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An examination of the role of school climate in adolescent test anxiety

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AN EXAMINATION OF THE ROLE OF SCHOOL CLIMATE IN ADOLESCENT TEST ANXIETY

by

LEA ANN IMASA

DISSERTATION

Submitted to the Graduate School

of Wayne State University,

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Approved by:

Advisor

Date

DEDICATION

To my husband Mark and children Alexandra, David, and Isaac,
and my mother, father and mother-in-law,
whose continuous support and unwavering confidence
made this goal possible to achieve.

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CHAPTER 1

INTRODUCTION

Test Anxiety

In January, 2002, the *No Child Left Behind Act* of 2001 was signed into law as a reauthorization of the Elementary and Secondary Education Act (ESEA). One of the aims of this Act was to hold all schools receiving federal funding “accountable for improving student achievement.” The improvements in achievement are to be demonstrated through results of standardized testing administered annually in grades three through eight and once in grades nine through twelve. This expanded use of standardized testing is being used in many school districts to evaluate the overall effectiveness of the entire district, as a result of growing political pressure to repair what some perceived as a struggling public school system (Mulvenon, Stegman, & Ritter, 2005). The use of these test results to make decisions about school funding, teachers’ tenure and salary, and grade promotion or graduation has been termed “high-stakes testing” and has resulted in significant changes in the current public education system (Kubiszyn & Borich, 2000).

Prevalence of Test Anxiety

One of the changes resulting from the increase in high-stakes standardized testing is a heightened awareness of and interest in the impact of this testing on students (Mulvenon et al., 2005). Pressure exists from many sources on school administrators and teachers for their students to achieve proficiency on these tests, which has resulted in an increase in test anxiety among elementary and secondary students in U.S. public schools (Whitaker Sena, Lowe, & Lee, 2007). Many studies have found that the number of

students experiencing test anxiety is more than 33%, and that this percentage is rising with the increased use of high stakes standardized achievement testing (Lowe et al., 2008). Early studies of test anxiety performed in the 1960s and 1970s found prevalence rates in the 10-25% range (Whitaker Sena et al, 2007). A study of test anxiety in African American students in a public school district in an urban district in the city of Pittsburgh found prevalence rates as high as 41% in children age eight to twelve (Turner, Beidel, Hughes, & Turner, 1993).

Implications

Test anxiety in school-aged children has a wide range of implications, the two most notably being that test anxiety has a negative effect on school performance, and that it has also been shown to be related to poor self-esteem and self-concept along with poor peer relationships (Turner et al., 1993). Early researchers Yerkes and Dodson in 1908 differentiated between the facilitating and debilitating effects of arousal or anxiety on performance. They described the effects of physiological arousal on performance as having a curvilinear nature, such that some degree of arousal or anxiety would actually enhance performance. While this theory was influential, test anxiety since that time has been widely conceptualized almost exclusively as having negative effects on performance. Despite the curvilinear relation suggested by Yerkes and Dodson, the practice of measuring debilitating and facilitating effects of anxiety on performance separately has not been empirically supported or widely adopted (McDonald, 2001).

In general, test anxiety is related to poorer performance when measured across multiple academic areas, with correlation coefficients as high as -0.5 and -0.6 (McDonald, 2001). Hembree (1988) found in a meta-analysis of over 500 studies that

test anxiety reduced academic performance at almost every educational level between elementary school and college (Chapell et al., 2005). In an extensive review of literature, Hopko, Hunt, and Armento (2005) found support for negative correlations between anxiety and performance on mathematical tasks, academic tests, intelligence tests, working memory tasks, reading comprehension tasks, social interaction, and musical performances, among others. This relation between anxiety and poor performance appears to be even stronger among junior high and high school students than among elementary students (Turner et al., 1993).

In addition to the robust findings related to test anxiety and the negative relations with academic performance, several researchers have found that test anxiety is related to decreased or impaired social functioning and development. Turner and colleagues (1993) summarized from previous research that test-anxious students have more negative self-evaluations than their low test-anxious peers. They also have poorer global self-esteem and fewer positive peer relationships. Children high in test anxiety perceive themselves to have lower cognitive ability level and general self-worth than low test-anxious peers, and display higher generalized anxiety and more overall negative mood (Turner et al., 1993).

Summary of Factors That Predict Test Anxiety

Test anxiety occurs across a continuum, and there is a great degree of interpersonal variation in degree of test anxiety. A wide variety of factors have been examined in relation to test anxiety. One of the most influential early cognitive models used to conceptualize test anxiety is that of Liebert and Morris. Their model is an *interference* model, suggesting that test anxiety disturbs the recall of prior learning during

the examination situation. Liebert and Morris suggested that test anxiety is comprised of two components: worry and emotionality. The worry factor refers to the thought processes that occur during preparation for, in anticipation of, and during the process of examination or performance that interfere with attention and concentration. The emotionality component refers to the autonomic arousal that occurs during the examination situation and triggers off-task thoughts that impede successful performance (Turner et al., 1993). More recent interference models also examine the role of test anxiety in the preparation phase of the learning-testing cycle (Cassady, 2004). While proponents of interference models recognize the contextual variables related to worry and emotionality, the main focus of this perspective is on intrapersonal factors. Thus, much of the past research has focused on the individual's intrapersonal factors that are related to test anxiety. For example, University of Kansas researchers have recently developed a model of test anxiety, including an instrument with which to measure it (Test Anxiety Inventory for Children and Adolescents; Lowe et al., 2008). With this model, the intrapersonal variables found to be related to the development of test anxiety included intelligence, social-emotional functioning, trait anxiety, study skills, academic ability, and academic self-efficacy (Lowe et al., 2008). Whitaker-Sena and colleagues (2007) also found that having a learning disability or deficit in attention, as well as overall levels of cognitive interference, were predictors of high levels of test anxiety.

However, other literature has indicated that an interaction between intrapersonal variables and context is important to consider. For example, in a comprehensive literature review, McDonald (2001) found the list of factors related to test anxiety included: academic expectations of parents, with children fearing the consequences of

not meeting these expectations; being praised for achievement rather than effort, which leads to differences in motivation and attribution; having a high level of comparison with peers and/or being in a highly competitive classroom environment; and the recent trend of publicly evaluating schools using standardized test results. In addition, McDonald (2001) consistently found that gender and ability level are also related to test anxiety, with higher prevalence rates among females and among students with moderate to high academic ability.

The variables that have been shown to account for the most variance in test anxiety are self-concept (Hembree, 1987) or self-efficacy (Lowe et al., 2008); classroom conditions (including teacher anxiety, teacher harshness or negativity, high level of competition among students, and high-stress testing conditions) (Hembree, 1987; McDonald, 2001); social-emotional functioning (including proneness to general anxiety or temperamental fearfulness) (Cohen, Ben-Zur, & Rosenfeld, 2008; Hembree, 1988; Lowe et al., 2008) and ability level or GPA (Hembree, 1987; Lowe et al., 2008;). Although these factors have been shown to account for a large proportion of variance in test anxiety, there are additional factors and perspectives that have not been considered or have been under-utilized in prior research. These are introduced next.

Developmental Systems Perspective

A developmental systems perspective asserts that behavioral and emotional outcomes of adolescents are explained by interactions between individual differences and contextual factors (Lerner, 2005; Lerner & Castellino, 2002). According to this view, variations in specific adolescent outcomes are due to differences in individual responses to contextual variables. These contextual variables can function as risk factors, or they

can function as protective factors that moderate risk factors at the intrapersonal level. Proponents of this view suggest that individuals are embedded within multiple developmental contexts and that outcomes cannot be explained solely by the effects of individual differences or contextual factors, either independently or additively (Downer, Rimm-Kaufman, & Pianta, 2007; Loukas & Murphy, 2007). Within this framework, test anxiety is seen as resulting from an interaction between intrapersonal variables (including a predisposition to experience anxiety) and the demands of the situation, which are affected by environmental variables (Lowe & Reynolds, 2004; McDonald, 2001).

This study examined factors that contribute to test anxiety within a developmental systems perspective. While extensive literature exists examining the contributions of individual intrapersonal and individual contextual factors to the development of test anxiety, there is considerably less existing research using a developmental systems perspective. The research is even further limited in examining what factors might play a moderating role in, or serve as a protective factor against, the development of test anxiety. Based on past research findings and an interference model of test anxiety, several key intrapersonal and contextual variables were included in this study. Reviewed in turn next, the intrapersonal variables studied were effortful control, academic self-concept, academic performance, and perceived threat of tests. The contextual variables studied were unrealistic parental expectations for achievement and school climate, each examined from students' perspectives. School climate was examined as a moderating variable, and was hypothesized to serve as a protective factor against test anxiety.

Intrapersonal Variables

Effortful control. Effortful control, or the ability to inhibit a dominant response in order to perform a subdominant response, is an aspect of one's temperament (Rothbart & Jones, 1998). It is intimately linked to executive attention, and includes the ability to shift and focus attention, as well as the ability to control emotional and attentional responses. Effortful control is related to test anxiety in that students high in fearfulness but low in effortful control have attentional biases toward threatening stimuli (such as physiological arousal and negative self-talk or intruding thoughts) and have difficulty switching attention to stimuli salient to successful completion of the task (Moriya & Tanno, 2008). Effortful control serves as a protective factor against the development of emotional and behavioral disorders, especially among those individuals with temperament traits that put them at risk for such disorders (Rothbart, Ellis, Rueda, & Posner, 2003). Poor quality school environments have been shown to be especially problematic for students low in effortful control, due to the students' increased risk for frustration, peer rejection, conduct problems, and internalizing problems (Loukas & Murphy, 2007).

Academic self-concept. In general, academic self-concept is related to a student's confidence in his/her academic ability and to the expectations for success or failure on academic tasks. Low academic self-concept has been shown to be related to higher levels of anxiety in academic performance situations. Students who are highly anxious in performance situations are more likely to experience academic failure, which then leads to further reinforcement of their poor academic self-concept (Fite, Howard, Garlington, & Zinkgraf, 1992). An increase in the frequency of high stakes testing

situations leads to increased opportunities for students' anxiety and self-concept to be affected. Hembree's meta-analysis (1988) found a strong inverse association between self-esteem and test anxiety.

Academic performance. Much of the existing research has included grade point average (as a measure of past academic performance) as either a predictor or outcome variable related to test anxiety. Chapell and colleagues (2005) found a significant negative relation between GPA and test anxiety among undergraduate and graduate students. Zeidner and Schleyer (1998) also found an inverse relation between scores on measures of test anxiety and GPA, but in students in upper elementary and middle school grades. They also found that GPA was more strongly correlated with the worry component of test anxiety than the emotionality component.

Perceived threat of tests. Mulvenon and colleagues (2005) have provided a review of research illuminating the negative effects on performance associated with increased frequency of standardized testing and high-stakes accountability programs. In their multifaceted study, they found that one of the main factors influencing scores on standardized tests was students' perception of a high level of negative pressure from teachers and administrators regarding performance on such tests. Prior to that research, Hembree (1988) had also found in a meta-analysis that test anxiety was related to the students' perceptions of whether it was a high-stress or high-stakes test compared to non-evaluative low-stress testing conditions.

Contextual Variables

Unrealistic parental expectations for achievement. *Anxiety in Elementary School Children* was an integral contribution to early research in the area of test anxiety

(Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960). In this book, researchers found that the test anxious response was related to past experiences with evaluative situations in the home. From these findings, they hypothesized that test anxiety had unconscious meanings related to certain dynamics of the parent-child relationship. Ablard & Parker (1997) found that while a moderate level of parental support for high achievement can facilitate performance, unrealistic parental expectations can create pressure and performance anxiety in their children. They found that parents are overly critical or have a performance goal orientation toward achievement have children at higher risk for performance anxiety. In another study examining perfectionism in gifted versus non-gifted students, it was found that students who rated their parents as being critical and having unrealistically high expectations for their performance also scored high on measures of anxiety in general (Parker, 1997) .

School climate. School climate is a complex multidimensional construct that includes organizational, instructional, and interpersonal components and contributes to the development of individual and group values, behaviors, and norms within the school (Loukas & Murphy, 2007; Loukas & Robinson, 2004). These instructional and emotional qualities of the school and classroom are highly related to achievement and moderate effects of risk factors for other negative outcomes (Pianta, Belsky, Vandergrift, Houts, & Morrison, 2008). In addition to being related to academic achievement, certain school climate variables have been shown to be related to self-regulation, internalizing problems, and social competence among both elementary and middle school students (Brand, Felner, Shim, Seitsinger, & Dumas, 2003; Pianta et al., 2008; Wilson, Pianta, &

Stuhlman, 2007). School climate, particularly student-student relationships, has also been shown to be related to test anxiety (Tanzer, 1990).

School climate has been shown to act as a moderating variable for several negative outcomes, primarily through the fostering of self-regulation. Loukas & Robinson (2004) and Loukas & Murphy (2007) have shown school climate to moderate the risk for depressive symptoms and conduct problems among children low in effortful control. School climate was shown to moderate the risk of socially bold children in developing problem behaviors and negative peer interactions (Wilson et al., 2007). School climate has also been shown to have a moderating effect on the performance of students who report feeling anxiety and pressure surrounding the process of standardized testing (Mulvenon et al., 2005). However, school climate has not been examined for its possible moderating role with the variables included in this study.

Limitations of Past Research and Purpose of This Study

Test anxiety is a complex and multidimensional construct that has serious implications for academic and emotional outcomes for children, particularly adolescents. As the stakes become higher for schools with regards to results of standardized test scores, the educational community is becoming more concerned with maximizing student performance in evaluative situations. Past research on test anxiety has focused on identifying individual predictor variables, either intraindividually or contextually. One of the greatest limitations of previous research is the relative lack of research on school climate with test anxiety in general, and in the moderating role of school climate on effortful control, specifically. The current study combined many factors using a developmental systems model to better explain the variance in test anxiety, and also

examined the moderating role of school climate. The intrapersonal variables studied were effortful control, academic self-concept, academic performance, and perceived threat of tests (including the perceived level of importance of test performance for academic success). The contextual variables studied were unrealistic parental expectations of achievement and school climate. This combination of factors was proposed to be comprehensive and maximally predictive of explaining the variance in test anxiety among adolescents. Additionally, because gender differences in test anxiety had been found in past research (Cassady & Johnson, 2002; Eum & Rice, 2011; Lapointe, Legault, & Batiste, 2005; McDonald, 2001), it was determined that gender would be controlled for in the main analyses if significant differences were found when variables were analyzed by gender.

Research Questions

Based on the review of literature and perceived limitations of prior test anxiety research, the following research questions were posed.

1) How well do the individual intrapersonal variables (effortful control, academic performance, academic self-concept, and perceived threat of tests) explain the variance in levels of self-reported test anxiety, after controlling for the hypothesized mediation effect of academic self-concept on GPA? Among these variables, what is the relative contribution of each in explaining the variance in test anxiety? It was expected that the relation between academic performance (GPA) and test anxiety is mediated by academic self-concept. It was also expected that students low in effortful control, especially those with poor

academic performance, poor academic self-concept, and a high level of perceived threat of tests, would display the highest levels of test anxiety.

2) How well do the contextual or environmental variables (unrealistic parental expectations and school climate) explain the variance in levels of self-reported test anxiety? Among these variables, what is the relative contribution of each in explaining the variance in test anxiety? It was expected that students with unrealistic parental expectations who are in a more negative school climate would display the highest levels of test anxiety.

3) What is the combined role of the intrapersonal and contextual variables, with school climate as a moderator, in explaining a statistically significant proportion of variance in self-reported levels of test anxiety? It was expected that a positive school climate would moderate the relation of effortful control and self-reported level of test anxiety.

Significance of the Study

The results of this study were expected to contribute a more thorough understanding of the factors that contribute to the development of test anxiety in adolescents. Understanding test anxiety within a developmental contextual framework allows school psychologists, social workers, administrators, and counselors to better intervene in cases where test anxiety is interfering with students' academic performance. Considering that student achievement as measured by high-stakes standardized testing is becoming increasingly more important to educators across the country, it is timely to consider the correlates and effects of test anxiety in order to improve student outcomes in performance.

CHAPTER 2

LITERATURE REVIEW

Overview

Test anxiety is a rising concern among students, teachers, and parents, especially as increased accountability in public education is resulting in more frequent use of high-stakes tests as measures of student achievement. The concept of test anxiety is multifaceted, and includes academic, emotional, and environmental aspects as contributing factors. The most comprehensive way to examine the factors that contribute to the presence of test anxiety is through a developmental systems model, which emphasizes the interconnectedness and reciprocal interactions between individual and environmental factors. The intraindividual factors examined in relation to test anxiety in this study were effortful control, academic self-concept, academic performance, and perceived threat of testing. The contextual variables examined were unrealistic parental expectations for achievement and school climate. Lastly, school climate as a possible moderating factor was discussed.

Test Anxiety

The passage of the *No Child Left Behind Act* in 2002, an extension of the reauthorization of the Elementary and Secondary Education Act (ESEA), included a plan for holding all schools accountable for improving student achievement through annual standardized testing. While the concept of “high-stakes testing” was not new in 2002, growing political pressure to address what many perceived as a struggling public school system led to increased public awareness of the ways in which student achievement is measured. Many researchers have argued that this increased awareness has had a

negative impact on students, especially in levels of anxiety surrounding testing (Johnson, Larson, Conn, Estes, & Ghibellini, 2009; Lowe et al., 2008; Mulvenon et al., 2005; Whitaker Sena et al., 2007).

