Georgia State University
ScholarWorks @ Georgia State University

Counseling and Psychological Services Dissertations

Department of Counseling and Psychological Services

5-17-2013

Academic Stress, Test Anxiety, and Performance in a Chinese High School Sample: The Moderating Effects of Coping Strategies and Perceived Social Support

Juan Xiao

Follow this and additional works at: http://scholarworks.gsu.edu/cps_diss

Recommended Citation

Xiao, Juan, "Academic Stress, Test Anxiety, and Performance in a Chinese High School Sample: The Moderating Effects of Coping Strategies and Perceived Social Support." Dissertation, Georgia State University, 2013.
http://scholarworks.gsu.edu/cps_diss/88

This Dissertation is brought to you for free and open access by the Department of Counseling and Psychological Services at ScholarWorks @ Georgia State University. It has been accepted for inclusion in Counseling and Psychological Services Dissertations by an authorized administrator of ScholarWorks @ Georgia State University. For more information, please contact scholarworks@gsu.edu.

ACCPTANCE

This dissertation, ACADEMIC STRESS, TEST ANXIETY, AND PERFORMANCE IN A CHINESE HIGH SCHOOL SAMPLE: THE MODERATING EFFECTS OF COPING STRATEGIES AND PERCEIVED SOCIAL SUPPORT, by JUAN "TULIP" XIAO, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree Doctor of Philosophy in the College of Education, Georgia State University.

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

_____
Joel Meyers, Ph.D.
Committee Chair

_____
Ann C. Kruger, Ph.D.
Committee Member

_____
Don E. Davis Jr., Ph.D.
Committee Member

_____
Yali Zhao, Ph.D.
Committee Member

_____
Date

_____
Brian Dew, Ph.D.
Chair, Department of Counseling and Psychological Services

_____
Paul A. Alberto
Interim Dean
College of Education

AUTHOR STATEMENT

By presenting this dissertation as a partial fulfillment of the requirements for the advanced degree from Georgia State University, I agree that the library of Georgia State University shall make it available for inspection and circulation in accordance with its regulations governing materials of this type. I agree that permission to quote, to copy from, or to publish this dissertation may be granted by the professor under whose direction it was written, by the College of Education's Director of Graduate Studies, or by me. Such quoting, copying, or publishing must be solely for scholarly purpose and will not involve potential financial gain. It is understood that any copying from or publication of this dissertation which involves potential financial gain will not be allowed without my written permission.

_____

Juan "Tulip" Xiao

NOTICE TO BORROWERS

All dissertations deposited in the Georgia State University library must be used in accordance with the stipulations prescribed by the author in the preceding statement. The author of this dissertation is:

Juan “Tulip” Xiao
5330 Ivy Nole
Cumming, GA 30040

The director of this dissertation is:

Dr. Joel Meyers
Department of Counseling and Psychological Services
College of Education
Georgia State University
Atlant, GA 30303-3980

VITA

Juan "Tulip" Xiao

ADDRESS: 5330 Ivy Nole
Cumming, Georgia 30040

EDUCATION:

Ph.D.	2013	Georgia State University School Psychology
Ed.S.	2010	Georgia State University School Psychology
M.Ed.	2004	Georgia Southern University School Psychology
B.A.	1995	Hunan Normal University Psychology Education

PROFESSIONAL EXPERIENCE:

2004-Present	Graduate Research Assistant Georgia State University, Atlanta, GA
2002-2004	Graduate Research Assistant Georgia Southern University, Statesboro, GA
1995-2002	Instructor Yueyang University, Yueyang, Hunan Province, China

PRESENTATIONS AND PUBLICATIONS:

Xiao, J. (2010). The Effects of A Life Skills Training at a Southern University in China. Poster presentation at the Anuual Conference of Chinese Psychological Society. Shanghai, P.R. China.

Tang, Z.J., Chen, Y.H., & Xiao, J. (2010). Using The Classic Grounded Theory Approach To Understand Consumer Purchase Decision In Relation To The First Customized products. *The Journal of Product & Brand Management*, Volume 19, Summer/Fall 2010.

Xiao, J. (2009). School Bullying and Coping in an Elementary School in the United States. Poster presentation at the Annual Conference of Chinese Psychological Society. Jinan, Shangdong, P.R. China.

Xiao, J. (2008). Strategies for Coping with School Bullying: The Effect of Different Gender, Age, and Bullying Status Type. Paper presentation at the Georgia Psychological Association Spring Conference, St. Simons, GA.

Xiao, J. (2007). Bully in schools [white paper, electronic version]. Georgia State University Center for School Safety, School Climate and Classroom Management website: http://education.gsu.edu/schoolsafety/.

PROFESSIONAL SOCIETIES AND ORGANIZATIONS:

2005-Present	Student Affiliates of School Psychology
2005- Present	National Association of School Psychologist

ABSTRACT

ACADEMIC STRESS, TEST ANXIETY, AND PERFORMANCE IN A CHINESE HIGH SCHOOL SAMPLE: THE MODERATING EFFECTS OF COPING STRATEGIES AND PERCEIVED SOCIAL SUPPORT

by

Juan "Tulip" Xiao

Test taking can produce elevated stress and anxiety, with subsequent negative influences on test performance. This has been a focus of prior research. However, only a few studies have explored how coping strategies and perceived social support affect relationships between academic stress, test anxiety, and test performance particularly in China. Therefore, this study investigated relationships among academic stress, test anxiety, coping strategies, perceived social support and test performance in a Chinese high school sample. Specifically, this study tested the moderating effects of coping strategies and perceived social support on the relationships between academic stress, test anxiety, and test performance. Four hundred and fifty Chinese high school students completed four surveys: 1) Test Anxiety Inventory (TAI; Spielberger et al., 1980) - Chinese Version, 2) Academic Stress Scale (ASS; Kohn & Frazer, 1986)-Chinese Version, 3) Simplified Coping Styles Questionnaire (SCSQ; Xie, 1998), and 4) A revised Chinese version of the Multi-dimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1998). Scores from the pre-National College Entrance Exam (pre-NCEE) were obtained from the school. Hierarchical multiple regressions indicated that academic stress was positively related to students' test anxiety and negatively related to their academic test performance. Test anxiety had a negative relationship to test performance. While active coping was not found to moderate the relationships among academic stress, test anxiety, and academic performance, perceived parent support and perceived other support moderated the relationships between test

anxiety and test performance as well as between academic stress and test anxiety. These moderation effects were in a different direction than predicted as there were stronger relationships between test anxiety and test performance, and between academic stress and test anxiety, when students reported higher levels of perceived parent support or other support. This study contributes to the research literature by exploring the integrative relationships among academic stress, test anxiety, test performance, coping strategies, and perceived social support. Findings of this study and related literature are considered for public policy and the design of training programs aimed at assisting Chinese high school students cope with academic stress and test anxiety.

ACADEMIC STRESS, TEST ANXIETY, AND PERFORMANCE IN A CHINESE HIGH SCHOOL SAMPLE: THE MODERATING EFFECTS OF COPING STRATEGIES AND PERCEIVED SOCIAL SUPPORT

by
Juan "Tulip" Xiao

A Dissertation

Presented in Partial Fulfillment of Requirements for the
Degree of
Doctor of Philosophy
in
School Psychology
in
the Department of Counseling and Psychological Services
in
the College of Education
Georgia State University

Atlanta, GA
2013

Copyright by
Juan Xiao
2013

ACKNOWLEDGMENTS

This dissertation would not have been possible without the support and mentorship of many people. I would like to express my appreciation to my committee members, Dr. Joel Meyers, Dr. Don Davis, Dr. Ann Kruger, and Dr. Yali Zhao.

I would also like to convey my love and gratitude to my beloved families, my husband, daughters and son, parents and parents-in-law, for your understanding and endless love and support through the duration of my study at Georgia State University.

TABLE OF CONTENTS

Page

List of Tables IV
List of Figures V
Abbreviations VI

Chapter
1 ACADEMIC STRESS AMONG CHINESE STUDENTS: A CONTEXTUAL PERSPECTIVE 1
Introduction 1
Background: Chinese Culture and Education System 3
Literature Review of Research on Academic Stress 11
Implications for Research, Policy, and Practice 20
References 29

2 ACADEMIC STRESS, TEST ANXIETY, AND PERFORMANCE IN A CHINESE HIGH SCHOOL SAMPLE: THE MODERATING EFFECTS OF COPING STRATEGIES AND PERCEIVED SOCIAL SUPPORT 40
Introduction 40
Theoretical Background and Hypotheses 43
Methods 54
Results 61
Discussion 73
Limitations and Directions for Future Research 78
References 80

Appendixes 89

LIST OF TABLES

Table		Page
1	Actual Eigenvalues and Random Eigenvalues of the Factors	62
2	Intercorrelations among Main Variable	64
3	Hierarchical Regression Analysis for Moderating Effects of Active Coping Strategies on the Relationship between Academic Stress and Test Anxiety	65
4	Hierarchical Regression Analysis of Academic for Moderating Effects of Active Coping Strategies on the Relationship between Academic Stress and Test Performance	65
5	Hierarchical Regression Analysis of Academic for Moderating Effects of Active Coping Strategies on the Relationship between Test Anxiety and Test Performance	65
6	Hierarchical Regression Analysis of Academic for Moderating Effects of Perceived Parent Support on the Relationship between Test Anxiety and Test Performance	66
7	Hierarchical Regression Analysis of Academic for Moderating Effects of Perceived Other Support on the Relationship between Test Anxiety and Test Performance	67
8	Hierarchical Regression Analysis for Moderating Effects of Perceived Parent Support on the Relationship between Academic Stress and Test Anxiety	69
9	Hierarchical Regression Analysis for Moderating Effects of Perceived Other Support on the Relationship between Academic Stress and Test Anxiety	70
10	Hierarchical Regression Analysis for Moderating Effects of Perceived Parent Support on the Relationship between Academic Stress and Test Performance	72
11	Hierarchical Regression Analysis for Moderating Effects of Perceived Other Support on the Relationship between Academic Stress and Test Performance	73

