Table 1: Descriptive and inferential statistics.

Group	Mean / sd (pre-test)	Mean / sd (post-test)	<i>t</i> -value (pre – post)	df	alpha
Experimental	27.7 / 8.9	24.8 / 10.2	2.39 *	49	.85
Control	26.8 / 7.8	25.0 / 9.3	1.62	53	.72
Combined	27.2 / 8.3	24.9 / 9.7	–	–	.79

* $p < .05$.

Discussion

The present study investigated the effects of relaxation techniques on test anxiety in elementary school students. Third-graders were taught two relaxation techniques, after which the group reported a significant decrease in anxiety as compared to a group of their peers receiving no training. Participants in this study were from 8 to 10 years of age. This present study's results supported earlier findings that relaxation techniques can be learned and utilized by young children (Lohaus & Klein-Hessling, 2003; Zaichkowsky & Zaichkowsky, 1984).

A limitation of the present study reflects a procedural issue. The participants were not faced with high-stakes testing when they were trained the relaxation techniques. Utilizing an alternative procedure in which participants are preparing for scheduled mandated testing is suggested. While the present findings of reduced anxiety were significant, results from an actual testing scenario could suggest other, alternative interpretations.

The increasing use of high-stakes testing in American public schools (see *No Child Left Behind Act of 2001*) has produced a corresponding increase in test anxiety among children (Black, 2005). This higher anxiety can result in students becoming overly concerned with the consequences of failure (Spielberger & Vagg, 1995) and adversely affecting their ability and desire to learn (Cheek et al., 2002).

Parents, teachers, and counselors alike can take a more active role in becoming aware of the effects of test anxiety. High-stakes testing is causing elementary students to exhibit intensified physiological responses (Vandenbos, 2007; Zeidner, 1998), negative emotional reactions (Paul, Elam, & Verhulst, 2007; Triplett & Barksdale, 2005) and inappropriate behaviors (Cheek et al., 2002). One cannot presume that all students experience test anxiety in the same manner, or for the same reasons. School teachers' and parents' knowledge and awareness of the effects of high-stakes testing at the elementary level is a first step towards identifying it as a problem for one's students or children. Identifying the signs of test anxiety in young children can alert school officials and parents to the need for intervention. Deep breathing and progressive muscle relaxation activities can be helpful.

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