Early studies of test anxiety performed in the 1960s and 70s found prevalence rates among elementary and secondary students in the range of 10-20% (McDonald, 2001; Whitaker Sena et al., 2007). In the early 1990s, Turner found the overall prevalence of test anxiety in her sample of African American public school students to be 41% (Turner et al., 1993). Turner's rate may be slightly misleading, as research has shown that test anxiety typically is higher in minority students than in white students, but recent research estimates that more than one third of all students in U.S. schools experience test anxiety (Lowe et al., 2008). While many researchers have found higher rates of test anxiety among females than in males, Hembree's meta-analysis (1988) found that this did not translate into differences in performance. Other researchers have also attributed this difference to the fact that females are more likely to report any type of internalizing symptom than are males (McDonald, 2001; Turner et al., 1993).

There exists a wealth of research examining the negative effect test anxiety has on performance, with an increased interest in the subject having arisen in the 1970s (Greene, 2005). Although very early research on anxiety and performance suggested a curvilinear relation between the two variables, leading to the examination of facilitating versus debilitating effects of anxiety, test anxiety has generally been conceptualized as having only debilitating effects on academic performance (McDonald, 2001). Hembree's (1988) comprehensive review of earlier test anxiety research found that test anxiety reduced academic performance at all educational levels. One meta-analysis reported that based

on the size of the negative correlation between test anxiety and performance, even when controlling for ability level, approximately 39% of low test-anxious students would fail an examination compared to 61% of high test-anxious students failing the same exam (Seipp, 1991). Performance anxiety has been found to affect performance among many domains, such as mathematical tasks, tests of cognitive or intellectual functioning, working memory tasks, and reading comprehension tasks, to name a few (Hopko, Hunt, & Armento, 2005).

In addition to its negative effect on performance, test anxiety has implications for children's social and emotional functioning as well. Unlike other childhood fears that disappear without permanent effects, fears with social evaluative bases, such as test anxiety, are chronic, persisting well into adulthood, and are generally more problematic overall (Turner et al., 1993). Past research has shown that moderate and high test-anxious students suffer from lower self-worth or self-esteem and higher generalized anxiety (Hembree, 1998; Turner et al., 1993). Turner and colleagues (1993) reported that these students have fewer positive peer relationships and overall more negative mood. High test-anxious students are also more likely to drop out of high school (Lowe et al, 2008).

The investigation of test anxiety as a psychoeducational construct began in the early 1950s by researchers Sarason and Mandler at Yale University, who interpreted differences in performance between high anxious and low anxious students on the basis of learned psychological drives. They differentiated between *task-directed drives* and *anxiety drives*, and theorized that students with strong anxiety drives enact the task-irrelevant thoughts and behaviors that impede performance. In the early 1960s,

researchers Alpert and Haber built on the psychological drives interpretation by labeling the drives that lead to either task-focused or task-irrelevant behaviors as *facilitating* and *debilitating*, respectively (Hembree, 1988). From there, Liebert and Morris proposed that debilitating anxiety was in itself bi-dimensional, consisting of the factors of *worry* and *emotionality*. Worry refers to the more cognitive aspect of anxiety, such as negative expectations, interfering self-talk, and concerns about potential consequences. Emotionality refers to the physiological factors involved in the experience of anxiety, such as nervousness, tension, elevated heart rate, and sweating (Muris & Meesters, 2009).

For the purposes of this study, the worry, or cognitive, component of test anxiety was examined as an outcome variable. The cognitive (worry) and emotional aspects of the anxiety experience are expected to co-vary in many real-life anxiety provoking situations because the situations typically contain elements related to the arousal of each. However, the cognitive and emotional components are theorized to be conceptually independent, in that the two components are aroused and maintained by different conditions of the anxiety situation. Morris and colleagues conducted three major studies demonstrating this independence of cognitive and emotional responses to anxiety producing situations (Morris et al., 1981). From that research, Morris and colleagues proposed that the cognitive aspect of anxiety is aroused and maintained by factors that influence one's cognitive evaluations of the situation. The emotionality component, in contrast, is aroused primarily by initial, non-evaluative cues such as a teacher handing out the test, other students talking about the test, etc., which lose their arousing potential once attention is turned to the test itself. Levels of emotional response typically decrease significantly as the testing session progresses. Levels of worry, or the cognitive

component of anxiety, however, typically remain stable through the examination session (Cassady & Johnson, 2002; Hembree, 1988; Morris et al., 1981). It is because of this that the cognitive component of test anxiety is more consistently and strongly related (inversely) to performance than is the emotionality component (Cassady, 2004; Morris et al., 1981).

Cognitive interference (as it is manifested in test anxiety) has been well established as a cause for reduced performance during evaluative situations (Cassady, 2004; Hembree, 1988; Muris & Meesters, 2009; Veenstra, Lindenberg, Oldehinkel, DeWinter, & Ormel, 2006). Cassady and Johnson (2002) expanded on the research regarding the cognitive aspect of test anxiety and its relation to performance by examining the role cognitive interference plays in all stages of the learning-testing cycle. In their work, they referred to Liebert and Morris' worry component as "cognitive test anxiety." They define cognitive test anxiety as "individuals' cognitive reactions to evaluative situations, or internal dialogue regarding evaluative situations, in the times prior to, during, and after evaluative tasks" (Cassady & Johnson, 2002, p. 272). Examples of some of the thoughts of students high in cognitive test anxiety include: comparing self to peers, consequences of failure, low confidence in performance, excessive worry, disappointing parents, and feeling unprepared (Cassady & Johnson, 2002). Hembree, in his meta-analysis (1988), found that this cognitive component of test anxiety is the factor that is most consistently found to be associated with poor performance.

Test anxiety influences all aspects of the learning-testing cycle, which includes preparation, performance, and reflection phases. Proponents of the view that cognitive

interference is the major factor in test anxiety suggest that students high in test anxiety have an inability to suppress interfering thoughts during an examination situation (performance phase). This results in the students' difficulty attending to the relevant cues that promote performance, and in difficulty with retrieval of previously learned information (Cassady, 2004). Additionally, the anxiety experienced during the test results in overall distractibility by irrelevant environmental stimuli. These interfering factors affect test performance in highly test-anxious students regardless of the format of the test, the difficulty of the items, or the amount of time allowed (Cassady, 2004).

Cognitive test anxiety affects performance during the testing session through the misdirection of attention and difficulty with retrieval. Cognitive test anxiety can also affect performance in other phases of the learning –testing cycle (test preparation, test performance, and test reflection). Interfering thoughts related to evaluation can occur during the initial learning of the material as well as during the review and preparation for tests, affecting encoding and storage efforts. Naveh-Benjamin (1991) suggests that students with test anxiety are affected in all phases of the cycle, leading to deficits in encoding, organization, and retrieval of information. Cognitive interference during preparation for tests leads to poor conceptual understanding and/or organization of the material, limiting the ability to retrieve relevant information during testing (Naveh-Benjamin, 1991). High levels of test anxiety lead to interruptions in the articulatory processing loop of working memory, which result in inefficient processing of verbal information (Veenstra et al., 2006). Additionally, students who are highly test-anxious have inadequate metacognitive skills and self-monitoring during test preparation. This can result in one of two negative outcomes; either they are then more likely to

overestimate their level of preparedness for the test, or they feel incapable of success and evidence avoidant behaviors such as procrastination (Cassady, 2004).

The final way in which cognitive test anxiety affects performance is during the reflection phase. Performance effects during this phase are typically due to attributional biases that lead to future maladaptive test behaviors. High levels of anxiety often lead to external attributions for success while attributing failure to lack of ability (Cassady, 2004). According to Bandura's theory, these types of attributions result in decreases in self-efficacy and future attempts to avoid failure. Decreases in self-efficacy also increase the likelihood that future tests will be perceived as threatening rather than challenging. As the test-anxious student continues to attribute failure to ability, he becomes more likely to feel helpless and disengage from academic tasks, essentially ensuring continuing failure. Additionally, when the reflection phase of one examination experience blends into the preparation for the next, the longer the student fixates on the negative outcomes of the previous test, the less efficient they will be preparing for the upcoming one (Cassady, 2004; Cassady & Johnson, 2002). It is in this way that highly test-anxious students develop avoidance that leads to self-handicapping behaviors related to learning and testing (Zeidner & Schleyer, 1998).

Developmental Systems Perspective

The current study examined predictors of test anxiety using a developmental systems perspective. Developmental systems theories assert that development involves bidirectional influences between levels of organization "ranging from biology through individual and social functioning to societal, cultural, physical ecological, and ultimately, historical levels of organization" (Whitaker Sena et al., 2007, p. 3). The desire to

integrate contextualism and organicism resulted in the developmental systems perspective, which is a meta-theory encompassing many individual theories of human development. The commonality among all developmental systems theories is the presence of four interrelated components: (a) change and relative plasticity; (b) relationism and the integration of levels of organization; (c) historical embeddedness and temporality; and (d) the limits of generalizability, diversity, and individual differences (Lerner, 2005; Lerner, Almerigi, Theokas, & Lerner, 2005; Lerner & Castellino, 2002).

Developmental systems perspectives assert that relative plasticity, or the potential for change, exists across the life span. This component is crucial because it forms the basis for the perspective's focus on systematic change. Developmental systems perspectives acknowledge that systematic change is somewhat limited by past developments and contemporary conditions. The recognition of the importance of relative plasticity is essential, however, in that it legitimizes the efforts of policies and programs that seek to promote positive development (Lerner et al., 2005). For example, the belief in relative plasticity of intellectual ability provides justification for school-based interventions aimed at enhancing cognitive development. This is in stark contrast to policies and programs based on mechanistic or genetic reductionist theories that suggest that the upper limits of cognitive development are constrained by inherited traits.

Another important commonality among developmental systems perspectives is the concept of relationism and the integration of levels of organization. These theories stress that the basis for change is the relationships that exist among multiple levels of organization. These levels range from:

The inner biological, through the individual and psychological and the proximal social relational (e.g., involving dyads, peer groups, and nuclear families), to the sociocultural level (including key macroinstitutions such as educational, public policy, governmental, and economic systems) and the natural and designed physical ecologies of human development (Whitaker Sena et al., 2007, p. 10).

Developmental systems perspectives view these levels as structurally and functionally integrated, resulting in an “inextricably fused developmental system” (Whitaker Sena et al., 2007, p. 11).

The third conceptual component of any developmental systems perspective is that of historical embeddedness and temporality. The broadest level of organization in the person-context system is history. None of the other levels can be isolated from the effects of historical change, and change over time is an inevitable feature of variables from all the levels of organization. Developmental systems perspectives assert that because historical change is infused in all levels of organization, change-sensitive designs (such as longitudinal) are necessary when studying human development in order to determine whether historical changes make a difference for any given developmental outcome (Whitaker Sena et al., 2007).

The final component of the developmental systems perspective is the concept of the limits of generalizability, diversity, and individual differences. Changes that are seen within one historical period may not be seen at a different point in time because of the specific set of instances in the variables from multiple levels of ecology. Developmental systems theorists recognize that results from one data set may not be generalizable to another because of the unique contribution of influence of historical factors. In addition, diversity of the population under consideration is important in understanding data

through a developmental systems perspective, which recognizes that characteristics of the population studied limit the degree to which results can be generalized to other populations. One example of this is that of puberty's influence on parent-adolescent relationships. A review of research on American adolescents could lead the reader to determine that pubertal maturation negatively affects the relationships between youth and their parents. The research upon which this was based, however, was conducted in large part with a homogeneous sample of European American families. When cultural diversity is introduced, a much different pattern of change in relationship emerges, revealing that in other ethnic groups, pubertal maturation actually improves the relationship between parents and adolescents through greater parental social support and lower levels of parent-adolescent conflict (Lerner, Theokas, & Bobek, 2005; Whitaker Sena et al., 2007).

There are many reasons that a developmental systems perspective is important in conceptualizing relations between predictor and outcome variables in research with adolescents. The levels of organization within the developmental system are constantly changing, from the biological level of intrapersonal variables specific to the adolescent, to the broader cultural and historical context. Change within one level is reciprocally related to changes within all of the other levels. Adolescent developmental outcomes (social, emotional, behavioral, academic, etc.) are the result of these changes in the whole system. The bi-directional nature of the relations among variables at different levels of organization represents extreme complexity that must be addressed in adolescent development theory and research. If the fact that adolescents are both the product and

producer of person-context relationships is ignored, the corresponding research and/or application will be inadequate (Lerner & Castellino, 2002).

In summary, past research has already identified a broad range of variables that are known to contribute to test anxiety. The most comprehensive understanding of test anxiety, however, will result from the examination of these variables in different combinations and within a developmental systems perspective. It is clear from a review of the existing research the importance of studying several different individual and environmental factors, including moderating variables, to gain a more thorough understanding of test anxiety. The following review discusses some individual and contextual factors that are associated with the presence of test anxiety.

Intraindividual Factors Included in the Current Study

Effortful Control. Effortful control, defined by Mary Rothbart as “the ability to suppress a dominant response in order to perform a subdominant response” (2003, p. 1114), is an aspect of one’s temperament. In contrast to many preceding theorists who conceptualized temperament in terms of behavior only, Rothbart and colleagues offered an integrated understanding of temperament that included investigation of individual differences at the genetic, neural, endocrine, autonomic, and central nervous system levels (Putnam & Stifter, 2008). Within this framework, certain temperament characteristics, such as emotionality, become increasingly regulated by control mechanisms such as inhibition, activation control, and attention (Lerner & Castellino, 2002). These control mechanisms are collectively referred to as effortful control, the development of which plays a crucial role in Rothbart’s view of development. Effortful control allows a child to suppress tendencies driven by certain temperament

characteristics, allowing them “freedom from affectively driven behavior” (Lerner & Castellino, 2002). For example, an infant who is predisposed to negative affect may demonstrate low negativity as a school-aged child after developing strong effortful control, resulting in the ability to regulate cognitive and emotional responses. Through wide-scale literature reviews, Rothbart and colleagues have linked individual differences in effortful control to the development of empathy, development of conscience, and lower levels of overall psychopathology and maladjustment (De Wit, Karioja, Rye, & Shain, 2011; Lerner & Castellino, 2002). In addition, low levels of effortful control have been identified as a risk factor for aggressive and delinquent behavior, adolescent substance use, and deviant peer associations.

The development of effortful control is linked to the nervous system function of executive attention, and develops rapidly during the toddler, preschool, and early elementary school years (Posner & Rothbart, 1998; Putnam & Stifter, 2008; Rothbart & Jones, 1998). Posner and colleagues have identified networks of neural areas that serve the specific functions of “achieving and maintaining an alert state, orienting to sensory input, and voluntary control of thoughts and emotions” (P., 1998, p. 483). These neural areas are found mainly in the prefrontal cortex, anterior cingulate, and basal ganglia, and the main function of this executive functioning network is hypothesized to be the resolution of conflict. The development of this network in children is then intricately linked with the ability to choose among the competing responses (both cognitive responses and emotional responses) which will be dominant at any given moment (Lerner & Castellino, 2002). In real-life situations, this is manifested in the ability to delay gratification and in the development of conscience, for example. Certain portions of this

neural network, such as those involved in working memory and divided attention, undergo extensive maturation during the adolescent years (Eum & Rice, 2011).

Rothbart and colleagues also studied the relations of certain temperament traits to classroom behaviors, including mastery motivation, fear of novelty, and anxiety about the learning environment. Based on individual differences in temperament, children respond differently to the same learning environment. Children who temperamentally are more easily overwhelmed by intense levels of stimulation in the classroom will be more likely to react with discomfort that then interferes with processing of information. Temperamental reactions like these form the basis for affective evaluations of the classroom setting specifically or the learning process in general. Another temperament trait important in understanding academic behavior is positive affect/approach, which has been argued to be a precursor to mastery motivation. Key aspects of mastery motivation include persistence on difficult tasks, a preference for challenge, and a desire to feel control over one's environment. Alternatively, children who are high in temperamental fearfulness and frustration have the tendency to avoid challenge, view themselves as having a low likelihood of success, and perceive novel academic situations as threatening (Rothbart & Jones, 1998). Reactions to evaluative situations, especially, can be affected by levels of temperamental fearfulness. Children high in temperamental fearfulness show signs of withdrawal and decreased interest in challenging tasks when they feel they are being evaluated by others. Research has also shown that children high in fearfulness show greater changes in heart rate and pupil dilation when faced with certain cognitive challenges (Alexander-Passe, 2008).

However, all of the temperament traits that have the potential to impact classroom and test performance, including fearfulness, are affected by a child's developing effortful control. It is in this way that the development of strong effortful control serves as a protective factor against the negative outcomes associated with certain temperament traits. Rothbart found that students with high levels of effortful control have strengths in planning, attending to long-term academic goals, and persisting in the face of distraction (Rothbart & Jones, 1998). What this also means, however, is that deficits in effortful control can exacerbate the potential of certain temperament traits to have negative outcomes in the classroom. For example, students high in fearfulness who have low levels of effortful control have difficulty switching attention from one aspect of a task to another (e.g., from meaning to color in a Stroop task). These students also had difficulty redirecting self-focused attention (e.g., from bodily sensations back to the task at hand), and were more likely than students with high levels of effortful control to over-attend to threatening and irrelevant stimuli (Moriya & Tanno, 2007).