LIST OF FIGURES

Figure		Page
1	Moos' Transactional Model.	22
2	Conceptual Framework of Relationship between Academic Stress, Test Anxiety, Test Performance, and Active Coping Strategies	49
3	Conceptual framework of relationship between academic stress, test anxiety, test performance, and perceived social support (parent support and other support)	52
4	Moderating Role of Parent Support on the Relationship between Test Anxiety and Test Performance	68
5	Moderating Role of Other Support on the Relationship between Test Anxiety and Test Performance	69
6	Moderating Role of Parent Support on the Relationship between Academic Stress and Test Anxiety	71
7	Moderating Role of Other Support on the Relationship between Academic Stress and Test Anxiety	72

ABBREVIATIONS

AESI	Academic Expectations Stress Inventory
ASS	Academic Stress Scale
FA	Factor Analysis
HSSS	High School Stressor Scale
HSSSS	High School Students' Stressors Scale
IRB	Institutional Review Board
MSPSS-C	Multi-dimensional Scale of Perceived Social Support-Chinese Version
MSSASQ	Middle School Student Academic Stress Questionnaire
NCEE	National College Entrance Exam
SCSQ	Simplified Coping Styles Questionnaire
SHIQ	Student Health Investigation Questionnaire
SSIA	School Stressor Inventory for Adolescents
SSS	Student Stressor Survey
SSSASQ	Secondary School Students' Academic Stressors Questionnaire
TAI	Test Anxiety Inventory
TAS	Test Anxiety Scale
WCQ	Ways of Coping Questionnaire

CHAPTER 1

ACADEMIC STRESS AMONG CHINESE STUDENTS: A CONTEXTUAL PERSPECTIVE

Introduction

Academic stress can be conceptualized as a student's interactions between environmental stressors, the student's cognitive appraisal of and coping with the academic-related stressors, and psychological or physiological response to the stressors (Lee & Larson, 2000; Lou & Chi, 2000). Academic stress is a pervasive problem across countries, cultures, and ethnic groups, and must be viewed in its context (Wong, Wong, & Scott, 2006). In Chinese society, academic stress is particularly severe because Chinese are expected to pursue academic success to achieve respect, family pride, and social mobility (Gow, Bella, Kember, & Hau, 1996), resulting in extremely high academic demands and extraordinary pressure on school-aged children and adolescents (e.g., Bossy, 2000; Ho, 1996). The Chinese education system and its high stakes testing (e.g., the National College Entrance Exam [NCEE]), may exacerbate the competitive academic climate and generate high levels of academic stress. Frequently, learning has been described by Chinese students as a "joyless" experience due to "endless", "stressful", and "demanding" academic life (Liu, 2009).

Empirical research on academic stress has been conducted in China for only two decades (e.g., Ge, 2008; Li, 2010). Reviews of research literature have shown that limited studies have examined academic stress in China from a contextual perspective. Specifically, very few studies have investigated how contextual factors (e.g., culture, ethnicity, social networks) affect Chinese students' academic stress and coping.

Similarly, there has been little research examining Chinese students' academic stressors and coping strategies in the context of their social-cultural background. Thus, the primary goal of this paper is to examine academic stress and coping in China to help understand how academic stress affects Chinese students and how these relationships are influenced by contextual variables. This may be particularly important because it is believed that contextual factors including cultural, ethnic, familial, educational, and social variables contribute significantly to academic stress and related coping strategies for students from different backgrounds. It should be of interest for education policy makers in China to enhance their understanding of Chinese students' academic stress and coping and to develop ideas about how to best utilize and manage the education system to promote the optimum academic performance and emotional development of students in China. Another goal of this paper is to establish a conceptual framework that includes the links between academic stress and coping in Chinese culture. This should be useful in guiding future researchers to conduct studies in the area of academic-related stress and coping in China.

In the present paper, the following questions are posed to help understand academic stress in Chinese society: (1) What features of Chinese collectivism-oriented culture are relevant to academic stress? (2) How do interpersonal relationships, education, the national examination system, and school policies in China influence the academic stress of Chinese students? (3) What are the features of Chinese students' academic stressors? (4) What are the features of Chinese students' coping strategies in response to academic stress? (5) How do Chinese researchers assess students' academic stress? (6) What are the research limitations? In the end, the research, policy, and practice

implications are discussed, and a research agenda is presented to address the above questions using a contextual approach.

Background: Chinese Culture and Education System

Chinese Collectivism-Oriented Culture

Numerous cultural values have been proposed to describe the similarities and differences of cultures; collectivism and individualism are the most widely studied of these values (for a review, see Oyserman, Coon, & Kemmelmeier, 2002). China is an example of collectivism-oriented culture (Hofstede, 1991). It features group-centered society with the emphasis on duty and obligations to the group, interdependence among individuals within the group, and fulfillment of social roles (e.g., female role as a mother and wife which is subordinate to male; Wong & Wong, 2006). In contrast, an individualism-oriented culture, such as the United States, features self-centered society with the emphasis on individual rights, a concern for oneself and immediate family, and personal autonomy and self-fulfillment (Wong & Wong, 2006).

Cultural orientation and cultural value systems have profound implications for the ways in which people perceive, experience, express, and respond to stress. In academic settings, for instance, the collectivism-oriented Chinese students normally react to academic failure with shame, embarrassment, or disgrace to oneself and one's parents and family (Wang & Ollendick, 2001). They tend to avoid formally speaking about an academic problem or stressor because the problem or stressor is perceived as a burden to others (Yeh, Carter, & Pieterse, 2004). In contrast, students in an individualism-oriented culture (e.g., United States) generally view academic failure as a missed opportunity or an obstruction to attaining goals resulting in feelings of frustration and disappointment

(Mortenson, 2001). In Western cultures, seeking assistance from other people for an academic problem or stressor are culturally appropriate to cope with academic failure.

Interpersonal Relationship

The collectivism-oriented Chinese culture has been largely influenced by Confucianism, which emphasizes social order and education (Yang, 1981 & 1986). According to Confucian values, Chinese child-rearing practices emphasize diligence and achievement, moderation and self-control, interdependence and harmony, respect for authority and the elders, and obedience and conformation to one's prescribed relational role (Tseng & Wu, 1985). At young age, Chinese children are inculcated with strong family values and the belief that family and kinship relations are fundamental to happiness in life (Ho, 1986). These collectivism-oriented values have a significant impact on people's interpersonal relationships, which consequently affect school-aged children's academic learning. For example, filial piety, a respect for the parents and ancestors, is a highly valued cultural virtue among the Chinese. Striving for and attaining academic success is a way for school-aged children and adolescents to demonstrate their filial piety (Li, 2004).

Additionally, a high level of parental involvement and control is typical in a Chinese family. Chinese parents are active participants in their child's education. They have high expectations and set high standards for their children's academic performance. According to an investigation by the Chinese Youth Research Center (2009), 91.7% of Chinese parents expected their children to obtain a college degree or higher, 54% of parents expected their children to obtain a doctoral degree, 83.6% of parents of secondary school children expected their children to achieve the top 15 in class ranking, and 76.4%

of parents of primary school children expected their children to achieve A for each test. With the high expectations, Chinese parents put great emphasis on their children's academic activities. They spend a large amount of time supervising and assisting their children with school-work (Huang &Waxman, 1995; Liu, 2009; Jia, 2011; Jiang, 2007; Li, 2004). For example, most Chinese parents enroll their children in after-school educational activities, such as private elite tutoring to advance their academic achievements, even though some of their children are not "struggling" academically (Cho, 1995; Verma, Sharma, & Larson, 2002). Some educated parents take the responsibility to tutor their children at home every night. Beyond these academic involvements, Chinese parents provide supports for every aspect of their children's lives. For instance, to help their children prepare for the high-stakes exams, such as the NCEE, many parents take a long leave from work (3 to 6 months before NCEE) and serve as a full-time housekeeper, assisting and supervising their children's study, and taking care of their daily life (Jia, 2011; Jiang, 2007; Li, 2004; Liu, 2009). Some parents even rent an apartment closer to their children's school to provide a better and convenient study environment (Wang, 2012).

Education and the Examination System in China

Chinese culture is known for its emphasis on education and learning. For centuries, Chinese people have believed in the value of education for the nation's well-being as well as for their own personal advancement (Ying, 2011). Education plays an important role in the life of the Chinese people as a ladder for upward mobility (Leung, Yeung, & Wong, 2010). However, higher education has not been possible for every high school graduate due to space limitations, and the fact that only about 20% to 40% of high

school graduates obtain the opportunity to enter higher education each year (Liu & Dunne, 2009). This highly competitive atmosphere results in extraordinary pressure for high school students in China, and this affects the Chinese education system.

There are three types of schools in the Chinese education system: ordinary schools, key schools, and private schools, with the former two being public schools. These three types of schools have been developed in China to meet the academic needs of students with varied capacities and different levels of family economic status. Compared with ordinary schools, key schools are equipped with better teachers, more funding, and a better learning environment, making these schools more attractive for academically advanced and highly motivated students. The college entrance exam promotion rates of the key high schools are much higher than for ordinary schools (Liu & Dunne, 2009). Further, the average college promotion rates for key high schools have been reported in the range of 40% to 80%, whereas the average promotion rates for the ordinary high schools have been recorded in the range of 10% to 30% (Liu & Dunne, 2009). Because of the cultural stress on educational achievement and the higher college promotion rates at key schools, students are under great pressure from the beginning of their school career to be high achievers who will enter a key middle school, a key high school, and then a key university.

Additionally, the traditional examination-oriented education system in China has affected schools' academic activities and may exacerbate students' academic stress. The National College Entrance Exam (NCEE) in contemporary China is the most critical examination (Feng, 1995) because performance on the NCEE is crucial for seeking admission for higher education at universities and colleges; in turn, higher education

provides access to prestigious careers. Due to its critically important role in the education system (Zhang, 1995), the NCEE has largely influenced the nation's school pedagogy. Schools have shaped their curriculum coverage to focus on the examination subjects. Schools have also extended the school hours to enhance performance on this exam (Liu & Dunne, 2009), and concomitantly, more pressure has been put on students, parents, and teachers for students' academic success. For instance, the reputation of "a high school" or "a high school teacher" has been determined based on the number of students who passed the NCEE and entered college (Lewin & Xu, 1989). This has led to a situation in which the aim of teaching in China is to prepare students to pass the NCEE rather than to develop their abilities (Liu & Dunne, 2009).

Beyond the NCEE, elementary and secondary school students in China are required to take four school-wide exams (2 midterms and 2 final exams) per school year to be promoted to the next grade. At the end of the 6- (middle school entrance exam), 9- (high school entrance exam), and 12-year period (the NCEE), students typically take a school board exam (either statewide or nationwide), which is prepared, administered, and graded by the state. The performance on these exams directly determines a student's promotion and placement at an ordinary or key middle/high school, an ordinary or key (top) university, or no further education. Under this type of examination-oriented and highly competitive education system, Chinese students have experienced considerable pressure and have been trained to be high-achievers on exams at all cost and from a young age.

Reducing Academic Stress in China: Policy Changes from 1949 to Today

Excessive academic workloads and academic stress are severe obstacles in the Chinese education system. Since the People's Republic of China was established in 1949, the Chinese government has launched a series of educational policies to reduce students' academic workloads as well as students' academic stress. The first attempts were made during the 1950s. In 1951, the Chinese Central Administration Department launched "the Decision to Improve Students' Health", which aimed to reduce students' academic workloads and stresses, and improve students' mental and physical health (Gu, 2004). In 1955, the Chinese Education Department launched "the Decision to Reduce the Academic Workloads of Primary and Secondary School Students". This policy clearly suggested that primary and secondary schools should reduce excessive after-school workloads and academic stresses, improve extracurricular opportunities, and strictly follow the schools' study and recess time schedule (Gu, 2004).

During the 1960s, the Chinese government made additional attempts to reduce students' academic workloads and improve their health. For example, in 1960, the Central State Council of the Communist Party of China launched "the Decision to Improve Students' and Teachers' Physical and Mental Health", which emphasized the importance of enough sleep and rest time, and stipulated that the study time for secondary school students should be less than 8 hours each day (Gu, 2004). In 1964, the Education Department published "the Reports of Overcoming the Excessive Academic Workloads of the Primary and Secondary Students and Improving Teaching Quality". This report clearly pointed out three contributions to the heavy academic workloads among students at primary and secondary schools: excessive curriculum subjects, homework, and

examinations (Gu, 2004). In July of the same year, the Education Department launched another policy and required the schools at all levels to adjust school curriculum subjects appropriately and reduce the total study hours each week (Gu, 2004).

The last two decades of the 20th century included significant educational reform efforts in China resulting in a series of educational policies to reduce academic stress and to improve education quality. In 1983, the Education Department launched "Ten Stipulations to Correct One-sided Pursuit of School Promotion Rate", which made suggestions to reduce students' academic workloads and ensure that students would have enough time to sleep, rest, and entertain (Gu, 2004). In 1985, the Central State Council published "the Report of Education System Reform", which was a milestone for the Chinese Education System. This reform sought to eliminate the examination-oriented education system and establish a quality-oriented and student-centered education system (Gu, 2004). In 1994, the Education Department launched "the Suggestions to Carry out Educational Policies and Reduce Students Excessive Academic Workloads", which emphasized the need to overcome students' excessive academic workloads brought by the examination-oriented education system (Gu, 2004).

At the beginning of the 21st century, increasing efforts have been made by the Chinese government and Education Department to improve students' mental and physical health. In 2001, the Central State Council launched "the Decision in Regard to Primary and Secondary Education Reform and Development", which reemphasized the need to reduce the primary and secondary students' excessive academic workloads and improve students' mental and physical health (Gu, 2004). In 2004, the Education Department launched a decision entitled "Five Prohibitions" (Gu, 2004). The first one prohibits

schools at all levels from using school promotion rate as the only criterion to judge the teaching quality of a school. The second prohibits the school-based entrance examination in the primary and secondary public school system and suggests enrolling students based only on the students' registered permanent residence. The third one prohibits schools from increasing curriculum subjects and in-school study hours to improve schools' promotion rate. The fourth prohibits schools from using students' after-school time to make a remedial teaching. The fifth prohibits class or school from developing ranking based on academic performance, such as examination score. In 2010, the Central State Council published another critical report, which is the "National Platform for Medium and Long-term Educational Reform and Development Plan". This report pointed out that it is the responsibility of the whole society (e.g., mass media) to support educational reform and to help reduce the students' excessive academic workloads (Gu, 2004).

Although a series of educational policies have been launched to reduce students' academic stress in China over the years and the quality-oriented and student-centered education reforms have been established in the 1980s, these policies and reforms have had limited impact on school teaching and student learning (Liu & Dunne, 2009), and students' workloads and academic stressors are still heavy. For years, the Chinese government took a series of actions to advocate for quality-oriented education reform and the reduction of students' workloads and academic stressors. The government forbade the schools at all levels from increasing extracurricular activities and study time. The government forbade class and school ranking, and stipulated that middle school entrance criteria should be based on students' registered permanent residence not on examination ranking. However, because a selective examination system is still in place, all educational

activities are still subordinated to examination requirements. Schools and teachers continue to increase students' study time and extracurricular activities because they believe that increased study time and academic workloads are the important ways to guarantee the promotion rate. Schools and teachers are not willing to sacrifice promotion rate to reduce academic workloads and to use new teaching methodologies because they believe that promotion rate is the most important factor for school development (Liu & Dunne, 2009).

Literature Review of Research on Academic Stress

The Chinese traditional collectivism-oriented culture and examination-oriented education system result in excessive academic demands and stresses on Chinese students. For a better understanding the phenomenon of academic stress, Chinese researchers have studied academic stress from varied aspects during the past two decades. In this section, the researches on academic stressors, coping strategies, and measurement will be reviewed, with an emphasis on how they related to the contextual factors.

Research on Academic Stressors

Academic stressors refer to any academic demands (e.g., environmental, social, or internal demands) that cause a student to adjust his or her behavior (Thoits, 1995). Academic stressors are natural events in a student's life that affect students' academic performance and mental health. Normally, examinations, excessive homework, time issues, and peer competition are accepted as universal academic stressors that can be generalized to all cultures (Cheng, Leong, & Geist, 1993). For example, a great number of research findings in both Western countries and China have found that examination is the most common source of stress for students (e.g., Abouserie, 1994; Aldwin &

Greenberger, 1987; Gallagher & Millar, 1996; Kyriacou & Butcher, 1993; Liu et al., 1998; Zhen, Wan, & Li, 2001). Time management is another important universally accepted academic stressor that has been researched in both Western countries and China (e.g., Nonis, Hudson, Logan, & Ford, 1998; Wang, 2010).

There are some other academic stressors that are culturally specific. For instance, in Chinese culture, the majority of academic stressors may come from excessive expectations and demands from members of a group, such as family members (e.g., Ang & Huan, 2006). Most Chinese parents believe that education is the best route for upward mobility, and children's school success is a prime goal of parenting (Lee, 1997). Since filial piety has been highly valued in Chinese culture (Ho, 1998), children strive to be high achievers at school to demonstrate their filial piety. Children at a young age are socialized to be sensitive to the judgment of significant others, especially parents or teachers. Not meeting the expectations of significant others could potentially result in loss of face, loss of confidence and support from one's family, school, and even the community (Yeh & Huang, 1996). Consequently, high expectations and demands from parents, teachers, school and society, and children themselves become the major academic stressors in Chinese culture (Burnett & Fanshawe, 1997; Gu, 1999; Lay, Fairlie, Jackson, Ricci, Eisenberg, Sato, et al., 1998; Zhen, 1999). For example, Zhang and Du (2005) examined a sample of Chinese middle school students and found that the majority of academic stressors for Chinese middle school students included teachers' expectations, parents' expectations, and peer competition.

Some researchers have explored academic stressors in relationship to contextual factors, such as gender or school status (key or ordinary school). For example, Chen

(2004) found significant differences in parental expectations between female students and male students, with higher expectations for male students. One possible explanation is the traditional Chinese cultural values that: "Treat Woman as Inferior to Men (Zhong Nan Qing Nu)". Many Chinese parents believe that higher education is the only way for the boys to be successful, whereas the best way for the girls to live happily may not be a good education, but a good marriage (Yang, 2005). Additionally, Wang (2001) and Chen and Yao (1997) have explored academic stressors of students in "key" schools and "ordinary" schools. They found out that the reported parent expectations and student self-expectations in key schools were much higher than those in ordinary schools. Chen (2004) reported similar findings. One possible explanation was that the students in key schools are more academically advanced and highly motivated than those in ordinary schools. Those in key schools have higher self-expectations to compete with peers, to be high achievers, and to satisfy their parents and themselves academically.