Academic Self-Concept. In Bandura's Social Cognitive Theory, self-concept is defined as "a composite view of oneself that is formed through direct experience and evaluations adopted from significant others" (Lowe & Reynolds, 2004, p. 409). Self-concept is conceptualized mainly in terms of self-evaluation; someone with a positive self-concept tends to judge himself favorably, while someone with a negative self-concept tends to devalue himself (Lowe & Reynolds, 2004). Self-evaluation patterns and standards can vary within individuals for different realms of performance, such as social competence, academic potential, or athletic performance. Academic self-concept (one's beliefs about his/her competence in academics) is one important dimension of self-

concept and of overall self-esteem in school-aged children. It is critically related to school performance because it influences the types of academic activities a student chooses, how much they challenge themselves in those activities, and the level of persistence they exhibit in the process (Fraser, 1984; Fraser & Rentoul, 1982; Lowe & Reynolds, 2004). Meta-analyses of the research in self-concept suggest that as much as one third of the variance in academic achievement can be accounted for by academic self-concept alone (Fraser & O'Brien, 1985; Fraser & Rentoul, 1982). Academic self-concept is closely tied to students' grades and test performance, as those provide the most frequent opportunities for self-evaluation and comparison with peers. Poor academic self-concept is related to several negative outcomes in school-aged children and adolescents. Low academic self-concept has been shown to be a major predictor of academic underachievement (Fraser, 1984; Fraser & Rentoul, 1982). Academic self-concept has also been shown to have a negative relation with overall anxiety in general, and with performance anxiety in particular (Fite et al., 1992; Putwain, 2009). It has also been suggested that low academic self-concept leads to the anticipation of negative outcomes (Putwain, Woods, & Symes, 2010). This results in the evaluation situation being perceived as threatening, which puts the student at higher risk for test anxiety.

Academic Performance. Much of the existing research has included grade point average (as a measure of academic performance) as either a predictor or outcome variable related to test anxiety. Chapell and colleagues (2005) found statistically significant reductions in GPA among highly test-anxious undergraduate and graduate students. The significant differences found in GPA between high test-anxious and low-test anxious students were even more pronounced in female students than in males. Zeidner and

Schleyer (1999) also found an inverse relation between scores on measures of test anxiety and GPA in students in upper elementary and middle school grades. They also found that GPA was more strongly correlated with the worry component of test anxiety than the emotionality component. Past research has suggested that GPA may be related to test anxiety through its relation with academic self-concept. Other research has suggested that the relation between GPA and test anxiety may be representative of the presence of perfectionism, either adaptive or maladaptive, especially in test-anxious females (Eum & Rice, 2011).

Perceived Threat of Tests. Students who are high in test anxiety are more likely than their low test-anxious peers to perceive tests as threatening (Veenstra et al., 2006). Evaluative situations are threatening to some students in that they are perceived as stressful events that cause the student harm in some way (impact on grades, self-esteem, status, disappointment to teachers or parents, etc.). Other research revealed that students who felt threatened by the testing situation expressed feelings of anger, fear, and isolation, and that they worried about consequences of failing such as grade retention or having to attend summer school (Triplett & Barksdale, 2005). Cross-cultural studies by Cassady and colleagues revealed that perceived test threat is much more prevalent in highly competitive societies like the U.S., and is practically absent in collectivist social structure societies where success is guaranteed to all students (Cassady, Mohammed, & Mathieu, 2004). Perception of the test situation as threatening impacts performance generally through feelings of helplessness and avoidant behavior during the test preparation phase.

Contextual Factors Included in the Current Study

Unrealistic Parental Expectations. Sarason and colleagues hypothesized that test-anxious reactions in children developed from negative experiences with evaluative situations in the home that occurred both before and after the beginning of formal schooling. Furthermore, they hypothesized that the test-anxious response has unconscious meanings related to certain types of parent-child relationships (Birenbaum, 2007). In the early 1960s, they suggested that the test-anxious reaction resulted from the complex interaction between the “parental threat of negative evaluation of the child’s performance and the child’s conflicting feelings of aggression toward his parents and his needs to be dependent upon them” (Sarason et al., 1960, p. 190).

A more recent view of the way in which parent-child relationships affect the development or manifestation of test anxiety is via parents’ expectations for their children’s achievement. In general, parent support for achievement (in moderation) facilitates achievement in children. When parents’ expectations for achievement are unrealistically high however, it creates pressure and fosters performance anxiety in children (Lapointe et al., 2005). Ablard and Parker (1997) also found that unrealistic parental expectations for achievement foster perfectionism and performance or test anxiety in their children. Children whose parents’ goals for achievement focus on high performance, rather than learning for understanding, are significantly more likely to report dysfunctional perfectionism, concern over making mistakes, and overall performance anxiety (Ablard & Parker, 1997). Children who are high achievers without exhibiting perfectionistic and performance-anxious behaviors typically have parents who emphasize the importance of academic achievement, but do not demand high

performance just for the sake of appearing competent in front of others, especially if it involves the risk of anxiety (Ablard & Parker, 1997). Putwain and colleagues (2010) found that parental pressure was related to test anxiety in two ways: directly, through worry about parental response to failure during the actual testing situation, and indirectly, through the development of performance oriented goals.

School Climate. There is a growing realization of the importance of the social environment of the educational setting and its impact on student outcomes in both the academic and behavioral domains. Comprehensive literature reviews conducted as early as the 1980s indicated that students' perceptions of the classroom environment account for significant amounts of variance in learning outcomes (Fraser, 1984). Early research on classroom climate conducted in the 1970s and 1980s focused mainly on specific characteristics of individual classrooms. Much of the research conducted during this time was based on the conceptualization of classroom climate as consisting of several broad factors such as cohesion or friction between students, level of support or responsiveness of teachers, and level of competitiveness within the classroom (Fraser & Rentoul, 1982). The hypothesized ideal classroom climate would include high levels of satisfaction, teacher responsiveness, and student cohesiveness, accompanied by low levels of friction and competitiveness.

Much of the early research on psychosocial climate of the educational setting focused on characteristics of individual classrooms. While this is an appropriate way to measure climate at the elementary level where children spend the majority of their day with the same teacher and peer group, it is not as functional at a middle school or high school level. Students in secondary schools typically move from class to class

throughout the day, encountering a different teacher and different peer group in each class. This results in students being exposed to a broad range of expectations, rules, and routines across different class periods, and also opportunities for interaction with a wider range of other students. This necessitates a different approach to measuring climate of the educational setting, as it introduces variables that may not be as salient or relevant at the elementary level. Brand and colleagues (2003), with the development of a school-level (rather than classroom-level) measure of climate, broadened the range of characteristics to be assessed when evaluating school climate. Their instrument includes subscales measuring teacher support, consistency and clarity of rules and expectations, student commitment/achievement orientation, negative peer interactions, positive peer interactions, disciplinary harshness, student input in decision making, instructional innovation and relevance, support for cultural pluralism, and safety problems (Brand et al., 2003).

Since the early meta-analyses of school climate literature, psychosocial characteristics of the classroom have been found to be related to student outcomes even when ability level is controlled. Satisfaction and cohesiveness were found to be related to higher performance on measures of student learning in a broad range of content areas (Fraser & O'Brien, 1985). Brand and colleagues (2003) found that among middle and high school students, aspects of school climate accounted for a significant proportion of between-schools variance on reading and math scores on state level standardized tests. School climate is also significantly correlated with grade point average, academic aspirations, academic efficacy, and teachers' ratings of students' academic potential (Brand et al., 2003; Tanzer, 1990). School and classroom climates have consistently

been found to be directly related to achievement measures of language, reading, and math, and have also been found to moderate the negative effects of children's disruptive behavior on academic achievement (Posner & Rothbart, 1998).

Factors of school climate are also related to whether students generally pursue learning/mastery goals or performance goals. Students who are in classrooms or schools that are task-focused rather than ability-focused, and measure success by self-improvement or individual progress rather than between-student comparisons, are more likely to display learning or mastery goals (Hardré, Crowson, Debacker, & White, 2007). The same body of research shows that in contrast, students who are in educational settings with high levels of competition are more likely to pursue performance goals (either performance-approach or performance-avoidance goals, depending on perceived ability level). Similarly, climates which valued task goals predicted students' academic self-efficacy, which then predicted achievement goals and performance (Greene, 2005). Student perceptions of classroom climate have also been found to have significant effects on motivation, especially when examining dimensions of climate related to relationships among peers (Tanzer, 1990).

Another important factor related to academic achievement that has been shown to be affected by school climate is engagement in learning. Engagement in learning has both cognitive and emotional components, including but not limited to participation in class, paying attention during instruction, and willingness to approach complex tasks. Differences between schools or classrooms on climate dimensions create different levels of behavioral and academic demands on children, which are significantly related to levels of behavioral engagement among students (Putnam & Stifter, 2008). For children at risk

for school problems, high quality classroom climate moderates the relationship with negative outcomes, largely through its impact on engagement in learning (Putnam & Stifter, 2008). The impact of school climate on engagement in learning was found to be particularly salient among adolescents, especially at the middle or junior high school stage. Additionally, self-regulation is another variable that has been found to be related to behavioral engagement and is affected by exposure to positive school climate (Posner & Rothbart, 1998; Triplett & Barksdale, 2005).

School climate has also been found to be significantly related to absenteeism and eventual dropout (Kearney, 2008). The degree to which students perceive themselves as being safe, valued, and respected at school is a key aspect of school connectedness, which is negatively related to frequency of absences and dropout. Kearney suggests that one contributing factor is that positive school climate results in lower levels of victimization by peers and staff, which leads to lower frequency of student absenteeism due to fear of school violence. Also, poor school climate can be linked to harsh disciplinary practices, poor student-teacher relationships, and inattention to issues of cultural diversity, all of which are related to increased risk of student drop-out. Students who are in schools perceived to have challenging courses, high level of cohesion among students, and positive relationships with teacher are less likely to drop out of school (Kearney, 2008).

School climate has also been shown to be related to a number of emotional and behavioral outcomes, especially in adolescents. In general, school climate has been shown to be significantly related to overall social competence (Triplett & Barksdale, 2005). School climate, particularly level of negative peer interactions, has been shown to

account for a significant proportion of between-schools variance in overall delinquency. Other school climate dimensions (in addition to negative peer interaction) including low levels of teacher support, student commitment to achievement, and safety problems, were found to be significantly correlated with substance use attitudes and behavior, including smoking, drinking, and drug use (Brand et al., 2003). Schools with high levels of the school climate dimensions of teacher support, commitment to achievement, and positive peer interaction were found in the same research to be predictive of higher levels of self-esteem and lower levels of depression (Brand et al., 2003). Significant relations have also been found between climate and anxiety, as well as between climate and behavioral disengagement (Marsh, Martin, & Cheng, 2008). Tanzer (1990) found in earlier school climate research significant relations between school-level climate and both test anxiety and alienation; specifically, that high quality interactions among students and between students and teachers was related to the lowest levels of test anxiety and self-reported feelings of alienation. In addition, school climate has been shown to mediate the relation between community poverty and school disorder, as measured by frequency of behavioral incidents (Seipp, 1991). School climate has also been shown to have a moderating effect on the relation between low levels of effortful control with conduct problems and depression (Cohen et al., 2008; Loukas & Robinson, 2004).

Certain aspects of school climate, namely teacher support, student input in decision making, and competitiveness, have been found to directly relate to test anxiety. LaPointe, Legault, and Batiste (2005) found an increase in test anxiety in math after the transition to middle school, when the perceived level of teacher support decreases. This effect was especially strong among students identified as academically talented.

Additionally, lower levels of test anxiety have been found among students who reported that their instructors considered their input in assessment type (multiple choice, essay, short answer, etc.) (Birenbaum, 2007). Additionally, levels of test anxiety were higher among students who moved from average ability to high-ability classes, where they perceived higher levels of competition among peers (Preckel, Zeidner, Goetz, & Schleyer, 2008; Zeidner & Schleyer, 1998).

Summary

The purpose of the current study was to utilize a developmental systems perspective to gain a more comprehensive understanding of the relationships among factors that contribute to test anxiety in adolescents. Variables including academic performance, self-concept, expectations of parents, social-emotional functioning including a tendency toward anxiety, and students' perceptions of the testing situation have all been shown in past research to be individually related to test anxiety. In the current study, it was expected that the factors that would most strongly predict high levels of test anxiety were low level of effortful control, poor academic self-concept, perception of test situations as threatening, unrealistically high parental expectations, and poor quality school climate. The current study was intended to provide a better understanding of the way in which the combination of the above-mentioned factors explains variance in adolescent test anxiety beyond what can be explained by the individual or contextual variables alone. It also contributes to the existing test anxiety literature by examining the potential moderating role of school climate on the above-mentioned variables.

CHAPTER III

METHOD

Participants

The participants in this study included 297 students in seventh and eighth grade who attend a public middle school in a suburb of a major metropolitan area in the Midwestern United States. The sample included seventh and eighth grade students from required core academic general and special education classes. All students in those required courses were asked to participate. Students were excluded only if their parents did not allow their participation or if students themselves chose not to be involved in the study. A total of 10 parents responded indicating that they did not want their child to participate in the study, either by returning the Parental School Information Sheets, or contacting the Principal Investigator via telephone or e-mail. See Table 1 for the frequency distributions of demographic characteristics of participating students.

Table 1

Frequency Distributions – Demographic Characteristics of the Student Participants

Demographic Characteristics (n = 297)	Number	Percent
Gender		
Male	165	55.6
Female	132	44.4
Ethnicity		
African American/Black	31	10.4
Asian/Pacific Islander	4	1.3
Caucasian	209	70.4
Hispanic	8	2.7
Middle Eastern	5	1.7
Other (primarily multi-racial)	40	13.5
Grade		
7 th	120	40.4
8 th	177	59.6
Self-reported high school grade point averages		
4.0 or higher (All A's)	31	10.4
3.75 to 3.99 (Mostly A's)	68	22.9
3.5 to 3.74 (More A's than B's)	48	16.2
3.25 to 3.49 (More B's than A's)	34	11.4
3.0 to 3.24 (Mostly B's, Some A's and C's)	63	21.2
2.5 to 2.99 (More B's than C's)	13	4.4
2.0 to 2.49 (More C's than B's)	18	6.1
1.5 to 1.99 (More C's than D's)	13	4.4
1.0 to 1.49 (More D's than C's)	7	2.4
Less than 1.0 (Mostly D's and F's)	2	0.7

Measures

A demographic survey was administered to all student participants. All participants also completed self-report measures of the following seven constructs: Test anxiety, effortful control, school climate, parental expectations, academic self-concept, academic performance (measured by grade point average), and perceived threat of testing

in school. Copies of all measures are included in Appendix A. Internal consistency reliability coefficients are reported in Table 2.

Table 2

Cronbach Alpha Coefficients – Scaled Variables

Scale and Subscales	α Coefficient
Cognitive Test Anxiety	.95
Early Adolescent Temperament Questionnaire-Revised Effortful Control	.81
Inventory of School Climate	.89
Unrealistic Parental Expectations	.90
School Attitude Assessment Survey-Revised Academic Self-Perceptions	.93
Perceived Threat of Tests	.81

Demographics. A demographic questionnaire was developed specifically for this study. Questions about variables such as age, gender, ethnicity, and school grade were included.

Test anxiety. Test anxiety was measured using the Cognitive Test Anxiety scale (CTA; Cassidy and Johnson, 2002). The CTA consists of 27 items and students were asked to report, using a four-point Likert scale, how frequently they experience the specific symptoms of anxiety, ranging from “Not at all typical of me” to “Very typical of me.” The CTA assesses the cognitive domain of test anxiety, referred to as *worry* in

Liebert and Morris' model, and reflects the tendency before or during examination situations to engage in task-irrelevant thinking, compare self to others, experience intruding thoughts, and have relevant cues escape attention (e.g., "During tests, I find myself thinking of the consequences of failing" and "During a course examination, I get so nervous that I forget facts I really know") (Cassady, 2004). One overall Cognitive Test Anxiety score was derived, with a higher score reflecting a higher level of anxiety.

The CTA scale was developed by Cassady and Johnson (2002) with the intent of focusing specifically on the cognitive, or *worry*, aspect of test anxiety, which is unlike previous measures of test anxiety that contain items measuring both the Worry and Emotionality domains. The authors chose to isolate only the cognitive aspect of test anxiety because it has been found to be a stronger predictor of performance than measures containing both components. This measure also differs from measures of test anxiety that preceded it in that it includes questions related to interference during the test preparation phase. Internal reliability of the overall scale is high ($\alpha = .91$). In the current sample, the Cronbach alpha was $r = 0.95$. This is determined to be a reliable instrument.

The CTA has also shown strong construct validity. High correlations were found between the CTA, Sarason's Reactions to Tests (1984), and Spielberger's Test Anxiety Inventory (1980) (Cassady & Johnson, 2002). The authors also found that scores from the CTA more strongly predicted test performance than Sarason's Reactions to Tests measure. In the same study, higher levels of test anxiety as measured by the CTA were associated with significantly lower scores on course examinations as well as on the Scholastic Aptitude Test (SAT).