Research on Coping Strategies in Response to Academic Stress

Lazarus and Folkman (1984) have defined coping as the cognitive and behavioral efforts an individual uses to manage specific demands or stressors. Many models have been developed to measure coping strategies. For example, the problem-focused and emotion-focused model (Folkman and Lazarus, 1980) has been a major influence on researchers across the world. Reviews of Chinese research literature revealed that many Chinese researchers have examined the structure of students' coping under general stressful life events. For instance, Huang (2000) explored middle school students' daily frustrations and worries and identified a six dimensional coping structure: problem solving, seeking support, withdrawal, catharsis, imaging, and endurance. Li and Zhang

(2004) examined middle school students' daily stressful life events and found a 4 dimensional coping structure: active problem solving, internal passive appraisal, external passive appraisal, and seeking social support. However, very few attempts have been made by Chinese researchers to study the structure of coping strategies in stressful academic settings. Only one study conducted by Chen (2004) was found that examined the structure of coping with academic stress. Chen (2004) analyzed middle and high school students' academic stress and coping. He identified a 3-dimensional coping model: passive coping, maintenance coping, and active coping. Passive coping strategies included withdrawal, imagining, ignoring, waiting, and catharsis. Maintenance coping strategies included self-adjustment, self-restraint, and replacement. Finally, active coping strategies included problem-solving, seeking support, cognitive reconstruction, and comparison. Given the limited research, there is clearly a need for further research on coping strategies used in response to academic stress by students in China.

A review of Chinese literature on students' coping strategies in a stressful academic situation has yielded mixed findings. Some studies suggested that Chinese students preferred to use avoidant coping (Chang, 1996a, 1996b, 2001; Cheung, Lee, & Chan, 1983; Trubisky, Ting-Toomey, & Lin, 1991), emotion-focused coping (Eshun, Chang, & Owusu, 1998; Feng & Zhou, 2002), and covert coping (McCarty et al., 1999). Although less common, some researchers found opposite patterns as some Chinese students intended to use "approach" or "problem-focused" coping to deal with academic stress (Chen, 2002). Given the contradictory findings, future research on coping strategies in stressful academic situations may be needed to account for the many potentially

influential factors, such as the different testing contexts, samples, instruments, and so forth, which may contribute to the contradictory results.

Pursuing a different research path, some have examined how the cultural contextual factors affect Chinese students' coping strategies in academically stressful situations. Cultural norms may direct a person's coping strategies so that in any particular culture, certain coping patterns and behaviors are encouraged, rewarded, and deemed appropriate while others are not (Lam & Zane, 2004; Lazarus & Folkman, 1984; Marsella & Dash-Scheuer, 1988). Chinese collectivism-oriented culture emphasizes group cohesion where individuals with an interdependent and connected sense of self have a desire for maintaining harmony and conforming to group norms (Chang, Chua, & Toh, 1997; Lam & Zane, 2004; Morling & Fiske, 1999; Weisz, Rothbaum, & Blackburn 1984). As a result, coping with stressful situations is likely to emphasize processes that focus on changing the self rather than changing the situation (Cross, 1995; Weisz et al., 1984; Yang, 1986). Examples of these indirect strategies include accepting the situation and changing one's own expectations or desires. In Chinese collectivist culture, some direct coping strategies may be viewed as immature or selfish and can threaten harmony in relationships (Cross, 1995). For example, Chinese students tend to avoid speaking about or formally reporting problems or difficulties since it is seen as burdening others (Yeh, Carter, & Pieterse, 2004). Seeking help from others such as a school counselor may be culturally inappropriate for a Chinese student from a collectivistic perspective (Yeh & Wang, 2000). Chen (1998) identified that in a stressful situation, only 3% Chinese adolescents seek support from others as the majority of Chinese adolescents prefer to solve the problem by themselves.

Some Chinese researchers have sought to determine how coping strategies vary as a function of contextual factors, such as gender, grade, school geographic location, school status (key or ordinary school), and so forth. For instance, Chen (2004) examined Chinese middle and high school students' coping strategies in a stressful situation and identified that Chinese female students reported significantly more passive coping strategies than male students who reported more active coping. The results also revealed that 10th grade students reported more active coping strategies than other graders whereas 7th graders used less active coping strategies than students from other grades. The use of coping strategies by students in different geographic locations and school types ("key" or "ordinary" school) was investigated by Chen (2004) and Liao (2007) who found out that Chinese rural students preferred to use "endurance (withstand the stress for a long time)" coping strategies when compared to city students who tended to use more "self-adjustment (change one's own emotions or behaviors to adapt to the environment)" to cope with academic stress. Chen (2004) also identified that Chinese middle and high school students in "key" schools reported more active coping strategies than those in "ordinary" schools who used more passive coping strategies.

Summarizing the findings from the Chinese literature of academic stress and coping, it is apparent that limited efforts have been taken to explore the structure of Chinese students' coping strategies and insufficient evidence has been found on how cultural contextual factors affect Chinese students' coping strategies in academically stressful situations. The studies discussed above report a number of specific comparisons on coping strategies vis-à-vis contextual factors such as gender, grade, school status label, and so forth; however, no further generalizations can be made from these studies.

This provides a good space for future researchers to investigate coping strategies from the perspective of diverse contextual factors, which may include parenting style, social economic status, and so forth.

Research on the Measurement of Academic Stress

While a number of questionnaires have been designed to assess stress, only a small number of instruments have been designed specifically to measure students' academic stress in the Western countries. The School Stressor Inventory for Adolescents (SSIA; Fanshawe & Burnett, 1991), the Academic Stress Scale (ASS, Kohn & Frazer, 1986), and High School Stressor Scale (HSSS; Burnett & Fanshawe, 1997) are three instruments found to assess students' academic stress in the Western research literature. Because the collectivism-oriented Chinese culture is different from the individualism-oriented Western culture, the direct translation of these instruments may not be a best fit for students in China. For example, some items in the ASS are not congruent with Chinese culture (e.g., the item "evaluating classmates' work" is not congruent with Chinese culture because the work of Chinese students is evaluated by teachers only). Thus, appropriate revision and adaptation are necessary when Chinese researchers attempt to translate and administer existing measures of academic stress in China.

Recently, Chinese researchers have created several surveys to assess students' academic stress that are congruent with Chinese culture. The Student Stressor Survey (SSS; Chen, 2004) designed by Chen (2004) was administered to a group of middle and high school students to explore the secondary school students' academic stressors and coping strategies and this research revealed 9 academic stressors: competition, frustration, workload, expectation, time, self-development, environment, and high

standards. The SSS has good reliability and validity and has been widely accepted by Chinese researchers to assess students' academic stress. Another instrument developed by Ye (2003) is the Middle School Student Academic Stress Questionnaire (MSSASQ). Seven academic stressors were identified in this study: academic performance, peers relationships, family, teacher, health, self-expectation, and social relationship. The MSSASQ has satisfactory validity and reliability.

Additionally, advances in research have led to the development of more precise approaches to the measurement of academic stress. For example, Ang and Huan (2006) developed the Academic Expectations Stress Inventory (AESI) to address the academic stress resulting from people's expectations regarding academic performance. This instrument is particularly useful because academic expectations play a critical role as a stressor related to students' academic performance in many Asian countries. Two subscales of the surveys are: self-expectations, and other-expectations (parent and teacher). The AESI and its subscales provide satisfactory statistical data measuring academic stress arising from the expectations of parents/teachers and self in middle and high school Asian adolescents (Ang & Huan, 2006). The AESI has been widely used by many Asian researchers, including those conducting research in China.

Limitations of the Research on Academic Stress

Based on the literature reviewed above, one important limitation of the research on academic stress is that contextual factors, including cultural, ethnic, interpersonal, and ecological factors, etc., have not been adequately analyzed to determine their impact on academic stress and coping. For example, among all of the studies reviewed in this paper, only four contextual variables were found that had been investigated to determine their

relationships with academic stress and coping: gender, grade, type of school ("key" or "ordinary" school) and the geographic location of the schools (rural or suburban). This research attempt ignores some demographic and ecological contextual variables. For instance, no study has been found to explore how the interpersonal relationship impact students' academic stress and coping, although the interpersonal relationship between parents and children is important for children's growth in all cultures and plays a critical role in a child's learning.

Another big problem associated with research on academic stress is a lack of a clear theory-driven contextual approach. Although some Chinese researchers have attempted to explore the nature of academic stress in relationship to some contextual factors, they have not systematically examined these variables using a theory-driven approach. Specifically, no theoretical model has been established in China to help understand the structure of academic stress and coping within the context of Chinese culture. Therefore, a critically important issue to guide a research agenda on these topics is to establish a cultural contextual framework for academic stress and coping.

Another significant limitation is that few instruments have been developed by Chinese researchers to assess academic stress and coping specifically. Most instruments assess stress in general, and academic stress is one component of these measurements. For example, "the Student Health Investigation Questionnaire (SHIQ)" has been created by Zhen (1999) in his study to investigate secondary school students' mental and physical health. SHIQ examines students' mental and physical health components, such as cognition, emotion, physical health, and personality. Academic stress is only one subscale of the instrument. SHIQ may be a good measurement when the research

attempts to explore the students' mental and physical health in general, but it is not an appropriate choice when a researcher intends to assess academic stress comprehensively. Additionally, the constructs measured by the instruments used in most studies on academic stress are different and examine distinct aspects of academic stress and coping. For example, the Secondary School Students' Academic Stressors Questionnaire (SSSASQ) has been created to investigate five academic stressors in the group of middle and high school students: assignment stress, frustration stress, competition stress, expectation stress, and self-development stress; whereas the High School Students' Stressors Scale (HSSSS: Liao, 2007) explored six academic stressors in the sample of high school students: assignment stress, stress from parents, competition stress, peer stress, teacher stress, and self-expectation stress. The construct of these two instruments are different and examines students' academic stressors at different age levels. Consequently, results of these studies may not be appropriate to be compared to each other. Future researchers should be cautious to choose instruments to examine academic stressors.

Implications for Research, Policy, and Practice

The aim of this paper was to review previous research regarding the academic stress experienced by students in Chinese culture, and to establish a conceptual model for future research. This research literature review has the implications for future research, education policy, and practice.

Research Implication: A Research Agenda about A Cultural Contextual Approach to Academic Stress and Coping in China

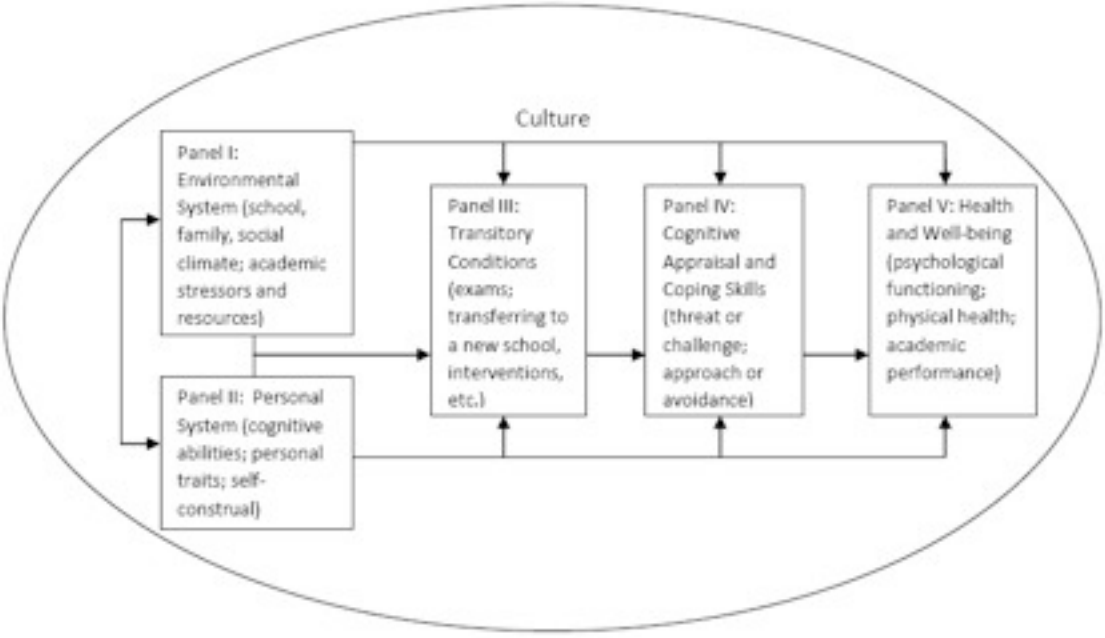
Based on the research reviewed above, there is a clear need for future research about academic stress in the Chinese context. Existing research in China has been limited by the lack of: (1) a theory-driven conceptualization of academic stress and coping, (2) instruments designed, specifically to assess academic stress and coping, and (3) experimental research investigating the effects of contextual factors on academic stress and coping. Thus, a number of questions regarding the nature of academic stress can be raised and should be addressed in future research. For example, how should academic stress and coping be conceptualized with a theory-driven approach in Chinese culture? How can academic stress and coping be assessed in a culturally sensitive manner? How do the cultural contextual factors affect Chinese students' academic stress and coping? A research agenda is needed to address these questions and take into consideration a variety of issues that include establishing a cultural contextual model of academic stress and coping, analyzing systematically the contextual factors related to academic stress, and developing new instruments (or adapting existing assessment tools) for measuring individual contextual factors or adapting existing assessment tools.

The following cultural contextual research agenda is generated based on a revision of Moos' transaction model (1984; 2002), emphasizing both cultural context and transactions between person and environment in relation to stress and coping (Lazarus & Folkman, 1984). There are five panels in Moos' model. This model (see Figure 1) describes the transactions between the ongoing environmental system (Panel I) and the personal (self) system (Panel II), and encompasses their joint influences on subsequent

transitory conditions (e.g., transferring to a new school) (Panel III), cognitive appraisal and coping skills (Panel IV), and the health and well-being (Panel V) of the individuals (Moos, 1984; 2002). Culture context would be better conceptualized as an ecological system that permeates the entire stress and coping processes, depicted in Figure 1.

To extend Moos' model to academic settings, the environmental system may consist of family (e.g., interpersonal relationship, parenting style, socioeconomic status), school (e.g., peer relationship), or social climate (e.g., school status label), as well as ongoing academic stressors (e.g., time tension) and resources. The personal (self) system is composed of students' personal characteristics, such as their cognitive abilities. Transitory conditions include new acute life events and changes that occur in a student's

Figure 1
Moos' Transactional Model



life (e.g., high-stakes tests, transferring to a new school). Students appraise these conditions for their degree of threat or challenge and whether the student is equipped with adequate personal and environmental resources to deal with the situation. Consequently, appraisal determines the type of coping strategies (e.g., problem-focused coping) that will be employed. The success of coping subsequently influences the student's health and well-being as well as academic performance. Cultural contextual factors influence all of the panels and serves as an overall context for the model.

Cultural contextual factors can be incorporated into this research design in a variety of ways. Based on the literature reviewed above, cultural contextual factors, that are particularly important for examining academic stress in China, appear to be related to family and social relationships and those related to the education system. Thus, variables such as parental expectations, social pressures, type of school (e.g., key, ordinary, or private), parenting style, family socioeconomic status as well as achievement related values held by school, family, and students all need to be investigated. To investigate how these variables affect academic stress, instruments are needed that have been designed specifically to measure these variables (i.e., parenting style). These might require adaptation of existing instruments or the development of new instruments.

One approach for obtaining data regarding contextual variables (i.e., parenting style, social economic status) involves having all the participants provide self-report information related to the contextual variables. Such an approach may produce more meaningful and well-founded results. A good example of this approach may be an interview checklist to examine different participants' (student, parent, or teacher) perceptions of these contextual variables. For instance, to collect the information

regarding parenting style, an interview checklist may include the inputs from both the parents and the children. Data obtained from multiple sources is likely to be more comprehensive and informative as compared to that obtained solely through self-reports from a single informant (Achenbach, 1998; Ollendick & Hersen, 1993).

Today, school and exams are an inevitable aspect of most children's lives across the cultures. Academic stress is a ubiquitous problem that students encounter every day. Cultural context provides a fundamental factor for the academic-related stress and coping paradigm by influencing each component of stress and coping: the ongoing environmental and personal systems, transient life conditions, cognitive appraisal and coping, and health and wellbeing. It is believed that additional efforts to study academic stress and coping, in light of the prevailing socio-economic, cultural, ecological conditions, might shed insight into how these constructs are understood and considered by the cultural context, and how they develop over time among students under academic stress. However, at present, researchers have given insufficient attention to cultural contextual variables such as cultural value systems and their impact on the development and maintenance of academic stress in children and adolescents. This is an important area for future researchers in China to explore the process of academic stress and coping.

Policy Implications

The practical implications of this paper for education policy are as follows. The first implication is to revise the college entrance exam system, because the NCEE, as the primary gatekeeper to college in China, generates high levels of academic stress (Feng, 1999). Ideally, the college entrance examination system should be a multi-dimensional appraisal system, not just based on the performance on one particular college entrance

exam. Under the new appraisal system, students might have multiple opportunities to take the college entrance exam (e.g., spring NCEE and winter NCEE). By doing this, students' academic stress to prepare for the NCEE may be reduced. As a matter of fact, since 2009, several provinces (i.e., Zhejiang, Tianjin) in China have implemented this format of "multiple college entrance exam" to reduce students' stress to prepare for the NCEE (Xinhuawang, 2011). Under the new system, colleges and universities may have more power to enroll new students based on multiple criteria so that the NCEE performance would not be the only criteria to enroll new students. Other criteria, such as high school students' academic performance on the selective subjects and special skills, may be considered. By doing this, the students who perform low on the NCEE may still have the opportunity to be admitted by the college or university for the students' other outstanding special skills and performances. This may reduce the students' academic stress and enhance academic performance. Meanwhile, with a revision of the college entrance system, a more reasonable curriculum may be established at all levels of education that might reduce students' academic workloads, and their academic stress, while enhancing their motivation to study. Based on "National Platform for Medium and Long-term Educational Reform and Development Plan" launched by the Central State Council in 2010, the college entrance exam system renovation requires some actions in near future, and some regulations (e.g., multiple NCEE every year) have been put into practice on a trial basis in several provinces. Beijing and Jiangsu province have published new curriculum reform, which points out the possibility to use multiple NCEE on the subject of English (Ren & Zhao, 2011). The renovation is in a starting phase, and no empirical

study has been done to explore how the renovation impacts the students' learning and reduces their academic stress.

Secondly, the education department in China may take actions to minimize difference between key schools and ordinary schools, and eventually revoke the school status label (key or ordinary school). The education department may consider adjusting and balancing the teacher resources of all schools (both ordinary and key schools), and minimize the difference on schools resources (e.g., teaching equipments) because the important criteria of a key or ordinary school include the teachers' teaching quality and the school resources. These actions may reduce the students' academic pressures to enter the key schools. Some researchers have investigated the academic stresses among students in the "ordinary" and "key" schools. They found out that students' academic stresses in "key" schools were much higher than those in "ordinary" schools (Chen & Yao, 1997; Wang, 2001).

Thirdly, more efforts should be made by schools to create an atmosphere to make learning attractive to students. To change current stressful, demanding, and joyless academic life, the education department should take real action to adjust curriculum contents, enrich the selective subjects, and reduce students' in-school studying time. For example, schools may consider create more selective subjects (e.g., music, art, sports, cooking) based on students' interests and suggestion. The school should enrich teachers' self-development and improve their teaching qualities as well as their abilities to help students deal with academic stress. For instance, the education department or school may periodically organize workshops to improve teachers' professional skills, such as how to teach students study skills and time management skills. The literature suggests that

students who take advantage of study skills and time management courses should be more effectively manage academic stresses (Chen, 2004).