Effortful control. Effortful control was measured using the Early Adolescent Temperament Questionnaire Revised (EATQ-R; Ellis & Rothbart, 2001). Factor analyses conducted by Rothbart and colleagues showed that the subscales of Attention, Activation Control, and Inhibitory Control constitute an effortful control scale (Putnam, Ellis, & Rothbart, 2001). This effortful control scale contains a total of sixteen items among the three subscales. Attention measures the capacity to focus attention as well as to shift attention when desired (e.g., “I am good at keeping track of several different things that are happening around me,” “I tend to get in the middle of one thing, then go off and do something else” [reverse scored]). Activation Control measures the capacity to perform an action when there is a strong tendency to avoid it (e.g., “I have a hard time finishing things on time,” “I do something fun for awhile before starting my homework, even when I’m not supposed to” [reverse scored]). Inhibitory control measures the capacity to plan and to suppress inappropriate responses (e.g., “It’s easy for me to keep a secret,” “I can stick with my plans and goals”). Items were scored on a five point Likert scale, ranging from 1 (*almost always untrue*) to 5 (*almost always true*). A total score was calculated, with higher scores reflecting higher levels of effortful control.

The EATQ-R was designed by Ellis and Rothbart (2001) as a revision and expansion of the EATQ developed in 1992 (Capaldi & Rothbart, 1992). Cronbach’s alpha for the Effortful Control Scale (comprised of the Attention, Activation, and Inhibitory Control scales) is high ($\alpha=.86$) (Veenstra et al., 2006). Whittle and colleagues found moderately high test-retest reliability of the Effortful Control Scale for a six month to one year period ($r=.42$ - $.66$), which is consistent with Rothbart’s conceptualization of

temperament traits as relatively stable over time (Whittle et al., 2008). In the current sample, the Cronbach alpha was $r = 0.81$. This is determined to be a reliable instrument.

The EATQ-R has been shown to have good construct validity. Correlations of the scales with existing measures of personality were conducted to assess convergent validity. As expected, the Attention and Inhibitory Control subscales were positively related to measures of Gray's Behavior Inhibition System ($r = .25$ and $.53$ respectively) and negatively related to measures of the Behavior Activation System ($r = .26$ and $.31$ respectively) (Muris & Meesters, 2009). Convergent validity was also demonstrated through significant correlations found between the Effortful Control scale and measures of various types of psychopathological symptoms. The strongest correlation was found between the effortful control and hyperactivity/inattention problems from the Strengths and Difficulties Questionnaire (SDQ) ($r = .44$ $-.58$). Prosocial behavior from the SDQ was also positively associated with aspects of effortful control ($r = .22$ $-.39$) (Muris & Meesters, 2009).

School climate. Student-perceived school climate was measured using the Inventory of School Climate-Student (ISC-S; Brand et al., 2003). The ISC-S is a 50-item self-report measure that assesses students' perceptions of school climate using 10 subscales. For the purpose of this study, eight of the ten subscales were used: Teacher Support (e.g., "Teachers go out of their way to help students"), Consistency and Clarity of Rules and Expectations (e.g., "If some students are acting up in class the teacher will do something about it"), Student Commitment/Achievement Orientation (e.g., "Students work hard for good grades in classes"), Negative Peer Interactions (e.g., "Students in this school have trouble getting along with each other"), Positive Peer Interactions (e.g.,

“Students enjoy working together on projects in classes”), Disciplinary Harshness (e.g., “The rules in this school are too strict”), Student Input in Decision Making (e.g., “In our school, students are given the chance to help make decisions”), and Instructional Innovations/Relevance (e.g., “New and different ways of teacher in tried in class”; Brand et al., 2003). Items were scored using a four-point Likert-type scale, with responses ranging from “Never” to “Always,” with higher overall scores reflecting a more positive school climate.

The ISC-S was developed by Brand and colleagues to address the need for a school-wide rather than classroom-level measure of school climate to use with middle school, junior high, and high school students. Because secondary students typically change classes throughout the day, they encounter a changing set of peers, fluctuations in classroom style and expectations, and shorter periods of contact with each teacher. This invalidates the use of many of the existing classroom-level measures of school climate with secondary students. The ISC-S has shown moderate to high levels of internal consistency, with coefficient alpha ranging from .63 (Instructional Innovation/Relevance) to .81 (Student Commitment; Brand et al., 2003). Test-retest reliability was moderate for a one year interval (Grade 6 median $r = .56$, Grade 7 median $r = .63$, and Grade 8 median $r = .53$; Brand et al., 2003). In the current sample, the Cronbach alpha was $r = 0.89$. This is determined to be a reliable instrument.

The ISC-S has also shown good construct validity. In the validation study, school-level scores on the ISC-S accounted for 10% or more of the variance between schools on measures of academic and behavioral adjustment (Brand et al., 2003). After controlling for effects of school-level differences in SES, the dimensions of school

climate measured by the ISC-S were found to be related to academic achievement (Student Commitment/Achievement Orientation subscale), behavior problems (Negative Peer Interactions subscale), substance use (Teacher Support and Student Commitment /Achievement Orientation subscales), and socioemotional adjustment such as self-esteem and depression (Teacher Support, Student Commitment/Achievement Orientation, and Positive Peer Interaction subscales; Brand et al., 2003).

Unrealistic parental expectations. Parental expectations for student achievement were measured using an instrument designed specifically for this study (Unrealistic Parental Expectations). An existing measure was used as a starting point, and additional items were created to better target the specific construct of interest in this study. The existing measure was the five-item Parental Expectations subscale of the Multidimensional Perfectionism Scale (MPS; Frost, Marten, Lahart, & Rosenblate, 1990). The Multidimensional Perfectionism Scale is a 35-item self-report measure that includes six subscales for assessing different components of perfectionism: Concern Over Mistakes, Personal Standards, Parental Criticism, Doubts About Actions, Organization, and Parental Expectations. The Parental Expectations subscale, which was used in the current study, contains five items and represents the tendency to believe that one's parents set very high goals for them (e.g., "Only outstanding performance is good enough in my family" and "My parents have expected excellence from me.")

The MPS was designed by Frost and colleagues to measure all five of the dimensions of perfectionism that had been previously identified in the research. Cronbach's alpha for the total perfectionism scale was .90. Overall, the subscales measuring the different dimensions of perfectionism were highly correlated with one

another, with the exception of the Organization subscale. Specifically, the internal reliability coefficient for the Parental Expectations subscale was .84 (Frost et al, 1990).

The MPS was shown to have strong construct validity. In order to assess convergent validity, correlations were obtained between MPS scores and scores from three other scales measuring perfectionism: the Burns' Perfectionism Scale ($r = .85$), the Self-Evaluative Scale from the Irrational Beliefs Test ($r = .57$), and the Perfectionism Scale from the Eating Disorder Inventory ($r = .59$) (Frost et al, 1990). Specifically, a moderate correlation was found between the Parental Expectations subscale of the MPS and the overall score from the Burns' Perfectionism Scale ($r = .43$) (Frost et al, 1990). The MPS in general, and the Parental Expectations subscale in particular, was also shown to have predictive validity. A significant correlation was found between the Parental Expectations subscale and the Brief Symptom Inventors (BSI), Intensity of Symptoms subscale (PSDI), which is a general measure of psychopathology and psychiatric symptoms ($r = .30, p < .01$) (Frost et al, 1990). Further construct validity was shown through correlations between the MPS Parental Expectations subscale and the Frequency of Procrastination, Fear of Failure, and Task Aversiveness, as measured by the Procrastination Assessment Scale ($r = .210, p < .05$; $r = .197, p < .05$; and $r = .272, p < .01$) (Frost et al., 1990).

The Parental Expectations subscale was used as a starting place for the development of the measure used in this study because of its strong psychometric properties. However, the goal of the current study was to target excessively high parental expectations. The construct hypothesized to be related to test anxiety was parents' unrealistic expectations, such as perfection in performance regardless of a child's ability

level, that are likely to foster a performance goal orientation. For this reason, ten additional questions were developed, some based on items from the Patterns of Adaptive Learning Scales (Midgley et al., 2000), that at face validity appeared to measure Unrealistic Parental Expectations as intended for this study. Other items were created using face validity principles in attempting to target this unique construct. These ten items plus the five items from the MPS were entered into a principal component factor analysis in order to identify which items significantly comprised a unidimensional construct. Based on the results, a total of four items were eliminated because they did not contribute to a single-factor structure and failed to meet a minimum criteria of having a primary factor loading of .4 or above. The following item from the MPS was eliminated: 1. "My parents set very high standards for me." The following items of the author's creation were also eliminated: 13. "My parents would like me to do challenging school work, even if I make mistakes," 14. "My parents want me to understand my school work, not just memorize how to do it," and 15. "My parents want me to see how my class work relates to things outside of school." A principal component factor analysis of the remaining 11 items was conducted, with the single factor explaining 50.71% of the variance. All items had primary loadings over .50. The factor loading matrix for this final solution is presented in Table 3. Cronbach's alpha for the final revised scale was $r = 0.90$. This is determined to be a reliable instrument.

Table 3

Factor Loadings for Principal Component Analysis of Unrealistic Parental Expectations measure

Item	Unrealistic Parental Expectations
My parents want me to get perfect scores on tests, even if I don't understand the material.	.82
Even when I try my hardest, my parents still think I could have done better.	.77
My parents are disappointed in me if my performance in school is not perfect.	.77
My parents expect me to never make mistakes in school.	.77
It's very important to my parents that others think I'm smart.	.75
Only outstanding performance is good enough in my family.	.75
My parents expect me to get better grades than I am capable of.	.71
My parents think the most important thing is for me to show others how good I am in school.	.70
My parents have always had higher expectations for my future than I have.	.65
My parents want me to be the best at everything.	.52
My parents have expected excellence from me.	.52

Note. Cronbach's alpha for final scale (11 items) = .90

Academic self-concept. Academic self-concept was measured using the Academic Self-Perceptions subscale from the School Attitude Assessment Survey-Revised (SAAS-R; McCoach, 2002). The SAAS-R is a 35-item self report measure used

to determine adolescents' attitudes toward school, attitudes toward teachers, goal-valuation, motivation, and general academic self-perceptions. The Self-Perceptions subscale of the SAAS-R consists of seven items and students were asked to report how they perceive their own level of academic ability (e.g., "I can learn new ideas quickly in school," and "School is easy for me."). Items were scored using a seven-point Likert scale, with responses ranging from "Strongly Agree" to "Strongly Disagree."

The SAAS-R was designed by McCoach (2002) as a revision and expansion of the same author's original School Attitude Assessment Survey. One of the goals of the revision was to revise the SAAS to strengthen the psychometric properties through the removal of one factor and the addition of two new factors (the Academic Self-Perceptions subscale was retained from the original measure). Internal consistency reliability coefficients for each of the five factors are greater than .85. Cronbach's alpha for the Academic Self-Perception subscale specifically is .855 (McCoach, 2002). In the current sample, the Cronbach alpha was $r = 0.93$. This is determined to be a reliable instrument.

The SAAS-R demonstrates good construct and criterion-related validity. Confirmatory factor analysis indicated that each of the items is an indicator for only one of the five factors. All factor pattern coefficients were significantly different from zero and in the proper direction, and ranged from .582 to .802 on the Academic Self-Perception subscale items. Criterion-related validity was demonstrated through the ability of the SAAS-R to distinguish academically capable achievers from academically capable underachievers (McCoach, 2002).

Academic performance. Academic performance was measured using self-reported grade point averages (GPA). Students were asked to report their GPA by answering the question, “What is your cumulative GPA? What are your average grades?” with the following response options: 4.0 or higher (All As); 3.75-3.99 (Mostly As); 3.5-3.74 (More As than Bs); 3.25-3.49 (More Bs than As); 3.0-3.24 (Mostly B’s with some As and Cs); 2.5-2.99 (More Bs than Cs); 2.0-2.49 (More Cs than Bs); 1.5-1.99 (More Cs than Ds); 1.0-1.49 (More Ds than Cs); Less than 1.0 (Mostly Ds and Fs). Responses were coded as 1 (All As) through 10 (Mostly Ds and Fs). The reverse-coded GPA was used for statistical analysis, with a higher code representing a higher GPA.

Students’ perceived threat of testing. Students’ perception of the level of threat of the testing situation in the school was measured using the Perceived Threat of Tests questionnaire (Cassady, 2004). The Perceived Threat of Tests questionnaire is an 18 item measure that assesses a student’s perception of tests as threatening (e.g., “This is a very important test to my GPA,” “This test is nothing to get too concerned about”). The questions were modified slightly for the current study, to reflect how the students feel in general about tests given in their core academic classes, rather than focusing their responses on a single upcoming test. The responses are scored using a four-point Likert-type scale, ranging from “Strongly Disagree” to “Strongly Agree.” Selected items were reverse coded, so that high overall scores reflect high levels of perceived threat.

The Perceived Threat of Tests questionnaire was designed by Cassady in 2004, for use in a study examining the influence of cognitive test anxiety across the learning-testing cycle. The measure has strong internal consistency, with Cronbach’s alpha of

0.85 (Cassady, 2004). In the current sample, the Cronbach alpha was $r = 0.81$. This is determined to be a reliable instrument.

Procedure

Approximately two weeks prior to the data collection day, a Parental School Information Sheet detailing the study (i.e., the purpose, procedure, risks and benefits, confidentiality, and researcher contact information) was mailed home to all of the parents of the students in the participating middle school. Parents had the opportunity to refuse their child's participation by returning the information sheet to the principal investigator with a parent signature, or by contacting the principal investigator directly via telephone or e-mail. The principal investigator's e-mail address and phone number were provided on the information sheet for parents and guardians who wished to learn more about the study. Copies of all measures were available in the school's office for parents to review. Participation in the study was strictly voluntary.

On the day of administration, the principal investigator and her research assistants provided an introduction to the study and information sheet to each student. The information sheet was also read aloud to each class to ensure their understanding of the study. The principal investigator made clear that each student's participation was strictly voluntary, even if his or her parents gave permission, and that his or her teachers would not have access to completed questionnaires. Participating students were reminded that all information would be anonymous and that they were not to write their names anywhere on the questionnaires. They were also informed that they were allowed to refuse to answer any individual questions or discontinue participation completely at any

time. Students interested in participating were then asked to complete a behavioral assent form indicating voluntary participation in the study.

Interested students whose parents did not decline their participation were then asked to complete a packet of questionnaires (Appendix A) during the class period. Questionnaire completion took approximately 25-30 minutes and was completed during one meeting. Students who chose not to participate were asked to work quietly on an activity of their choice (finish homework, read a book, etc.). The principal investigator and research assistants distributed the packets containing the assent form, demographic form, and questionnaires (CTA, EATQ-R, SAAS-R, etc). Students were directed to complete the questionnaires independently and honestly, and then directions for completing the packet were read aloud by the investigator and assistants. The principal investigator answered any questions that arose by participating students.

Participating students were encouraged to cover their answers as they completed the questionnaires in an effort to support honest responding. They were also provided with individual manila envelopes with no identifiers on them, and instructed to place their completed survey in the envelope before turning it in, so that neither peers nor investigators could identify individual responses. Upon turning in the completed packet, students were offered a choice of candy bars and were also entered into a raffle-style drawing to win store gift cards.

Statistical Analyses

The questionnaire data was analyzed using IBM SPSS Statistics, Version 19 (SPSS 19). See Table 4 for descriptions of the types of analyses that were conducted for each research question.

Table 4

Statistical Analysis

Hypothesis	Variables	Statistical Analysis
Research question 1: How well do the individual intrapersonal variables (effortful control, academic performance, academic self-concept, and perceived threat of tests) explain the variance in levels of self-reported test anxiety, after controlling for the hypothesized mediation effect of academic self-concept on GPA? Among these variables, what is the relative contribution of each in explaining the variance in test anxiety?		
<p>H_{1A}: The relation between GPA and test anxiety is mediated by academic self-concept</p> <p>H_{1B}: The intrapersonal variables of effortful control, academic performance, academic self-concept, and perceived threat of tests will significantly explain the variance in test anxiety.</p> <p>H_{1C}: Students low in effortful control, especially those with poor academic performance, poor academic self-concept, and a high level of perceived threat of tests will display the highest levels of test anxiety.</p>	<p><u>Criterion Variable</u> Test anxiety</p> <p><u>Predictor Variables</u> Effortful control Academic performance (GPA) Perceived threat of tests</p> <p><u>Mediating Variable</u> Academic self-concept Note. Mediating GPA only</p>	Hierarchical Regression Analysis
Hypothesis	Variables	Statistical Analysis
Research question 2: How well do the contextual or environmental variables (unrealistic parental expectations and school climate) explain the variance in levels of self-reported test anxiety? Among these variables, what is the relative contribution of each in explaining the variance in test anxiety?		
<p>H_{2A}: The contextual variables of unrealistic parental expectations and school climate will significantly explain the variance in test anxiety.</p> <p>H_{2B}: Students with unrealistic parental expectations who are in a more negative school climate will display the highest levels of test anxiety.</p>	<p><u>Criterion Variable</u> Test anxiety</p> <p><u>Predictor Variables</u> Unrealistic parental expectations School climate</p>	Hierarchical Regression Analysis

Research question 3: What is the combined role of the intrapersonal and contextual variables, with school climate as a moderator, in explaining a statistically significant proportion of variance in self-reported levels of test anxiety?		
<p>H_{3A}: Regression analysis will indicate that the predictor variables significantly predict test anxiety.</p> <p>H_{3B}: Positive school climate will moderate the relation of effortful control with test anxiety.</p>	<p><u>Criterion Variable</u> Test anxiety</p> <p><u>Predictor Variables</u> Effortful control Academic self-concept Perceived threat of tests Unrealistic parental expectations</p> <p><u>Moderating Variable</u> School climate</p>	Hierarchical Regression Analysis

CHAPTER IV

RESULTS

This chapter presents results of the data analyses that were used to address each of the research questions posed for this study. The purpose of the study was to determine the relations between both intrapersonal and contextual factors and test anxiety, as well as the role of school climate as a potential moderator. Test Anxiety is defined in this study as “individuals’ cognitive reactions to evaluative situations, or internal dialogue regarding evaluative situations, in the times prior to, during, and after evaluative tasks” (Cassady & Johnson, 2002, p. 272). Three research questions are addressed in this chapter. Inferential statistical analyses were used to test the research questions, with statistical significance determined using a criterion alpha level of .05. See Table 5 for the descriptive statistics for both males and females. See Table 6 for the intercorrelation matrix.

Table 5

Descriptive Statistics

Females (N =132)	Number	Mean	SD	Range	
				Minimum	Maximum
Academic Performance (GPA)	132	3.5 ^a	2.10 ^a	1	10
Cognitive Test Anxiety	132	52.70	17.97	25	100
Effortful Control	130	54.13	10.66	21	78
School Climate	131	123.56	16.59	66	160
Parental Expectations	131	40.59	8.84	19	60
Academic Self-Concept	131	35.27	9.87	7	49
Perceived Threat of Tests	127	52.46	10.17	30	84
Males (N = 165)					
Academic Performance (GPA)	165	4.19 ^a	2.09 ^a	1	10
Cognitive Test Anxiety	165	47.52	16.39	25	100
Effortful Control	161	55.27	9.86	32	80
School Climate	162	125.04	18.77	64	170
Parental Expectations	164	42.52	7.61	26	59
Academic Self-Concept	163	38.17	8.15	10	49
Perceived Threat of Tests	162	49.47	9.85	20	83

^aGPA values represent coded values as used on the measure. Codes are as follows: 1= 4.0, 2=3.75-3.99, 3=3.5-3.74, 4=3.25-3.49, 5=3.0-3.24, 6=2.5-2.99, 7=2.0-2.49, 8=1.5-1.99, 9=1.0-1.49, 10=less than 1.0

Table 6

Intercorrelation Matrix for All Study Variables (n=297)

	GPA	Test Anxiety	Effortful Control	School Climate	Parental Expectations	Academic Self-Concept	Perceived Threat of Tests
GPA	---						
Test Anxiety	-.31**	---					
Effortful Control	.42**	-.51**	---				
School Climate	.04	-.15*	.34**	---			
Parental Expectations	-.08	.18**	-.24**	-.15**	---		
Academic Self-Concept	.58**	-.51**	.51**	.18**	-.05	---	
Perceived Threat of Tests	-.40**	.63**	-.38**	-.10	.16**	-.53**	---

Note. ** $p < .01$, * $p < .05$

First, several preliminary analyses were conducted. A one-way Analysis of Variance (ANOVA) was run to examine whether the variable of Test Anxiety differed by gender. Because of the unequal number of males and females, a test of the underlying assumption of homogeneity of variance was run ($F(1, 295) = 2.19, p = .14$). This test was not statistically significant, indicating that the assumption was not violated. There was a small but statistically significant difference found in test anxiety by gender as determined by the one-way ANOVA ($F(2,295) = 6.727, p = .01$). The results are included in Table 7. Significant gender differences were found for test anxiety. Therefore, gender was included as a predictor variable in the main analyses.

Table 7

Analyses of Variance for Test Anxiety by Gender

	Sum of Squares	df	Mean Square	F
Between Groups	1969.09	1	1969.09	6.73**
Within Groups	86347.09	296	292.70	
Total	88316.18	296		

** $p < 0.01$

Research Question 1: How well do the individual intrapersonal variables (Effortful control, Academic performance, Academic self-concept, and Perceived threat of tests) explain the variance in levels of self-reported test anxiety, after controlling for the hypothesized mediation effect of academic self-concept on GPA? Among these variables, what is the relative contribution of each in explaining the variance in test anxiety?

First, a mediation analysis was conducted to determine whether the relation between academic performance (GPA) and test anxiety was mediated by academic self-concept. This potential relation was tested using Baron and Kenny's mediation model, which suggests that a mediating variable is the mechanism by which one variable affects another (Baron & Kenny, 1986). Full mediation occurs when the predictor variable loses its significance to the criterion after controlling for the mediating variable. The mediation process recommended by Baron and Kenny (1986) was used in this analysis.

Results indicated that academic self-concept fully mediated the relation between academic performance (GPA) and test anxiety. On the first step of the mediation analysis, academic performance was entered as the predictor variable and test anxiety was entered as the criterion variable. The outcome was statistically significant ($\beta = -.31$, $p < .001$). On the second step, academic performance (GPA) was entered as the predictor variable, with academic self-concept as the criterion variable. The outcome of step two was also statistically significant ($\beta = .58$, $p < .001$). On the third step of the analysis, academic self-concept was entered as the predictor and test anxiety as the criterion, and the result of the regression analysis was statistically significant ($\beta = -.51$, $p < .001$). On the fourth step, after holding the mediating variable (academic self-concept) constant, the relation between academic performance (GPA) and test anxiety was re-examined. The result of this step was not significant ($\beta = -.03$, $p = .610$). This indicates that academic self-concept was a full mediator for the relation between academic performance and academic achievement. Table 8 presents results for this analysis.

Table 8

*Mediation Analysis**Academic performance (GPA) and Test anxiety as Mediated by Academic self-concept*

Predictor	Criterion	R ²	F	β
Step 1				
Academic performance	Test anxiety	.10	31.82***	-.31***
Step 2				
Academic performance	Academic self-concept	.33	144.85***	.58***
Step 3				
Academic self-concept	Test anxiety	.26	104.21***	-.51***
Step 4				
Academic self-concept	Test anxiety	.26	104.21***	-.50***
Academic performance		.26	52.10**	-.03

Note. *** $p < .001$; ** $p < .01$; * $p < .05$

Second, hierarchical regression analysis was used to test whether the intrapersonal variables significantly predicted students' level of test anxiety. In order to control for gender, it was entered first as a predictor. Next, the variables of effortful control, perceived threat of tests, and academic self-concept were entered simultaneously as predictors. Academic performance was not included as a predictor in this analysis since it was found to have been fully mediated by academic self-concept. The results of the analysis indicated that the combination of the three predictors explained 52% of the variance ($R^2 = .52$, $F(4,278) = 75.17$, $p < .001$). Each of the three variables - effortful control ($\beta = -.264$, $p < .001$), perceived threat of tests ($\beta = .44$, $p < .001$), and academic

self-concept ($\beta = -.18, p < .001$) - significantly contributed to the model. See Table 9 for results.

Table 9

Hierarchical Regression Analysis

Intrapersonal variables on Test Anxiety

Predictor	B	SE B	β	t	p
Perceived threat of tests	.74	.08	.44	8.86	.000
Effortful control	-.44	.08	-.26	-5.38	.000
Academic self-concept	-.33	.10	-.18	-3.25	.001

Note. $R^2 = .520, (F = 75.17, df = 4, 282)$

A second hierarchical regression analysis was then conducted, with perceived threat of tests entered first, effortful control entered second, and academic self-concept entered third, to determine the relative contribution of each variable. The variables were entered in this order based on past research regarding the strength of these factors as predictors, and on the correlations obtained in preliminary analyses in the current study. These results indicated that perceived threat of tests explained 39% of the variance in scores of test anxiety ($\Delta r^2 = .39, \Delta F (1, 280) = 185.68, p < .001$). Effortful control explained 9% of the variance in scores of test anxiety ($\Delta r^2 = .09, \Delta F (1, 279) = 51.69, p < .001$). Academic self-concept explained 2% of the variance in participants' test anxiety scores ($\Delta r^2 = .02, \Delta F (1, 278) = 10.56, p = .001$). See Table 10 for results.

Table 10

*Hierarchical Regression Analysis**Intrapersonal variables on Test Anxiety; Examining Relative Strength of Each*

Predictor	B	SE B	β	Δr^2	t	p
Perceived threat of tests	.74	.08	.44	.39	8.86	.000
Effortful control	-.44	.08	-.26	.09	-5.38	.000
Academic self-concept	-.33	.10	-.18	.02	-3.25	.001

Note. $R^2 = .520$, ($F = 75.17$, $df = 4, 282$)

Research Question 2: How well do the contextual or environmental variables (Parental expectations and School climate) explain the variance in levels of self-reported test anxiety? Among these variables, what is the relative contribution of each in explaining the variance in test anxiety?

Hierarchical regression analysis was used to test whether the environmental factors significantly predicted students' levels of test anxiety. In order to control for gender, it was entered first as a predictor. Next, the variables of unrealistic parental expectations and school climate were entered simultaneously as predictors. The results of the regression indicated that the combination of the two predictors explained 7% of the variance ($R^2 = .07$, $F(3, 288) = 7.58$, $p < .01$). Unrealistic parental expectations significantly contributed to the model ($\beta = .18$, $p < .001$), but school climate did not ($\beta = -.11$, $p = .055$). See Table 11 for results.

Table 11

*Hierarchical Regression Analysis**Contextual Variables on Test Anxiety*

Predictor	B	SE B	β	t	p
Unrealistic parental expectations	.34	.12	.16	3.16	.002
School climate	-.12	.06	-.12	-1.93	.055

Note. $R^2 = .073$, ($F = 7.58$, $df = 3, 288$)

A second hierarchical regression analysis was then conducted, with unrealistic parental expectations entered first, to determine the relative contribution of each variable. The variables were entered in this order based on their respective proximity to the individual and on the strength of the correlations found in preliminary analyses in this study. These results indicated that unrealistic parental expectations explained 4% in the variance in scores of test anxiety ($\Delta r^2 = .04$, $\Delta F (1, 289) = 12.25$, $p = .001$). See Table 12 for results.

Table 12

*Hierarchical Regression Analysis**Contextual Variables on Test Anxiety; Examining relative strength of each*

Predictor	B	SE B	β	Δr^2	t	p
Unrealistic parental expectations	.34	.12	.16	.04	3.16	.002
School climate	-.12	.06	-.12	.01	-1.93	.055

Note. $R^2 = .073$, ($F = 7.58$, $df = 3, 288$)

Research Question 3: What is the combined role of the intrapersonal and contextual variables, with school climate as a moderator, in explaining a statistically significant proportion of variance in levels of test anxiety?

Hierarchical linear regression analysis was used to determine the combined role of the intrapersonal and contextual variables in explaining the variance in test anxiety. In addition, school climate was examined as a potential moderating variable of the relation between effortful control and test anxiety. First, all included variables were mean-centered to address potential issues of collinearity and to improve interpretation of resulting regression equations. As moderation tests for the interaction between predictors, a new variable was created in SPSS to represent the interaction between effortful control and school climate. This is achieved by essentially multiplying the values of the two variables. To control for gender, it was entered first as a predictor variable. Next, the variables of perceived threat of tests, unrealistic parental expectations, effortful control, academic self-concept, school climate, and the variable representing the interaction effect were entered simultaneously as predictors.

The results of the regression indicated that the combination of these predictors explained 53% of the variance ($R^2=.53$, $F(7, 271) = 43.96$, $p<.001$). In this model, perceived threat of tests ($\beta = -.44$, $p <.001$), effortful control ($\beta = -.27$, $p <.001$), and academic self-concept ($\beta = -.18$, $p <.001$) significantly contributed to the model. Unrealistic parental expectations ($\beta = .03$, $p = .469$), school climate ($\beta = .03$, $p = .527$), and the variable representing the interaction of effortful control and school climate ($\beta = -.02$, $p = .620$), did not significantly contribute to the model. According to these results, school climate does not moderate the relations between effortful control and test anxiety. See Table 13 for results.

Table 13

*Hierarchical Linear Regression Analysis**All Study Variables on Test Anxiety to Test for Moderation of School Climate*

Predictor	B	SE B	β	t	p
Perceived threat of tests	.75	.09	.44	8.81	.000
Unrealistic parental expectations	.07	.09	.03	.73	.469
Effortful control	-.45	.09	-.27	-5.15	.000
Academic self-concept	-.36	.11	-.18	-3.39	.001
School climate	.03	.04	.03	.63	.527
Interaction of School climate and Effortful control	-.02	.00	-.02	-.50	.620

Note. $R^2 = .520$, ($F = 43.96$, $df = 7, 271$)

A second hierarchical regression analysis was then conducted to determine the relative contribution of each variable. The predictor variables were entered in the following order: gender (as a control), perceived threat of tests, effortful control, unrealistic parental expectations, academic self-concept, school climate, and the interaction variable. The variables were entered in this order based on past research regarding the strength of these variables as predictors, on the strength of the correlations found in the preliminary analyses for this study, and on the beta weight values found in the first set of regression analyses. These results indicated that perceived threat of tests explained 39% of the variance in scores of test anxiety ($\Delta r^2 = .39$, $\Delta F(1, 276) = 187.21$, $p < .001$). Effortful control explained 9% of the variance in scores of test anxiety ($\Delta r^2 = .09$, $\Delta F(1, 274) = 51.76$, $p < .001$). Academic self-concept explained 2% of the variance in scores of test anxiety ($\Delta r^2 = .02$, $\Delta F(1, 273) = 11.27$, $p = .001$). See Table 14 for results.

Table 14

*Hierarchical Linear Regression Analysis**All Study Variables on Test Anxiety; Examining Relative Contribution of Each*

Predictor	B	SE B	β	Δr^2	t	p
Perceived threat of tests	.75	.09	.44	.40	8.81	.000
Effortful control	-.45	.09	-.27	.09	-5.15	.000
Unrealistic parental expectations	.07	.09	.03	.01	.73	.469
Academic self-concept	-.36	.11	-.18	.02	-3.39	.001
School climate	.03	.04	.03	.00	.63	.527
Interaction of School climate and Effortful control	-.02	.00	-.02	.00	-.50	.620

Note. $R^2 = .520$, ($F = 43.96$, $df = 7, 271$)

Post-hoc analyses

After examining the results of the analyses for research questions two and three, in which global school climate was not a significant predictor, it was hypothesized that the individual school climate factors should be examined. This was partially based on past research that examined school climate factors individually, and was supported by the fact that the subscales of school climate were not all highly intercorrelated. The highest correlation among the individual factors was .65 (Student input in decision making and Teacher support), and the remaining intercorrelations were .50 or less. The individual school climate scores were available in the current data, so post hoc analyses were

performed. Two post-hoc regression analyses were conducted to determine whether using individual factors instead of the school climate composite score would significantly predict test anxiety in the two models.

For the post-hoc regression analysis of research question two, gender was controlled for by entering it first as a predictor variable. Next, unrealistic parental expectations and the eight individual school climate factors (teacher support, negative peer interaction, positive peer interaction, disciplinary harshness, clarity and consistency of rules and expectations, instructional innovation and relevance, student commitment and achievement orientation, and student input in decision making) were entered simultaneously as predictors.

The results of the regression indicated that the combination of these predictors explained 12% of the variance ($R^2=.12$, $F(10, 281) = 3.83$, $p<.001$). In this model, unrealistic parental expectations ($\beta = .16$, $p = .009$) significantly contributed to the model. Of the variables representing the individual factors of school climate, only one was significant at the .05 level - disciplinary harshness ($\beta = .16$, $p = .015$). The remaining seven school climate factors were not found to significantly contribute to the model. The values for the non-significant individual school climate factors were as follows: Teacher support ($\beta = -.02$, $p = .819$), clarity and consistency of rules and expectations ($\beta = .11$, $p = .148$), student commitment and achievement orientation ($\beta = -.04$, $p = .562$), negative peer interaction ($\beta = .10$, $p = .120$), positive peer interaction ($\beta = -.06$, $p = .401$), instructional innovation and relevance ($\beta = -.12$, $p = .095$), and student input in decision making ($\beta = .06$, $p = .470$). See Table 15 for results.

Table 15

*Post-hoc Hierarchical Regression Analysis**Unrealistic parental expectations and Individual School Climate Factors on Test anxiety*

Predictor	B	SE B	β	t	p
Unrealistic parental expectations	.33	.12	.16	2.63	.009
Teacher support	-.09	.38	-.02	-.23	.819
Clarity and consistency of rules/expectations	.52	.36	.11	1.45	.148
Student commitment and achievement orientation	.21	.37	.04	.58	.562
Negative peer interactions	.51	.32	.10	1.56	.120
Positive peer interactions	-.29	.34	-.06	-.84	.401
Disciplinary harshness	.84	.34	.16	2.44	.015
Instructional innovation and relevance	-.80	.48	-.12	-1.67	.095
Student input in decision making	.25	.34	.06	.72	.470

Note. $R^2 = .120$, ($F = 3.83$, $df = 10, 281$)

For the post-hoc regression analysis of research question three, gender was controlled for by entering it first as a predictor variable. The remaining variables, including the individual school climate factors instead of the composite score, were then entered simultaneously as predictors. The variables entered simultaneously were: Perceived threat of tests, unrealistic parental expectations, effortful control, academic

self-concept, teacher support, negative peer interaction, positive peer interaction, disciplinary harshness, clarity and consistency of rules and expectations, instructional innovation and relevance, student commitment and achievement orientation, and student input in decision making.