Practice Implications

The findings from this paper have implications for teachers and parents who are interested in working to enhance the ability of students to manage academic stress. Researchers have suggested that coping is an important protective factor in stressful situations (Lazarus & Folman, 1984; Zeidner, 1995). Academic stress interventions that are designed to help students build a larger repertoire of coping strategies (e.g., time management skill) to address different stressors (e.g., excessive homework) should be provided to students on a regular basis. The interventions (e.g., time management training) that focus on reducing academic stress and developing coping skills would need to be culturally sensitive and targeted to meet the needs of the individual and the culture (e.g., school, family). The intervention should involve students, teachers, administrators, school counselors (if available), and parents within the culture. For example, the intervention for a student who has recently lost his/her father may need a different coping strategy to reduce his/her academic stress (e.g., reduce his/her homework) compared to other students who have not experienced this lost. The academic stress interventions (e.g., time management training or study skills training) could be a part of the school selective curriculum subject or could be included as an integral component of a treatment plan of a school counselor or other relevant school staff. Schools may offer academic stress management courses periodically. To attract students' participation, schools may provide seminars to introduce the academic stress management courses and teach students to be aware of the importance of academic stress management, and how

academic stress can affect students' mental health and school performance. Additionally, appropriate coping strategies may improve students' academic performance in stressful situations. Previous research reveals that students who use "approach" coping strategies outperform those who reporting less "approach" coping strategies (Liao, 2007).The research literature also suggests that teachers and parents who encourage students to use the coping strategies to deal with academic stress, such as making a study plan, managing time, and using a study guide, should facilitate students' motivation and performance (Chen, 2004).

References

Abouserie, R. (1994). Sources and levels of stress in relation to locus of control and self-esteem in university students. *Educational Psychology, 14,* 323–330.

Achenbach, T.M. (1998). Diagnosis, assessment, taxonomy, and case formulations. In T.H. Ollendick & M. Hersen (Eds.), *Handbook of child psychopathology* (3rd ed., pp. 63-87). New York: Plenum.

Aldwin, C. & E. Greenberger (1987). Cultural differences in the predictors of depression. *American Journal of Community Psychology*, *15*(6), 789-813.

Ang, R.P., & Huan, V.S. (2006a). Academic expectations stress inventory: Development, factor analysis, reliability, and validity. *Educational and Psychological Measurement, 66*, 522–539.

Bossy, S. (2000). Academic pressure and impact on Japanese students. *McGill Journal of Education, 35,* 71–84.

Burnett, P.C., & Fanshawe, J.P. (1997). Measuring school-related stressors in adolescents. *Journal of Youth and Adolescence, 26,* 415–428.

Chang, E.C. (1996a). Cultural differences in optimism, pessimism, and coping: Predictors of subsequent adjustment in Asian American and Caucasian American college students. *Journal of Counseling Psychology, 43*(1), 113-123.

Chang, E.C. (1996b). Evidence for the cultural specificity of pessimism in Asians vs Caucasians: A test of a general negativity hypothesis. *Personality & Individual Differences, 21*(5), 819-822.

Chang, E.C. (2001). A look at the coping strategies and styles of Asian Americans: Similar and different? In C.R. Snyder (Ed.), *Coping with stress: Effective people and processes* (pp. 222-239). London: Oxford University Press.

Cheung, F.M., Lee, S.Y., & Chan, Y.Y. (1983). Variations in problem conceptualizations and intended solutions among Hong Kong students. *Culture, Medicine, & Psychiatry, 7*(3)*,* 263-278.

Chang, W.C., Chua, W.L., & Toh, Y. (1997). The concept of psychological control in the Asian context. In K. Leung, U. Kim, S. Yamaguschi, & Y. Kashima (Eds.), *Progress in Asian social psychology* (pp.95-118). New York: John Wiley.

Chen, J., & Yao, Z. (1997). 240 12th graders' mental health status in a key high school. *Journal of Sichuan Mental Health*, *10*(2), 125-126

Chen, Q., Wu, Z, & Miao, F. (1998). College students' worries, coping strategies, and behaviors to seek social support. *Developmental Psychology and Education*, *98* (4), 26-31.

Chen, X. (2004). Research on middle school students' academic stresses, coping strategies, and coping psychological mechanisms. Doctoral dissertation. Chongqing: South-west Normal University.

Chen, S. (2002). The relationships between academic stressors, coping strategies, and emotions in a sample of secondary school students. *Journal of Chinese Mental Health, 16*(5), 337-339.

Cheng, D., Leong, F.T.L., & Geist, R. (1993). Cultural differences in psychological distress between Asian and Caucasian American college students. *Journal of Multicultural Counseling and Development, 21*, 182–190.

Chinese Youth Research Center Data. Retrieved on March 2, 2013, from http://news.xinhuanet.com/newscenter/2009-03/29/content_11094233.htm.

Cho, Y.Y. (1995). Language change as reranking of constraints. Paper presented at the *XII International Conference on Historical Linguistics, Manchester,* August 14, 1995.

Cross, S.E. (1995). Self-construes, coping, and stress in cross-cultural adaptation. *Journal of Cross-Cultural Psychology, 26*, 673-697.

Eshun, S., Chang, E.C., & Owusu, V. (1998). Cultural and gender differences in responses to depressive mood. *A study of college students in Ghana and the U.S.A. Personality & Individual Differences, 24*(4), 581-583.

Fanshawe, J.P., & Burnett, P.C. (1991). Assessing school-related stressors and coping mechanisms in adolescents. *British Journal of Educational Psychology, 61,* 92 – 98.

Feng, Y. (1995). From the imperial examination to the national college entrance examination: The dynamics of political centralism in China's educational enterprise. *Journal of Contemporary China, 8,* 28-56.

Feng, Y. (1999). National college entrance examinations: The dynamics of political centralism in China's elite education. *Journal of Education, 181* (1), 39-57

Folkman, S., and Lazarus, R.S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior, 21*, 219-239.

Gallagher M., & Millar R. (1996). A survey of adolescent worry in Northern Ireland. *Pastoral Care in Education, 14,* 26-32.

Ge, Y. (2008). A correlating study on relations among learning stress, test anxiety, self-efficacy, and learning strategy of junior students. Master dissertation. North-east Normal University.

Gow, L., Balla, J., Kember, D., & Hau, K.T. (1996). The learning approaches of Chinese people: A function of socialization processes and the context of learning? In M. H. Bond (Ed.), *The handbook of Chinese psychology* (pp. 109-123). Hong Kong: Oxford University Press.

Gu, Z. (1999). *Investigation of the special subject on conditions of primary and secondary school students' academic burden*. Nanning Shi: Guangxi Educational Publishing House.

Gu, M. (2004). *Education: Tradition and reform.* Beijing: Chinese People Education Press.

Ho, D.Y.F. (1998). Filial piety and filicide in Chinese family relationships: The legend of Shun and other stories. In U.P. Gielen & A.L. Comunian (Eds.), *The family and family therapy in international perspective* (pp. 134-149). Triest, Italy: Edizioni LINT.

Ho, D.Y.F. (1996). Filial piety and its psychological consequences. In M.H. Bond (Ed.), *The handbook of Chinese psychology* (pp.155–165). Hong Kong: Oxford University Press.

Hofstede, G. (1991). *Cultures and organizations: Software of the mind.* London, UK: McGraw-Hill.

Huang, S.L., & Waxman, H.C. (1995b).Motivation and learning environmental differences between Asian American and white middle school students in mathematics. *Journal of Research and Development in Education, 28,* 208-219.

Huang, X., Yu, H., Zhen, Y., Yang, J., & Wang, W. (2000). A preliminary research on the coping style of middle school students. *The Science of Psychology, 23*(1), 1-6.

Jia, Z. (2011). Series of reports on parents' accompanying study with children. *Xihai City Newspaper*. Retrieved on March 16th, 2011.

Jiang, S. (2007). Research on parents' accompanying study. *Journal of Nanjing Agriculture University*. Retrieved on March 2nd, 2013.

Kohn, J.P., & Frazer, G.H. (1986). An academic stress scale: Identification and rated importance of academic stressors. *Psychological Reports, 59,* 415–426.

Kyriacou, C., & Butcher, B. (1993). Stress in year 11 school children. *Pastoral Care in Education, 11*(3), 19-21.

Lam, A.G., & Zane, N.W.S. (2004). Ethnic differences in coping with interpersonal stressors. *Journal of Cross-Cultural Psychology, 35,* 446-459.

Lay, C., Fairlie, P., Jackson, S., Ricci, T., Eisenberg, J., Sato, T., Teeäär, A., & Melamud, A. (1998). Domain-specific allocentrism-idiocentrism: A measure of family connectedness. *Journal of Cross-Cultural Psychology, 29,* 434-460.

Lazarus, R.S., & Folkman, S. (1994). *Stress, appraising, and coping.* New York: Springer.

Lee, M., & Larson, R. (2000). The Korean ''examination hell'': Long hours of studying, distress and depression. *Journal of Youth and Adolescence, 29,* 249–271.

Lee, E. (1997). Chinese American families. In E. Lee (Eds.), *Working with Asian Americans: A guide for clinicians* (pp. 46-78). New York: Guilford Press.

Leung, G., Yeung, K.K., & Wong, D. (2010). Academic stressors and anxiety in children: The role of paternal support. *Journal Of Child & Family Studies, 19*(1), 90-100.

Lewin, K. & Xu, H. (1989). Rethinking revolution: reflections on China's 1985 educational reforms. *Comparative Education, 25,* 7-17.

Li, Y. & Zhang, J. (2004). The relationship between personality traits, subjective stress, and coping styles in adolescence. *Journal of Psychology, 36*(1), 71-77.

Li, C. (2004). Investigating the phenomena of parents' accompanying study with secondary school students. *Pedagogy and Management, 5*(2), 10-11.

Li, W. (2010). Exploring the social cultural background of Chinese students' academic stress. *Contemporary Educational Science, 4,* 15-17.

Liao (2007). Research on the relationship between pressure in college entrance examination, coping strategies and examination results. Master dissertation, South-west University.