The results of the regression indicated that the combination of these predictors explained 56% of the variance ($R^2=.56$, $F(13, 265) = 25.50$, $p < .001$). As was found previously, perceived threat of tests ($\beta = -.44$, $p < .001$), effortful control ($\beta = -.28$, $p < .001$), and academic self-concept ($\beta = -.16$, $p < .001$) significantly contributed to the model. Unrealistic parental expectations ($\beta = .02$, $p = .680$) did not significantly contribute to the model. Only one of the variables representing the individual factors of school climate – instructional innovation and relevance - was significant ($\beta = -.11$, $p = .038$). The values for the remaining individual school climate factors were as follows: Teacher support ($\beta = .11$, $p = .130$), clarity and consistency of rules and expectations ($\beta = .09$, $p = .085$), student commitment and achievement orientation ($\beta = -.00$, $p = .958$), negative peer interaction ($\beta = .06$, $p = .222$), positive peer interaction ($\beta = -.00$, $p = .955$), disciplinary harshness ($\beta = .09$, $p = .071$), and student input in decision making ($\beta = .03$, $p = .598$). See Table 16 for results.

Table 16

*Post-hoc Hierarchical Regression Analysis**All Study Variables, using Individual School Climate Factors, on Test anxiety*

Predictor	B	SE B	β	t	p
Perceived threat of tests	.75	.09	.44	8.81	.000
Unrealistic parental expectations	.04	.09	.02	.41	.680
Effortful control	-.47	.09	-.28	-5.39	.000
Academic self-concept	-.31	.11	-.16	-2.96	.003
Teacher support	.41	.27	.11	1.52	.130
Clarity and consistency of rules/expectations	.45	.26	.09	1.73	.085
Student commitment and achievement orientation	-.01	.27	-.00	-.05	.958
Negative peer interactions	.29	.24	.06	1.23	.222
Positive peer interactions	-.01	.25	-.00	-.06	.955
Disciplinary harshness	.45	.25	.09	1.82	.071
Instructional innovation and relevance	-.73	.35	-.11	-2.08	.038
Student input in decision making	.13	.25	.03	.53	.598

Note. $R^2 = .556$, ($F = 25.50$, $df = 13, 265$)

CHAPTER V

DISCUSSION

Because of the impact at both a school-wide and individual level, it is important to identify the variables that predict adolescent test anxiety. High levels of test anxiety result in lower levels of performance in almost all populations and across all academic domains (Hembree, 1988; McDonald, 2001). This is important to consider at a system or school wide level because of the increased use of school wide test results being used to make critical decisions regarding school policies, leadership, and funding. The practice of using test scores as a measure of accountability for schools has resulted in an increased awareness of, and interest in, raising test performance among all students. At the individual student level, the causes and correlates of test anxiety are important to consider because of the relation of test anxiety to negative outcomes, not only academically but socially and emotionally as well. Increased test anxiety has been linked to such factors as lowered global self-esteem, higher generalized anxiety, increased risk of dropout, and fewer positive peer relationships (Hembree, 1988; Lowe et al., 2008; Turner et al., 1993).

The purpose of this study was to examine the contributions of effortful control, academic performance, academic self-concept, parental expectations, perceived threat of tests, and school climate to adolescent test anxiety. Examining the intrapersonal factors as well as factors within both the school and home environments helps to better understand the complexity of the development of test anxiety. Included in this study were variables that represent both intraindividual factors (effortful control, academic self-concept, academic performance, and perceived threat of tests) and contextual factors (parental expectations and school climate). The study also examined whether the relation

between academic performance and test anxiety is mediated by academic self-concept. In addition, this study examined whether the factor of school climate served as a moderating variable between effortful control and test anxiety.

It was expected that the intrapersonal variables of effortful control, academic performance, academic self-concept, and perceived threat of tests would explain a statistically significant amount of variance in test anxiety, and that the relation between academic performance and test anxiety would be mediated by academic self-concept. It was expected that students low in effortful control, especially those with poor academic self-concept, and with a high level of perceived threat of tests would display the highest levels of test anxiety. It was also expected that the environmental variables of unrealistic parental expectations and school climate would explain a statistically significant amount of variance in test anxiety, with those students with unrealistic parental expectations and a more negative school climate expected to display the highest levels of test anxiety. Finally, it was expected that the combination of the intrapersonal and contextual variables would explain a statistically significant proportion of variance in test anxiety, and that school climate would serve as a moderator of the relation between effortful control and test anxiety.

In general, the results of this study were mixed. Only some of the hypotheses were supported. The intrapersonal factors did predict test anxiety as hypothesized. The contextual factors, however, did not predict test anxiety as strongly as was expected, and the hypothesized moderating role of school climate on the relation between effortful control and test anxiety was unsupported. This study examined test anxiety using variables from within both the school and home environments to better understand how

these variables interact to predict levels of test anxiety. To follow is a discussion of the analysis of each research question.

Preliminary analyses revealed a small but significant difference in mean scores of test anxiety by gender, so gender was controlled for in subsequent analyses. In past research, gender differences have been found in measures of test anxiety (Cassady & Johnson, 2002; Eum & Rice, 2011; Lapointe, Legault, & Batiste, 2005; McDonald, 2001). Hembree's meta-analysis (1988) found that these differences did not translate into meaningful differences in performance. Other research has attributed gender differences in self-reported test anxiety to the fact that females are more likely than males to report any type of internalizing symptoms (McDonald, 2001; Turner et al., 1993). In the preliminary analyses, ANOVA was used to determine that significant differences in test anxiety existed by gender. However, in the mediation, regression, and moderated regression analyses, gender was not found to be a significant predictor of test anxiety in this sample.

Research Question 1: How well do the individual intrapersonal variables (Effortful control, Academic performance, Academic self-concept, and Perceived threat of tests) explain the variance in levels of self-reported test anxiety, after controlling for the hypothesized mediation effect of academic self-concept on GPA? Among these variables, what is the relative contribution of each in explaining the variance in test anxiety?

The first research question explored the intrapersonal variables that predict test anxiety. The first hypothesis was that the relation between academic performance (as measured by GPA) and test anxiety is mediated by academic self-concept. This hypothesis was tested using a mediation procedure and was found to be statistically

significant. Academic self-concept was shown to fully mediate the relation between academic performance and test anxiety, meaning that it is academic self-concept that explains the relation between academic performance (GPA) and test anxiety. This finding is consistent with the existing research on academic self-concept and grade point average. Academic performance (typically measured by grade point average) is the strongest predictor of academic self-concept. Academic self-concept is critically related to school performance for many reasons. It influences the types of academic situations a student chooses, how much a student is willing to challenge him/herself, and the level of persistence a student exhibits toward academic activities (Fraser, 1984; Fraser & Rentoul, 1982; Lowe & Reynolds, 2004). Students' test performance is closely tied to academic self-concept, as tests provide the most frequent opportunities for self-evaluation and comparison with peers. Low academic self-concept leads to the anticipation of negative outcomes (Putwain et al., 2010). This results in the student perceiving the test situation as threatening, which puts him/her at higher risk for test anxiety. The results of the current study indicate that the direct relation between grade point average and test anxiety is no longer significant when controlling for academic self-concept.

The second hypothesis was that the intrapersonal variables of effortful control, academic performance, academic self-concept, and perceived threat of tests would significantly explain the variance in test anxiety. This hypothesis was tested using hierarchical regression analysis, controlling for gender, and was found to be statistically significant. The combination of the intrapersonal variables was found to account for 52% of the variance in test anxiety. Each of the variables - effortful control, perceived threat of tests, and academic self-concept - significantly contributed to the model, and the effect

size of the overall model was large based on recent guidelines for social science research (Ferguson, 2009). This is consistent with existing research on the predictor variables. Effortful control may be related to test anxiety through the ability to manage interfering negative thoughts during the test situation. Students with low levels of effortful control have difficulty redirecting self-focused attention (e.g., from physiological sensations back to the task at hand), and are more likely to over-attend to threatening and irrelevant stimuli (Moriya & Tanno, 2007). Effortful control is linked to the control of thoughts and emotions and to the ability to choose among competing responses (Lerner & Castellino, 2002; Posner & Rothbart, 1998). The development of effortful control also serves as a protective factor for temperament traits that may otherwise be detrimental in the educational setting, such as high levels of temperamental fearfulness or frustration. Perceived threat of tests was also predictive of test anxiety, which is consistent with existing research. Students with a high perceived threat of tests view evaluative situations as stressful events that have the potential to cause the student harm in some way (e.g., impact on grades, self-esteem, and disappointment to teachers or parents). Students who feel highly threatened by evaluation or tests often worry about the consequences of failing, such as grade retention or summer school (Triplett & Barksdale, 2005). Students who perceive tests as threatening have more feelings of helplessness and more avoidant behavior during test preparation. Finally, the predictive value of academic self-concept in test anxiety found in this study has also been supported in past research. Strong academic self-concept has been shown to have a negative relation with anxiety in general, and with performance anxiety specifically (Fite et al., 1992; Putwain, 2009).

The third hypothesis for the first research question related to the direction of the associations between the predictor variables and test anxiety. It was hypothesized that students who were low in effortful control, with poor academic self-concept and a high level of perceived threat of tests would display the highest level of test anxiety. This hypothesis was also supported, and all relations were found to be in the expected direction. Inverse associations were found between effortful control and test anxiety, as well as academic self-concept and test anxiety. Low levels of effortful control predicted higher levels of test anxiety, and low levels of academic self-concept also predicted higher levels of test anxiety. The relation between perceived threat of tests and test anxiety was positive, indicating that higher level of perceived threat predicted higher levels of test anxiety.

Overall, the hypotheses for question one were supported. Academic self-concept was found to fully mediate the relation between academic performance and test anxiety. The intrapersonal variables of effortful control, academic self-concept, and perceived threat of tests explained a significant proportion of the variance in test anxiety. Finally, the direction of the relations between the predictor variables and test anxiety were found to be in the expected direction. Future studies may want to retest the study variables in order to confirm the findings. Future studies may also wish to examine whether perceived threat of tests mediates the role of academic self-concept in predicting test anxiety. In addition, future studies may want to examine samples with more diverse racial and socioeconomic backgrounds.

Research Question 2: How well do the contextual or environmental variables (parental expectations and school climate) explain the variance in levels of self-reported test anxiety? Among these variables, what is the relative contribution of each in explaining the variance in test anxiety?

The second research question explored the contextual or environmental variables that predict test anxiety. The first hypothesis was that the contextual variables of unrealistic parental expectations and school climate would significantly explain the variance in test anxiety. This hypothesis was tested using hierarchical regression analysis, controlling for gender, and was partially supported. The combination of the contextual variables was found to account for 7% of the variance in test anxiety. The variable of unrealistic parental expectations contributed significantly to the model; however, the effect size was small. School climate did not significantly contribute to the model. The small but significant contribution of unrealistic parental expectations to test anxiety is supported by past research. Early research on test anxiety suggested that test-anxious reactions developed from negative experiences with evaluative situations in the home, starting from a very young age (Sarason et al., 1960). More recent research suggests that when parents' expectations are unrealistically high, it fosters maladaptive perfectionism and performance anxiety in their children (Ablard & Parker, 1997; Lapointe et al., 2005).

School climate, on the other hand, did not significantly predict test anxiety in this sample. Although past research exploring the relation between these two variables is limited, it has shown that aspects of school climate account for a significant proportion of between-schools variance on reading and math performance, grade point average,

academic self-efficacy, and academic aspirations (Brand et al., 2003; Fraser & O'Brien, 1985; Tanzer, 1990). School climate has also been linked to students' goal orientation, with students in positive school climates more likely to adopt mastery or learning goals, which in turn is related to lower levels of anxiety in evaluative situations (Hardré et al., 2007). School climate has also been linked to engagement in learning and in motivation (Putnam & Stifter, 2008; Tanzer, 1990). Additionally, school climate has been found to be related to general anxiety as well as test anxiety, and to depression and alienation (Marsh et al., 2008; Tanzer, 1990). Certain specific aspects of school climate (i.e., teacher support, student input in decision making, and competitiveness) have been found to be directly related to test anxiety (Birenbaum, 2007; Lapointe et al., 2005; Preckel et al., 2008).

There are several reasons why school climate may not have been shown to be a significant predictor of test anxiety in this study. One of these may have been problems inherent with studying school climate among young adolescents who have essentially six different classroom environments throughout the day. The principal investigator was asked multiple times by different student participants how to answer the questions from the school climate measure when they could endorse certain items for some classes or teachers, but not for others. It appeared based on the questions asked of the principal investigator that the student participants struggled with responding to the items on a school-wide level when their assessment of the climate differed from class to class. After the main analyses were conducted, it was determined that another limitation was that the measure of school climate used in the analysis was too broad, and that perhaps only certain specific aspects of school climate, such as teacher support or competitiveness, can

significantly predict test anxiety. However, post-hoc analyses revealed that none of the individual school climate factors could consistently predict test anxiety across multiple models.

The second hypothesis for the second research question related to the direction of the relations between the predictor variables and test anxiety. It was hypothesized that students with unrealistic parental expectations who perceived a more negative school climate would display the highest level of test anxiety. This hypothesis was also partially supported, in that the significant relation between unrealistic parental expectations and test anxiety was in the expected direction. Higher levels of unrealistic parental expectations predicted higher levels of test anxiety, although the strength of the association was small.

Overall, the hypotheses for research question two were partially supported. Level of unrealistic parental expectations predicted levels of test anxiety, and in the hypothesized direction. School climate, however, did not significantly predict test anxiety in this sample, even when examined using the individual school climate factors rather than an overall score. Future research in this area may wish to utilize a sample of older adolescents who maybe better able to conceptualize and report on climate at a school-wide level, even with discrepancies between individual classrooms and teachers.

Research Question 3: What is the combined role of the intrapersonal and contextual variables, with school climate as a moderator, in explaining a statistically significant proportion of variance in levels of test anxiety?

The third research question explored the degree to which the combination of all of the study variables predicted test anxiety, as well as the moderating role of school climate

on effortful control. The first hypothesis for research question three was that the combination of both the intrapersonal and contextual variables would explain a statistically significant proportion of the variance in test anxiety. This hypothesis was partially supported. The combination of the intrapersonal and contextual variables accounted for 53% of the variance in test anxiety. In this model, perceived threat of tests, effortful control, and academic self-concept were significant predictors of level of test anxiety. However, unlike in the analysis run for research question number two, unrealistic parental expectations did not contribute significantly when all of the predictor variables were included in the model. As was the case in the previous analysis, school climate did not predict test anxiety. Post-hoc analysis using individual school climate factors instead of a composite school climate score to predict test anxiety was also not significant.

The second hypothesis for research question three was that school climate would moderate the relation between effortful control and test anxiety, meaning that students with low effortful control in a positive school climate would show lower levels of test anxiety than students with low effortful control in a negative school climate. This hypothesis was also not supported. The interaction of effortful control and school climate did not predict levels of test anxiety based on the analyses performed for this study. Past research has examined school climate as a moderator of other relations. School climate has been shown to moderate the negative effect of children's disruptive behavior on academic achievement (Posner & Rothbart, 1998). School climate has also been shown to moderate the relation between effortful control with conduct problems and depression (Cohen et al., 2008; Loukas & Robinson, 2004). As was explained above,

some possible reasons for the lack of support for this proposed relation may be related to the age and understanding of the sample population, as well as methodological weaknesses in the measurement and analysis of school climate as a construct. It is also possible that there truly is no effect, and a rethinking of how these variables may be associated with each other is warranted for future research.

Overall, the hypotheses for research question three were unsupported. While the proposed combination of variables did predict test anxiety as an overall model, only three of the five significantly contributed to the model. In addition, the hypothesized moderating role of school climate was unsupported. Future research in this area may wish to utilize an older population of adolescents who may be better able to respond to questions about school-wide climate.

Limitations of the study and directions for future research

Several methodological limitations exist for this study. First, all of the data collected was dependent on self-report, and measures from multiple perspectives are important to collect. Also, many of the student participants reported having a difficult time with the measure of school climate, and many reported to the principal investigator or assistants that they were unsure of their grade point averages. These problems were not detected in the pilot study. Future research in this area could utilize parent or teacher completed measures of the intrapersonal constructs as well, and variables such as academic performance could be obtained through school records.

Related to this, there were limitations with the actual measurement of the constructs. Students reported to the principal investigator and assistants that they struggled to answer questions about school-wide climate when they move between

teachers throughout the day, recognizing that the dynamics differ by each class. They appeared to have a hard time being able to think more broadly about climate, and to be able to generalize to a school level rather than classroom level. This problem was not expected and was not detected in the pilot study. An improvement for future studies would be to include more direction or guidance to participants in how to think about their responses to the questions.

One of the school climate factors linked to test anxiety in past research is teacher support, and one student participant asked how he could answer questions related to teacher support when he felt very strongly agreeable to the question when considering one teacher, but not another. Another student asked a similar question about a school climate item that was related to competitiveness among peers, a factor also linked to test anxiety in past research. She explained that some of her classes were highly competitive, while others were not. There is considerable need for further research on measures of school climate at the secondary level. While the instrument used in this study has strong psychometric properties, existing measures of school climate represent a wide range of factors of school climate, which makes past research on overall school climate difficult to generalize to studies using different measures.

Another limitation of the current study is that of the conceptualization of test anxiety as a construct, and of its measurement with this sample. It can be debated from past research whether test anxiety should be measured as a state or trait. In early foundational test anxiety research, it was suggested that the relation between trait anxiety and decreases in performance was partially mediated by state anxiety (King, Heinrich, Stephenson, & Spielberger, 1976). Recent research recognizes test anxiety as a state,

predictive of decreased performance in its own right, but highly correlated with trait anxiety. For the purposes of this study, test anxiety was conceptualized and measured as a student's cognitive reactions to academic performance situations, before, during, and after these tasks (Cassady & Johnson, 2002). This state is aroused and maintained by factors that influence one's cognitive evaluation of the situation during all phases of the learning-testing cycle (Cassady & Johnson, 2002; Morris et al., 1981, Naveh-Benjamin, 1991). Some of the thoughts students high in test anxiety report include: comparing self to classmates, consequences of failure, lack of confidence in performance, excessive worry, disappointing parents or teachers, and feeling unprepared (Cassady & Johnson, 2002).

However, even students highly prone to experiencing test anxiety do not experience it in every evaluative situation. A student with trait anxiety and a proneness to test anxiety specifically will not be as likely to experience symptoms of test anxiety and its corresponding impact on performance if given an evaluative task which is easy for him/her, which he/she feels well prepared for, or which he/she feels is of little or no consequence. For example, a student may experience test anxiety in Geometry with almost every test and quiz, but be able to take an exam in English Language Arts with no symptoms if he/she feels confident about his/her ability in that subject. With this study, students were asked general questions about taking tests. It may be that students of this age struggle to think globally about their levels of test anxiety in general. If a student was thinking of a test he/she took that day on a subject in which he/she has confidence, his/her overall level of test anxiety may have been underrepresented, and vice versa. As was the case with the measure of school climate, several students asked questions of the

researcher and assistants about how to answer the test anxiety questions; such as “which class are you asking about?” One student reported “I always feel this way about math, but not in my other classes.” Future research in this area would benefit from using measures that examine test anxiety more specifically, such as in the specific contexts of math, science, or the English Language Arts area. It may be that test anxiety is not stable enough a trait to measure on such a global level, and that the state of test anxiety is dependent on too many other factors to be measured as such, at least with a young adolescent population.

Finally, there is limitation in using a cross sectional design and in the sample itself. Methodology in future studies of test anxiety could focus not only on establishing causal relations via longitudinal studies, but also with a broader demographic range. The population of the current study was primarily Caucasian (70.4%) and lower middle class (based on free/reduced lunch statistics of the school). All of the students were in seventh or eighth grade. Future studies should be conducted with a more heterogeneous racial and socioeconomic group, spanning a broader age range, and with sensitivity to including as many students as possible who may not want to participate because of anxiety.

Summary

In spite of the limitations of this study, several of the findings make it a significant contribution to the existing literature on test anxiety. First, the current study found that academic self-concept fully mediates the relation between academic performance (grade point average) and test anxiety. Extensive research exists on the relation between grade point average and test anxiety, and much of it concludes that the association is bidirectional. In many of these studies, however, the role of academic self-

concept in that association was not addressed. This is important to consider when designing and evaluating interventions for test anxiety, as it appears that academic self-concept that is actually the predictor, not simply grade point average.

Additionally, the current study found several factors that were consistently significant predictors of test anxiety across different regression models: perceived threat of tests, effortful control, and academic self-concept. Specifically, high levels of perceived threat, low levels of effortful control, and low academic self-concept predicted increases in self-reported level of test anxiety. It is also important to recognize the factors that did not significantly predict test anxiety when all variables were considered, which were parental expectations and school climate, and that school climate did not moderate the relation between effortful control and test anxiety. This is important because it demonstrates that interventions for test anxiety, at least based on the results from this study, will be most effective if targeted at the intrapersonal level of individual students. These results suggest that interventions for test anxiety that are focused on parent factors or school-wide factors may be less effective. In general, while it is always important to consider factors across all ecological levels, the current study reveals the importance of intrapersonal variables in predicting test anxiety.

Implications for practitioners and educators

It is important to understand the causes, correlates, and outcomes of test anxiety, especially during an era of education policy when decisions are often based upon students' performance on standardized tests. Students whose performance is decreased because of test anxiety may not be properly identified in the school setting. Test anxiety is easily overlooked by teachers and parents, especially in comparison to aggressive or

disruptive behaviors in the classroom. This makes screening for test anxiety even more important in order to identify and intervene with students who are underperforming because of anxiety. Additionally, test anxious students are highly likely to be experiencing other more generalized symptoms of anxiety and depression, and screening for test anxiety initially may also help to identify students in need of further intervention for internalizing disorders (Hembree, 1988; Turner et al., 1993; Weems et al., 2010). Weems and colleagues (2010), in recent research on test anxiety interventions, have found that children in general are valid reporters of internalizing symptoms such as anxiety, that there are no lasting harmful effects of asking about their anxiety, and that there is extremely low probability of negative effects of school-based cognitive and behavioral therapy anxiety reduction strategies. Weems and colleagues (2010) recently developed an empirically supported test anxiety intervention program that includes components of relaxation training, gradual exposure to anxiety-provoking test-related stimuli, and positive reinforcement for progress.

School psychologists, in particular, are knowledgeable about screening and implementation of intervention, and this knowledge could be used to reduce test anxiety in schools. They can provide expertise in regards to research, program implementation, data collection, and program evaluation of interventions for test anxiety. They can also advocate for support from administrators, school boards, and funding sources for implementation of data driven intervention programs that show positive results in decreasing test anxiety. Research on the predictors and outcomes of test anxiety is critical for educators, policy makers and school officials to understand in order to

implement and sustain screening and intervention programs that will improve performance for all students.

APPENDIX A

1. What grade are you in?

- Sixth (6th)

 Seventh (7th)

 Eighth (8th)

2. What is your gender?

- Female
 Male

3. With which ethnic/racial category do you most identify? (check all that apply)

- | | |
|---|---|
| <input type="checkbox"/> African American/Black | <input type="checkbox"/> Hispanic |
| <input type="checkbox"/> Asian/Pacific Islander | <input type="checkbox"/> Middle Eastern |
| <input type="checkbox"/> Caucasian | <input type="checkbox"/> Other _____ |

4. What is your cumulative GPA? What are your average grades? (Please mark only one answer)

- | | |
|---|--|
| <input type="checkbox"/> 4.0 or higher (All A's) | <input type="checkbox"/> 2.5 to 2.99 (More B's than C's) |
| <input type="checkbox"/> 3.75 to 3.99 (Mostly A's) | <input type="checkbox"/> 2.0 to 2.49 (More C's than B's) |
| <input type="checkbox"/> 3.5 to 3.74 (More A's than B's) | <input type="checkbox"/> 1.5 to 1.99 (More C's than D's) |
| <input type="checkbox"/> 3.25 to 3.49 (More B's than A's) | <input type="checkbox"/> 1.0 to 1.49 (More D's than C's) |
| <input type="checkbox"/> 3.0 to 3.24 (Mostly B's, some A's and C's) | <input type="checkbox"/> Less than 1.0 |
| <input type="checkbox"/> (Mostly D's and F's) | |

CTA

These are questions about thoughts people sometimes have when taking tests. Please answer the questions using the following scoring rubric and circle only one number for each item.

The statement is:

1 = Not at all typical of me
typical of me

2 = Somewhat typical of me
of me

3 = Quite

4 = Very typical

		Not at all typical	Some what typical	Quite typical	Very typical
1.	I lose sleep over worrying about tests.	1	2	3	4
2.	I worry more about doing well on tests than I should.	1	2	3	4
3.	I get distracted from studying for tests by thoughts of failing.	1	2	3	4
4.	I have difficulty remembering what I studied for tests.	1	2	3	4
5.	While preparing for a test, I often think that I am likely to fail.	1	2	3	4
6.	I am not good at taking tests.	1	2	3	4
7.	When I first get my copy of a test, it takes me awhile to calm down to the point where I can begin to think straight.	1	2	3	4
8.	At the beginning of a test, I am so nervous that I often can't think straight.	1	2	3	4
9.	When I take a test that is difficult, I feel defeated before I even start.	1	2	3	4
10	When taking an important test, I find myself wondering whether the other students are doing better than I am.	1	2	3	4

11	I tend to freeze up on things like intelligence tests and final exams.	1	2	3	4
12	During tests, I find myself thinking of the consequences of failing.	1	2	3	4
13	When I take a test, my nervousness causes me to make careless errors.	1	2	3	4
14	My mind goes blank when I am pressured for an answer on a test.	1	2	3	4
(CTA cont.)					
15	During tests, the thought frequently occurs to me that I may not be too bright.	1	2	3	4
16	During a course examination, I get so nervous that I forget facts I really know.	1	2	3	4
17	I do not perform well on tests.	1	2	3	4
18	During tests, I have the feeling that I am not doing well.	1	2	3	4
19	I am a poor test taker in the sense that my performance on a test does not show how much I really know about a topic.	1	2	3	4
20	After taking a test, I feel I should have done better than I actually did.	1	2	3	4
21	My test performances make me believe that I am not a good student.	1	2	3	4
22	I often realize mistakes I made right after turning in a test.	1	2	3	4
23	When I finish a hard test, I am afraid to see the score.	1	2	3	4
24	When I get a good grade on a test, it is usually because I got lucky.	1	2	3	4

25 I don't seem to have much control over my test scores. 1 2 3 4

EATQ-R

For each of the following statements, please circle the answer that best describes how true each statement is for you. Please circle the first answer that comes to you. The statement is:

1 = Almost always untrue 2 = Usually untrue 3 = Sometimes true/untrue
4 = Usually true 5 = Almost always true

	Almost always <u>UN</u> true	Usually <u>UN</u> true	Neutral	Usually true	Almost always true
1. I have a hard time finishing things on time.	1	2	3	4	5
2. It's hard for me not to open presents before I'm supposed to.	1	2	3	4	5
3. When someone tells me to stop doing something, it is easy for me to stop.	1	2	3	4	5
4. I do something fun for awhile before starting my homework, even when I'm not supposed to.	1	2	3	4	5
5. The more I try to stop myself from doing something I shouldn't, the more likely I am to do it.	1	2	3	4	5
6. If I have a hard assignment to do, I get started right away.	1	2	3	4	5
7. I find it hard to shift gears when I go from one class to another at school.	1	2	3	4	5
8. When trying to study, I have difficulty tuning out background noise and concentrating.	1	2	3	4	5
9. I finish my homework before the due date.	1	2	3	4	5
10. I am good at keeping track of several different things that are happening around me.	1	2	3	4	5
11. It's easy for me to keep a secret.	1	2	3	4	5

- | | | | | | |
|--|---|---|---|---|---|
| 12. I put off working on projects until right before they are due. | 1 | 2 | 3 | 4 | 5 |
| 13. I pay close attention when someone tells me how to do something. | 1 | 2 | 3 | 4 | 5 |
| 14. I tend to get in the middle of one thing, then go off and do something else. | 1 | 2 | 3 | 4 | 5 |
| 15. I can stick with my plans and goals. | 1 | 2 | 3 | 4 | 5 |
| 16. It is easy for me to really concentrate on homework problems. | 1 | 2 | 3 | 4 | 5 |

ISC-S

For each of the following statements, please circle the answer that best describes how true you feel each statement is about your school. Please mark only one best answer. The statement is true about my school:

	Never	Hardly ever	Some times	Most of the time	Always
1. Students put a lot of energy into what they do here.	1	2	3	4	5
2. Students in this school get to know each other really well.	1	2	3	4	5
3. New ideas are tried out here.	1	2	3	4	5
4. Teachers make a point of sticking to rules in classes.	1	2	3	4	5
5. Students work hard to complete their assignments.	1	2	3	4	5
6. Students in this school are mean to each other.	1	2	3	4	5
7. Teachers take a personal interest in students.	1	2	3	4	5
8. Students in this school are very interested in getting to know other students.	1	2	3	4	5
9. Teachers are very strict here.	1	2	3	4	5
10. In our school, students are given the chance to help make decisions.	1	2	3	4	5
11. Students try to get the best grades that they can.	1	2	3	4	5
12. There are students in this school who pick on other students.	1	2	3	4	5

13.	Teachers go out of their way to help students.	1	2	3	4	5
14.	Students enjoy working together on projects in classes.	1	2	3	4	5
15.	New and different ways of teaching are tried in classes.	1	2	3	4	5
16.	Students get in trouble for talking.	1	2	3	4	5
17.	Grades are very important to students.	1	2	3	4	5
18.	Students in this school have trouble getting along with each other.	1	2	3	4	5
19.	Teachers like students to try unusual projects.	1	2	3	4	5
20.	Students in this school have a say in how things work.	1	2	3	4	5
21.	When teachers make a rule, they mean it.	1	2	3	4	5
22.	Students work hard for good grades in classes.	1	2	3	4	5
23.	In classes, students find it hard to get along with each other.	1	2	3	4	5
24.	In classes, we are given assignments that help us to find out about things outside of school.	1	2	3	4	5
25.	Students are given clear instructions about how to do their work in classes.	1	2	3	4	5
26.	Students get to know each other well in classes.	1	2	3	4	5
27.	Students get to help decide some of the rules in this school.	1	2	3	4	5

- | | | | | | | |
|-----|---|---|---|---|---|---|
| 28. | If students want to talk about something, teachers will find time to do it. | 1 | 2 | 3 | 4 | 5 |
| 29. | Students understand what will happen to them if they break a rule. | 1 | 2 | 3 | 4 | 5 |
| 30. | If some students are acting up in class, the teachers will do something about it. | 1 | 2 | 3 | 4 | 5 |
| 31. | Students get in trouble for breaking small rules. | 1 | 2 | 3 | 4 | 5 |
| 32. | Students really enjoy their classes. | 1 | 2 | 3 | 4 | 5 |
| 33. | Teachers ask students what they want to learn about. | 1 | 2 | 3 | 4 | 5 |
| 34. | Students enjoy doing things with each other in school activities. | 1 | 2 | 3 | 4 | 5 |
| 35. | It is easy for a student to get kicked out of class in this school. | 1 | 2 | 3 | 4 | 5 |
| 36. | Teachers help students to organize their work. | 1 | 2 | 3 | 4 | 5 |
| 37. | Students in this school feel students are too mean to them. | 1 | 2 | 3 | 4 | 5 |
| 38. | Students help decide how class time is spent. | 1 | 2 | 3 | 4 | 5 |
| 39. | Teachers help students catch up when they return from an absence. | 1 | 2 | 3 | 4 | 5 |
| 40. | The rules in this school are too strict. | 1 | 2 | 3 | 4 | 5 |

MPS-PE

These are questions about how you view your parents' expectations for you. Please answer the questions using the following scoring rubric and circle only one number for each item. The statement is:

1 = Not at all true for me
2 = Somewhat true of me

3 = Pretty true for me
4 = Very true for me

	Not at all true	Somewh at true	Pretty true	Very True
1. My parents set very high standards for me.	1	2	3	4
2. My parents want me to be the best at everything.	1	2	3	4
3. Only outstanding performance is good enough in my family.	1	2	3	4
4. My parents have expected excellence from me.	1	2	3	4
5. My parents have always had higher expectations for my future than I have.	1	2	3	4
6. My parents expect me to never make mistakes in school.	1	2	3	4
7. My parents think the most important thing is for me to show others how good I am in school.	1	2	3	4
8. Even when I try my hardest, my parents still think I could have done better.	1	2	3	4
9. My parents are disappointed in me if my performance in school is not perfect.	1	2	3	4
10. My parents expect me to get better grades than I am capable of.	1	2	3	4
11. My parents want me to get perfect scores on tests, even if I don't understand the material.	1	2	3	4
12. It's very important to my parents that others think I'm smart.	1	2	3	4

- | | | | | |
|--|---|---|---|---|
| 13. My parents would like me to do challenging school work, even if I make mistakes. | 1 | 2 | 3 | 4 |
| 14. My parents want me to understand my school work, not just memorize how to do it. | 1 | 2 | 3 | 4 |
| 15. My parents want me to see how my class work relates to things outside of school. | 1 | 2 | 3 | 4 |

SAAS-R

Please rate how strongly you agree or disagree with the following statements. In answering each question, use a range from (1) to (7), where (1) stands for "Strongly disagree," and (7) stands for "Strongly agree." Please circle only one number for each question.

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly Agree
1. I am intelligent.	1	2	3	4	5	6	7
2. I can learn new ideas quickly in school.	1	2	3	4	5	6	7
3. I am smart in school.	1	2	3	4	5	6	7
4. I am good at learning new things in school.	1	2	3	4	5	6	7
5. School is easy for me.	1	2	3	4	5	6	7
6. I can grasp complex concepts in school.	1	2	3	4	5	6	7
7. I am capable of getting straight A's.	1	2	3	4	5	6	7

PTT

When answering the following questions, please think of the *next test you will be taking* in school. For each of the following statements, please circle the answer that best describes how much you agree or disagree. Please circle only one number for each question.