Liu, Y., & Dunne, M. (2009) Educational reform in China: tensions in national policy and local practice. *Comparative Education, 45*(4), 461-476

Liu, X., Liu, L., Li, C., Ma, D., Zhao, G., Yang, J, & Sun, L. (1998). Research on adolescents' stressful life events and coping style. *Journal of Chinese Mental Health, 12*(1), 46-48.

Liu, B. (2009). Analysis and reflection of parents' accompanying study with children. *Pedagogy and Management*. Retrieved on March 2nd, 2013.

Lou, W., & Chi, I. (2000). The stressors and psychological well-being of senior secondary school students. *Psychological Science China, 23,* 156–159.

Marsella, A. J., & Dash-Scheuer, A. (1988). Coping, culture, and healthy human development: A research and conceptual overview. In P.R. Dasen, J.W. Berry, & N. Sartorius (Eds.), *Health and cross-cultural psychology: Toward applications* (pp.162-178). Newbury Park, CA: Sage.

McCarty, C.A., Weisz, J.R., Wanitromanee, K., Eastman, K.L., Suwanlert, S., Chaiyasit, W., et al. (1999). Culture, coping, and context: Primary and secondary control among Thai and American youth. *Journal of Child Psychology & Psychiatry & Allied Disciplines, 40*(5), 809-818.

Moos, R.H. (1984). Context and coping: Toward a unifying conceptual framework. *American Journal of Community Psychology, 12*(1), 5-25.

Moos, R.H. (2002). 2001 INVITED ADDRESS: The mystery of human context and coping: An unraveling of clues. *American Journal of Community Psychology, 30*(1), 67-88.

Morling, B., & Fiske, S.T. (1999). Defining and measuring harmony control. *Journal of Research in Personality, 33,* 379-414.

Mortenson, S.T. (2001). Cultural variations in emotion and effective emotional support processes: Documenting differences in the experience, expression, and management of emotional distress. Dissertation Abstracts International Section A: Humanities & Social Sciences, 62.

Nonis, A.A., Hudson, G.I., Logan, L.B., & Ford, C.W. (1998). Influence of perceived control over time on college students' stress and stress-related outcomes. *Research in Higher Education, 39*(5), 587-605.

Ollendick, T.H., & Hersen, M. (Eds.). (1993). *Handbook of child and adolescent assessment*. Boston: Allyn & Bacon.

Oyserman, D., Coon, H.M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin, 128,* 3-72.

Feng, Y., & Zhou, A. (2002). Relational Research of Middle School Students' Life Events and Coping Styles and Anxiety. *Psychological Development and Education, 1,* 71-74.

Thoits, P.A. (1995). Stress, coping, and social support processes: Where are we? What next? *Journal of Health and Social Behavior, 35,* 53–79.

Trubisky, P., Ting-Toomey, S., & Lin, S. (1990). The influence of individualism-collectivism and self-monitoring on conflict styles. *International Journal of Intercultural Relations, 15*(1), 65-84.

TSENG, W.S. & WU, Y.H. (1985) *Chinese culture and mental health*. New York: Academic Press.

Verma, S., Sharma, D., & Larson, R. (2002). School stress in India: Effects on time and daily emotions. *International Journal of Behavioral Development, 26,* 500-508.

Wang, Y., & Ollendick, T.H. (2001). A cross-cultural and developmental analysis of self-esteem in Chinese and Western children. *Clinical Child & Family Psychology Review, 4,* 253–271.

Wang, Y. (2001).The research on 12th graders' personality and academic stress to prepare NCEE. *Psychological Science, 24*(1), 104-105.

Wang, Z. (2010). The research on middle school students' time management disposition, academic performance, and academic stress. Master dissertation, Hebei Normal University.

Wang, D. (2012). Parents' accompanying study: The trend to rent apartment for students before NCEE, *East Asia Economy and Trade News.* Retrieved on March 2nd, 2013.

Weisz, J.R., Rothbaum, F.M., & Blackburn, T.C. (1984). Standing out and standing in: The psychology of control in America and Japan. *American Psychologist, 39*(9), 955-969.

Wong, P.T.P., & Wong, L.C.J. (Eds.). (2006). *Handbook of multicultural perspectives on stress and coping.* New York, NY: Springer.

Wong, P.T.P., Wong, L.C.J., & Scott, C. (2006). The positive psychology of transformation: Beyond stress and coping. In Wong, P.T.P., & Wong, L.C.J. (Eds.), *Handbook of Multicultural perspectives on stress and coping.* New York, NY: Springer.

Ren, X.X. & Zhao, Q. (2011). *The National College Entrance Exam in China will be Adjusted*. Retrieved from Xinhuawang on March 2nd, 2013.

Yang, K.S. (1981). The formation and change of Chinese personality: A cultural ecological perspective. *Acta Psychologica Taiwanica, 23,* 39-56.

Yang, K.S. (1986). Chinese personality and its change. In M. H. Bond (Eds.), *The psychology of the Chinese people*. Oxford University Press, Warwick House,

Hong Kong.

Yang, X. (2005). Analysis on causes and strategies of students workloads, *Journal of Dai Zong, 2,* 73-74.

Ye, X. (2003). The relationships between middle school students' academic stress and performance. *Journal of Chinese Education, 8,* 43-45.

Yeh, C.J., & Huang, K. (1996). The collectivistic nature of ethnic identity development among Asian-American college students. *Adolescence, 31,* 645–661.

Yeh, C.J., & Wang, Y.W. (2000). Asian American coping attitudes, sources, and practices: Implications for indigenous counseling strategies. *Journal of College Student Development, 41,* 94-103

Yeh, C.J., Carter, R.T., & Pieterse, A.L. (2004). Cultural values and racial identity attitudes among Asian American students: An exploratory investigation. *Counseling and Values, 48,* 82-95.

Ying, L. (2011). Analysis of Chinese education purpose and current situation. Retrieved from Language Education Dissertation Website on March 2nd, 2013.

Zeidner, M. (1995). *Coping with examination stress: resources, strategies, outcomes. anxiety, stress, and coping, 8,* 279-298.

Zhang, X. & Du, X. (2005). Analysis and strategy on middle school students' academic stressors. *Journal of Nemengu Normal University, 18*(6), 58-60.

Zhang, H. (1995). Research on test anxiety and temperament of students in teachers colleges and university. *Teacher Education Research, 4,* 109-110.

Zhen, Q., & Chen, S. (1999). Development of stress scale for secondary school students. *Developmental Psychology and Education, 4,* 45-49.

Zhen, L., Wan, L., & Li, Z. (2001). Linear regression analysis of the effects of academic stress on students' mental and physical health. *Chinese School Health, 3,* 224-225.

CHAPTER 2

ACADEMIC STRESS, TEST ANXIETY, AND PERFORMANCE IN A CHINESE HIGH SCHOOL SAMPLE: THE MODERATING EFFECTS OF COPING STRATEGIES AND PERCEIVED SOCIAL SUPPORT

Introduction

Test performance is important in determining a student's academic placement (i.e., retention or promotion), and this issue has been the focus of much research in both Western countries and China. For instance, as the most important test for Chinese high school students, the China National College Entrance Exam (NCEE) plays a vital role in a student's future opportunities and career pathways, because performance on the NCEE serves as the primary gatekeeper to college (Feng, 1999). High-stakes tests, such as NCEE, may generate high levels of stress and anxiety related to the examination process, and this may affect students' performance on such tests. The current study is designed to examine this problem in a sample of Chinese high school students.

Academic stress is conceptualized as a state of distress induced by a student's appraisal of excessive academic demands (e.g., overloaded homework, examinations; Lee & Larson, 2000; Lou & Chi, 2000), often resulting in negative effects on student's mental and physical health (e.g., Clark & Rieker, 1986; Felsten & Wilcox, 1992), as well as their school performance (e.g., Struthers, Perry, & Menec, 2000). While previous investigations in Western countries have consistently found significant negative relationships between students' academic stress and school performance (Blumberg & Flaherty, 1985; Clark & Rieker, 1986; Felsten & Wilcox, 1992; Hockey, 1979; Linn & Zeppa, 1984; Misra & McKean, 2000; Struthers et al., 2000), few studies have examined

this association among students in China (e.g., Liao, 2007). This is a significant gap in the research literature in the context of Chinese culture due to the highly competitive climate for Chinese students who take the national college entrance exam (NCEE). This competitive climate is exacerbated by the expectations and pressures introduced by Chinese parents and teachers in preparing students for the NCEE (Feng, 1999).

Test anxiety is widely accepted as a situation-specific trait that predisposes the individual to respond with elevated anxiety in response to a test (Hodapp, Glanzman, & Laux, 1995). Two major dimensions of test anxiety are worry and emotionality (Liebert & Morris, 1967). Over the past decades hundreds of studies have investigated the complex pattern of relationships between test anxiety and performance (Zeidner, 2007). Although one study reported that there was no association between test anxiety and test performance (Wills & Leathem, 2004) and some suggested that these variables were related, in a curvilinear fashion (Goldsmith & Albrecht, 1993; Orpen, 1996; Schwarzer & Jerusalem, 1992), most researchers in Western countries have found that test anxiety and academic performance are inversely related (see reviews and meta-analyses in Hembree, 1988; Masson, Hoyois, Pcadot, Nahama, Petit, & Ansseau, 2004; Seipp, 1991; Schwarzer, 1990; Zeinder, 2007, 2008). Recently, some researchers in China have also explored the association between test anxiety and performance (Chen, 2006; Jiang & Zhang, 2006; Li, 2003; Li, Liu, Lan, & Ma, 2009) and this has included some investigations about how test anxiety was related specifically to performance on the NCEE (Ye, Ji, Tao, Wang, & Wang, 1999). Generally, studies in China have found that high school students' academic performance was negatively related to test anxiety (Li, 2003; Li, Liu, Lan, & Ma, 2009; Liu & Guo, 2003).