1 = Strongly Disagree 2=Disagree 3= Neutral
4 = Agree 5 = Strongly Agree

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Tests in my classes are easy.	1	2	3	4	5
2. My performance on my next test will not affect my grade.	1	2	3	4	5
3. My next test is likely to have a bad effect on my grade.	1	2	3	4	5
4. If I do poorly on my next test, I will not get the grade I want in the class.	1	2	3	4	5
5. This will be a very important test to my GPA.	1	2	3	4	5
6. I have worried a lot about my next test.	1	2	3	4	5
7. I am well prepared for my next test.	1	2	3	4	5
8. I have not had time to fully prepare for my next test.	1	2	3	4	5
9. I think I will do poorly on my next test.	1	2	3	4	5
10. I think I will do better than most other students on my next test.	1	2	3	4	5
11. I am confident that I will get a good grade.	1	2	3	4	5
12. I believe I can answer most of the questions on my next test correctly.	1	2	3	4	5
13. I have not thought much about my next test.	1	2	3	4	5

- | | | | | | |
|---|---|---|---|---|---|
| 14. My next test is nothing to get too concerned about. | 1 | 2 | 3 | 4 | 5 |
| 15. I don't need to worry about my next test as much as other people in my class. | 1 | 2 | 3 | 4 | 5 |
| 16. I don't know how to prepare for my next test. | 1 | 2 | 3 | 4 | 5 |
| 17. I regret not studying for my next test earlier. | 1 | 2 | 3 | 4 | 5 |
| 18. My next test is going to be hard. | 1 | 2 | 3 | 4 | 5 |

APPENDIX B**Recruitment Script**

(Ages 11-14)

Title: The Moderating Role of School Climate in Adolescent Test Anxiety**Study Investigator: Lea Ann Imasa****Procedures for PI and RAs:**

“Hello, my name is _____. We are doing a research study today in your school. This study is being done to find out which things may cause students to feel anxiety when taking tests.

Your parents have been contacted and informed about the study. They had the option to refuse your participation in this study. Even if your parents gave permission, you do not have to participate if you do not want to, and you may stop at any time with no consequences. If you do not want to participate in the study, you may go to (the alternate room’s location, e.g., the gym, library) to work on an activity of your choice, such as homework, or read a book. There will also be crossword and Sudoku puzzles available for you if you choose.

If you would like to participate in the study, you will be asked to listen carefully while I read something called an Adolescent Assent Form, which you will then sign. Then you will complete a packet of questionnaires. This should take you about 20-25 minutes. All of your answers will be kept private and will not be shared with your parents or teachers. When you are done, you will get to choose a candy bar and will also be entered into a raffle to win a \$25 gift card to Best Buy or iTunes.

Are there any questions?”

APPENDIX C

Parental Research Information Sheet

Title of Study: The Moderating Role of School Climate in Adolescent Test Anxiety

Study Purpose:

Your child is being asked to be in a research study at Algonquin Middle School to see how differences in academic self-concept, parental expectations, perceived threat of tests, academic performance, school climate, and certain temperament traits may influence the level of test anxiety that adolescents experience. The study is being conducted at Algonquin Middle School. The estimated number of study participants to be enrolled is 300 students in grades six through eight. The knowledge gained by this study will improve our understanding of intra-individual and contextual factors that may lead to reductions in the prevalence of test anxiety. The results will be used as part of a doctoral dissertation at Wayne State University, College of Education, Department of Educational Psychology. Please read this form and ask any questions you may have before agreeing to allow your child to be in the study.

The study is being conducted by Lea Ann Imasa, MA, Doctoral Candidate at Wayne State University.

Study Procedures:

If your child takes part in the study, he/she will be asked to complete a packet of questionnaires:

1. A short demographic questionnaire, including questions about the grades he/she typically receives in school.
(For example: age, gender, grade in school).
2. A questionnaire about behaviors related to test anxiety
(e.g., "Thoughts of doing poorly interfere with my concentration on tests").
3. A questionnaire about certain temperament traits referred to as Effortful Control
(e.g., "I am good at keeping track of several different things that are happening around me).
4. A questionnaire about the emotional climate of the school
(e.g., "In our school, students are given the change to help make decisions").
5. A questionnaire about his/her parents expectations for achievement
(e.g., "My parents have expected excellence from me").
6. A questionnaire about academic self-concept
(e.g., "I can learn new ideas quickly in school").
7. A questionnaire about his/her perceived threat of the testing situation
(e.g., "The tests in my class are nothing to get too concerned about")

Copies of the Demographic Questionnaire, the Cognitive Test Anxiety scale, the Early Adolescent Temperament Questionnaire-Revised, School Attitude Assessment Survey-Revised, Inventory of School Climate-Student, Multidimensional Perfectionism Scale, and Perceived Threat of Tests Questionnaire will be available in the school office for your review.

Your child's participation in this study will take approximately one class period (50-55 minutes) and will be conducted during the school day. The researcher or her assistants will enter all

classrooms selected to participate and the participants will complete the packet of surveys. Teachers from selected classrooms will be made aware of the purpose of the study. All responses on the surveys will be presented in summarized form, with no child identified in the findings. Although teachers will be aware of your child's participation in the study, individual survey responses will not be available to them.

Benefits:

There may be no direct benefits for you; however, information from this study may benefit other people now or in the future.

Risks:

By taking part in this study, your child may experience the following risks:

1. Some students may perceive a loss of confidentiality due to their participation with other students in their classes. This situation can be controlled by cautioning the students not to discuss their survey responses among other participating students or with students who did not participate in the study.
2. In the unlikely event that some students experience negative reactions or feelings from their participation in the study, those students will be seen by the school counselor. If the problem cannot be handled on the school level, parents will be contacted. A list of counseling services external to the school will be provided if necessary.

There may also be risks involved in taking part in this study that are not known to researchers at this time.

Costs:

There will be no costs to you or your child for participation in this research study.

Compensation:

Your child will not be paid for taking part in this study. However, for taking part in this research study, your child will be given a raffle ticket after returning the completed study questionnaires. After the study is over, several raffle tickets will be chosen at random, and those students will receive a \$25 gift certificate to Best Buy or iTunes.

Confidentiality:

All information collected about your child during the course of this study will be kept confidential and anonymous. Your child may be identified in the research records by a code name or number. There will be no list that links your child's identity with this code. Information that identifies your child personally will not be released without your written permission. However, the Human Investigation Committee (HIC) at Wayne State University or federal agencies with appropriate regulatory oversight (e.g. Office for Human Research Protections [OHRP], Office of Civil Rights [OCR], etc.) may review your records.

Voluntary Participation /Withdrawal:

Taking part in this study is voluntary. You may choose to not allow your child to take part in this study, or if you do decide to allow your child to take part, you can change your mind later and withdraw him/her from the study. Your child is free to not answer any questions or withdraw at any time. Your decision will not change any present or future relationships with Wayne State University or its affiliates or other services you are entitled to receive. The investigator may stop your child's participation in this study without your consent.

Questions:

If you have any questions now or in the future, or if you think that you need to report a research related injury, you may contact Mrs. Imasa or one of her research team members at (586) 945-3388. If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628.

Participation:

By allowing your child to complete the study questionnaires you are agreeing to allow your child to participate in this study.

If you have no objection to your child participating in this study, you do not have to return this form. If you do not contact the principal investigator within fourteen days, your child will be enrolled into the research. However, if you do not want your child to participate, please contact the principal investigator within fourteen days to state that you do not give permission for your child to be enrolled in the research study. You may refuse participation by sending an e-mail to leaanimasas@gmail.com. You can also reach Mrs. Imasa directly at (586) 945-3388 to let her know that you do not want your child to participate in the study. You may also cut off the sheet below and return it to the school's office.

 I do not allow my child to participate in the research study.

Student's full name: _____

Parent's printed name: _____

 Parent signature

APPENDIX D

Documentation of Adolescent Assent Form

(Ages 11-14)

Title: The Moderating Role of School Climate in Adolescent Test Anxiety

Study Investigator: Lea Ann Imasa

Why am I here?

This is a research study. Only people who choose to take part are included in research studies. You are being asked to take part in this study because you are a student at Algonquin Middle School, and the researcher is interested in your responses. Please take time to make your decision. Be sure to ask questions about anything you don't understand.

Why are they doing this study?

This study is being done to find out why some students experience test anxiety (feelings of nervousness or fear about taking tests) more than others.

What will happen to me?

Your participation consists of completing a packet of questionnaires that include:

1. Questions to obtain information about your age, grade, gender, and the kinds of grades you receive in school.
2. Questions about test anxiety (fearful or worrisome thoughts or feelings when taking tests).
3. Questions about certain aspects of temperament, or personality characteristics, that are sometimes referred to as "will power."
4. Questions about academic self-concept, or how sure you feel about your ability to do well in school.
5. Questions about how threatening or stressful you think it is to take tests in school.
6. Questions about the emotional climate ("feel," or "vibe") of your school.

All students who are participating in the study will be asked to do so during class. Your participation will occur during the school day and take approximately one class period. During this time, you will complete the packet of questionnaires listed above. If you choose not to participate, you will be asked to go to an alternate classroom and work on an activity of your choice, such as finish homework or read a book.

Even if your parent/guardian gave permission for your participation, you are not required to participate if you do not want to, and you may stop part way through with no consequences.

Additionally, if you choose, you can skip any questions that you do not feel comfortable answering.

How long will I be in the study?

You will be in the study for one class period (approximately 50 minutes).

Will the study help me?

We cannot promise you that being in this research study will help you; however, information from this study may help other people now or in the future.

Will anything bad happen to me?

In the unlikely event that you experience negative feelings from your participation in the study, you can see the school counselor.

You may perceive a loss of confidentiality due to your participation with other students in the class. This means that you may feel that other students have learned things about you that you wanted to keep private. To prevent this, please do not discuss your survey responses among other participating students or with students who did not participate in the study.

Will I get paid to be in the study?

You will not receive any money for taking part in this study. However, for taking part in this research study, you will be given a candy bar and a raffle ticket after you turn in your completed study questionnaires. After the study is over, four raffle tickets will be chosen randomly, and those students will receive a \$25 gift certificate to Best Buy or iTunes. Your chances of winning a gift card will be approximately 1 in 75.

Do my parents or guardians know about this?

Information about this study has been given to your parents/guardian. They had the option of responding if they did not want you to participate.

What about confidentiality?

Every reasonable effort will be made to keep your information confidential (private). Your name will not be written on any of the study materials.

We will keep your records private unless we are required by law to share any information. The law says we have to tell someone if you provide us with information that suggests that you might hurt yourself or someone else.

What if I have any questions?

For questions about the study please call Lea Ann Imasa at (586) 945-3388. If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628.

Do I have to be in the study?

You don't have to be in this study if you don't want to or you can stop being in the study at any time. No one will be angry if you decide to stop being in the study.

AGREEMENT TO BE IN THE STUDY

Your signature below means that you have read the above information about the study and have had a chance to ask questions to help you understand what you will do in this study. Your signature also means that you have been told that you can change your mind later and withdraw if you want to. By signing this assent form you are not giving up any of your legal rights. You will be given a copy of this form.

Signature of Participant (13 yrs & older)

Date

Printed name of Participant (13 yrs & older)

**Signature of Witness (When applicable)

Date

Printed Name of Witness

Signature of Person who explained this form

Date

Printed Name of Person who explained form

** Use when participant has had consent form read to them (i.e., illiterate, legally blind, translated into foreign language).

APPENDIX E



EAGLES

ALGONQUIN MIDDLE SCHOOL

19150 Briarwood
Clinton Township, MI 48036

(586) 723-3500

CHIPPEWA VALLEY SCHOOLS

Mr. Walter A. Kozlowski, Principal
Mr. Christopher Gardner – Assistant Principal

January 14, 2011

Lea Ann Imasa
Doctoral Candidate, Wayne State University
2203 McDonald Ave
Royal Oak, Michigan 48073

Dear Lea Ann Imasa,

This letter is to confirm that I have agreed to allow you to collect data from students at Algonquin Middle School for your dissertation research examining the factors related to test anxiety. I understand that participating students will be completing several questionnaires measuring factors including effortful control, academic self-concept, academic performance, perceived threat of tests, parental expectations, and school climate. I have been informed that students will have the opportunity to decline or discontinue participation at any time. I understand the risks and benefits to students associated with such research, as well as the procedure for selection of participants and methods of ensuring confidentiality.

Sincerely,

Walt Kozlowski
Building Principal
Algonquin Middle School

NOTICE OF NONDISCRIMINATION It is the policy of Chippewa Valley Schools not to discriminate on the basis of race, color, religion, national origin or ancestry, gender, age, disability, height, weight or marital status in its programs, services, activities, or employment. Inquiries related to nondiscrimination policies should be directed to: Civil Rights Coordinator, Assistant Superintendent of Human Resources, Chippewa Valley Schools Administration, 19120 Cass Avenue, Clinton Township, MI 48038 Phone: 586-723-2090 / Nondiscrimination inquiries related to disability should be directed to: Section 504 Coordinator, Director of Soecial Services. (same address) Phone: 586-723-2180

APPENDIX F

WAYNE STATE
UNIVERSITY

HUMAN INVESTIGATION COMMITTEE
87 East Canfield, Second Floor
Detroit, Michigan 48201
Phone: (313) 577-1628
FAX: (313) 993-7122
http://hic.wayne.edu

FILE



NOTICE OF EXPEDITED AMENDMENT APPROVAL

To: Lea Imasa
Theoretical & Behavior Foundations
2203 McDonald Ave

From: Dr. Scott Millis *Neva Nahan*
Chairperson, Behavioral Institutional Review Board (B3) *SM*

Date: May 11, 2011

RE: HIC #: 029211B3E
Protocol Title: The Moderating Role of School Climate in Adolescent Test Anxiety
Funding Source:
Protocol #: 1102009450

Expiration Date: April 14, 2012

Risk Level / Category: 45 CFR 46.404 - Research not involving greater than minimal risk

The above-referenced protocol amendment, as itemized below, was reviewed by the Chairperson/designee of the Wayne State University Institutional Review Board (B3) and is APPROVED effective immediately.

- Revised data collection instrument (The Moderating Role of School Climate in Adolescent Test Anxiety)

**WAYNE STATE
UNIVERSITY**

HUMAN INVESTIGATION COMMITTEE
87 East Canfield, Second Floor
Detroit, Michigan 48201
Phone: (313) 577-1628
FAX: (313) 993-7122
http://hic.wayne.edu



NOTICE OF EXPEDITED APPROVAL

To: Lea Imasa
Theoretical & Behavior Foundations
2203 McDonald Ave

From: Dr. Scott Millis K. Tonso, PhD / la
for Chairperson, Behavioral Institutional Review Board (B3)

Date: April 15, 2011

RE: HIC #: 029211B3E
Protocol Title: The Moderating Role of School Climate in Adolescent Test Anxiety
Funding Source:
Protocol #: 1102009450

Expiration Date: April 14, 2012

Risk Level / Category: 45 CFR 46.404 - Research not involving greater than minimal risk

The above-referenced protocol and items listed below (if applicable) were **APPROVED** following *Expedited Review* Category (#7)* by the Chairperson/designee for the Wayne State University Institutional Review Board (B3) for the period of 04/15/2011 through 04/14/2012. This approval does not replace any departmental or other approvals that may be required.

- Protocol Summary Form, revised and received 4-4-11.
- Recruitment Script
- Assent Form, dated 3/28/11
- Parental Research Information Sheet, dated 3/28/11

- Federal regulations require that all research be reviewed at least annually. You may receive a "Continuation Renewal Reminder" approximately two months prior to the expiration date; however, it is the Principal Investigator's responsibility to obtain review and continued approval **before** the expiration date. Data collected during a period of lapsed approval is unapproved research and can **never** be reported or published as research data.
- All changes or amendments to the above-referenced protocol require review and approval by the HIC **BEFORE** implementation.
- Adverse Reactions/Unexpected Events (AR/UE) must be submitted on the appropriate form within the timeframe specified in the HIC Policy (<http://www.hic.wayne.edu/hicpol.html>).

NOTE:

1. Upon notification of an impending regulatory site visit, hold notification, and/or external audit the HIC office must be contacted immediately.
2. Forms should be downloaded from the HIC website at **each** use.

*Based on the Expedited Review List, revised November 1998

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ABSTRACT**AN EXAMINATION OF THE ROLE OF SCHOOL CLIMATE IN ADOLESCENT
TEST ANXIETY**

by

LEA ANN IMASA**May 2012**

Advisor: Dr. Cheryl Somers
Major: Educational Psychology
Degree: Doctor of Philosophy

The purpose of this study was to examine intrapersonal and contextual variables in relation to test anxiety among adolescents. Participants (n=298) were students in grades seven and eight from a middle school in a suburb in southeastern Michigan. Academic self-concept was found to fully mediate the relation between academic performance (as measured by GPA) and test anxiety. The intrapersonal variables of perceived threat of tests, effortful control, and academic self-concept significantly predicted test anxiety. The contextual variables were unrealistic parental expectations and school climate. Unrealistic parental expectations was a predictor of test anxiety in a regression model including only those two contextual variables, but was no longer a significant predictor when all study variables were included. School climate was not found to significantly predict test anxiety, nor did it serve the hypothesized role of moderating the relation of effortful control and test anxiety. The study provides support for the importance of intrapersonal variables in predicting test anxiety among adolescents.

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