Given the adverse consequences of academic stress and test anxiety, it is practically and theoretically important to delineate factors that may help students when they experience the stress involved in taking tests. Perceived social support and coping strategies are two important intervening factors that may shield a person from stress and anxiety (Sorensen, 1993). The perceived availability of social support (i.e., the perception that social network members are caring and accessible), the actual use of coping strategies that seek to obtain social support, and the manner in which one seeks social support may all influence a person's mental/physical health (Albrecht & Adelman, 1987; Cohen, 2004; Picot, 1995; Zimet et al., 1988) and performance (e.g., Cutron, Cole, Colangelo, Assouline, & Russell, 1994) under stressful circumstances. Perceived social support has been reported as a protective factor for students from Western countries who experience stress and anxiety (Albrecht & Adelman, 1987; Cohen, 2004; Picot, 1995; Zimet et al., 1988). Perceived social support may have direct and indirect (moderating) effects on Chinese students' mental/physical health and academic performance because traditionally supportive relationships have been highly valued in Chinese culture (Leung, Yeung, & Wong, 2010). In this context, it has been suggested that the availability of a good social support network is particularly meaningful for Chinese high school students, who are under great pressure to prepare for the NCEE and need extra and continuous assistance from others in both academic and emotional areas (Feng, 1999). In addition to the resources that can be provided through social support, an individual's coping strategies (e.g., asking for help) may be another important protective factor, that can have a direct effect (main effect) in determining one's mental/physical health and performance in stressful evaluative situations (Compas, Champion, & Reeslund, 2005; Dai, Yan, &

Wang, 2004). Alternatively, coping strategies may have an indirect effect (serving as a moderator) by influencing the relationships between stress, anxiety, and performance in testing situations (Zeidner, 1995).

Test taking is a complex process that can produce elevated stress and anxiety, with subsequent influences on test performance. This study is designed to shed light on the relationships among academic stress, test anxiety, coping strategies, perceived social support, and test performance in a Chinese high school sample. Specifically, this study will test the indirect (moderating) effects of coping strategies and perceived social support on the relationships between academic stress, test anxiety, and test performance. In the next section, the relevant literature is reviewed briefly to explore relationships among these variables and provide support for key hypotheses of the study.

Theoretical Background and Hypotheses

Integrative Transactional Model

Several models or theories have been proposed to explain how stress and test anxiety work together to influence behavior (e.g., drive model, Spence, 1958; or deficit model, Culler & Hollahan, 1980). This study used Zeidner's (1997) integrative transactional model to explore the complex relationships among these variables. This theoretical framework conceptualizes stress and test anxiety as part of a dynamic process involving the reciprocal interaction of a number of distinct elements in the stressful encounter between a person and an evaluative situation (Zeidner, 1997). Not only do individuals react to situations, they also affect these situations through continuous interactions. In this model, stress and test anxiety are conceptualized as the result of a particular person-environment transaction, where the stressful event is appraised by a

person as threatening and exceeding his/her coping resources (Lazarus 1999). Coping strategies and perceived social support are two important intervening variables in the transaction that may shield a person from stress, anxiety, and their negative effects (Sorensen, 1993).

Univariate Relationships between Academic Stress, Test Anxiety, and Performance

Stress associated with academic activities has been linked to various negative outcomes, such as anxiety (e.g., Aldwin & Greenberger, 1987) and poor academic performance (e.g., Clark & Rieker, 1986; Linn & Zeppa, 1984). Researchers in both Western countries and China have investigated the relationship between academic stress and test anxiety. For example, Aldwin and Greenberger (1987) found that academic stress was positively related to anxiety and depression in college students. Studies conducted in China revealed that academic stress was a risk factor that heightened students' anxiety levels (e.g., Leung,Yeung, & Wong, 2010; Wang & Ding, 2003). For example, Wang & Ding (2003) found that academic stress of college students was positively correlated with anxiety in a testing situation. A similar finding was found in both Ge's (2008) study and Zhou and his colleagues' study (2005). They reported that secondary school students' academic stress was significantly and positively related to their anxiety level when faced with stressful exams.

A number of studies in Western literature have identified a relationship between academic stress and academic performance (e.g., Clark & Rieker, 1986; Linn & Zeppa, 1984, Struthers et al., 2000). For example, both Felsten and Wilcox (1992) and Blumberg and Flaherty (1985) found a significant negative correlation between the stress levels of college students and their academic performance. However, very few studies have

examined this association between academic stress and test performance in China. The majority of studies on academic stress in Chinese students have investigated the relationships between academic stress, coping strategies (Chen, 2004), and mental health (Zhen, 2001). Only one study was found that investigated students' stress and academic performance in a Chinese sample (Liao, 2007). This investigation revealed that high school students' academic stress when preparing for the NCEE was related negatively to their performance on that test.

The complex relationship between test anxiety and performance has been investigated by a number of researchers in both Western countries and China (Chen, 2006; Hembree, 1988; Jiang & Zhang, 2006; Li, 2003; Li, Liu, Lan, & Ma, 2009; Liao, 2007; Liu & Guo, 2003; Masson et al, 2004;Seipp, 1991; Schwarzer, 1990; Ye, Ji, Tao, Wang, & Wang, 1999; Zeinder, 2007, 2008). The majority of findings from researchers in Western countries and China have indicated that test anxiety and academic performance are inversely related (Chen, 2006; Hembree, 1988; Jiang & Zhang, 2006; Li, 2003; Li, Liu, Lan, & Ma, 2009; Liao, 2007; Liu & Guo, 2003; Masson et al, 2004;Seipp, 1991; Schwarzer, 1990; Ye, Ji, Tao, Wang, & Wang, 1999; Zeinder, 2007, 2008). In particular, at least one Chinese researcher found that test anxiety was negatively related to performance on the NCEE (Ye, Ji, Tao, Wang, & Wang, 1999).

Although many researchers have explored the relationship between test anxiety and test performance in China, limited efforts have examined the relationships between academic stress and test performance as well as the relations between academic stress and test anxiety. Thus, one goal of this study was to explore the univariate relationships

between academic stress, test anxiety, and test performance in a group of Chinese high school students.

Hypothesis 1: Academic stress of Chinese high school students is positively related to test anxiety.

Hypothesis 2: Academic stress of Chinese high school students is negatively related to performance on the Pre-NCEE test, which has the same format and similar contents as NCEE.

Hypothesis 3: Test anxiety of Chinese high school students is negatively related to performance on the Pre-NCEE test.

Moderating Effects of Coping Strategies on the Relationships between Academic Stress, Test Anxiety, and Performance

Coping has been conceptualized as an important protective factor in stressful situations (Lazarus & Folman, 1984; Zeidner, 1995). According to Folkman and Lazarus (1980), coping is defined as the cognitive and behavioral efforts to master, reduce or tolerate the internal or external demands that are created by a stressful transaction. Many models have been developed to measure coping strategies. For example, the problem-focused and emotion-focused model (Folkman and Lazarus, 1980) is a major model. Problem-focused coping strategies refer to managing or solving the problem by removing or circumventing the stressor; whereas emotion-focused coping strategies refer to regulating, reducing, or eliminating the emotional arousal associated with a stressful situation (Folkman & Lazarus, 1980). Endler and Parker (1990) proposed that problem-focused coping is task-oriented and emotion-focused coping is person-oriented. It is believed that problem-focused coping strategies are active, overt, constructive, and

adaptive, whereas emotion-focused coping are passive and covert (Wong & Wong, 2006). A widely accepted coping instrument that used "problem-focused" and "emotion-focused" dimensions is the Ways of Coping Questionnaire (WCQ; Folkman & Lazrus, 1980).

In a stressful testing situation, coping can be viewed as a complex phenomenon and may have an indirect moderating role by influencing the relationship between academic stress and test anxiety. There have been few investigations of the moderating role of coping strategies on this relationship. Zeidner's (1994) investigation is the only study found examining this moderating effect of coping strategies on the relationship between academic stress and test anxiety. In his study, Zeidner (1994) examined the moderating effects of coping strategies on the relationships between academic stress, personal variables (e.g., depressive tendencies), and anxiety status using both neutral and evaluative testing conditions. A Hebrew adaptation of the Coping in Stressful Situations Inventory (CISS; Endler & Parker, 1990) was used in this study to assess 198 college students' coping strategies. The data suggested that "task-oriented" coping strategies moderated the effects of academic stress on anxiety in a stressful evaluative encounter. In this case, the relationship between academic stress and anxiety was attenuated for those who employed more "task-oriented" coping relative to those employing less "task-oriented" coping.

In the current study, the Simplified Coping Styles Questionnaire (SCSQ; Xie, 1998) is used to determine Chinese high school students' perception of their coping strategies. This scale was designed based on Folkman and Lazarus' (1980) problem-focused and emotion-focused model and the Ways of Coping Questionnaire (WCQ;

Folkman & Lazrus, 1980). Two subscales of the SCSQ are termed as active coping and passive coping. Active coping is the term used for problem-focused strategies in this instrument and includes the process of taking active steps to try to remove or circumvent the stressor. Examples of active coping strategies from the SCSQ are: fighting for what one wanted, trying to solve the problems in different ways, seeking support from parent or friends, etc. The active coping items measured by this scale are very similar to the "problem-focused" coping items in the Ways of Coping Questionnaire (WCQ; Folkman & Lazarus, 1980). Passive coping in the SCSQ is the term used for emotion-focused coping and reflects how people regulate, reduce, or eliminate the emotional arousal associated with the stressful situation (Folkman & Lazarus, 1980). Examples of passive coping strategies from SCSQ are: getting rid of distress by smoking, taking drugs, or eating, trying to forget the whole thing, imagining a mirage, self-comforting, etc. These passive coping items are similar to the "emotion-focused" coping items in the Ways of Coping Questionnaire (WCQ; Folkman & Lazarus, 1980).

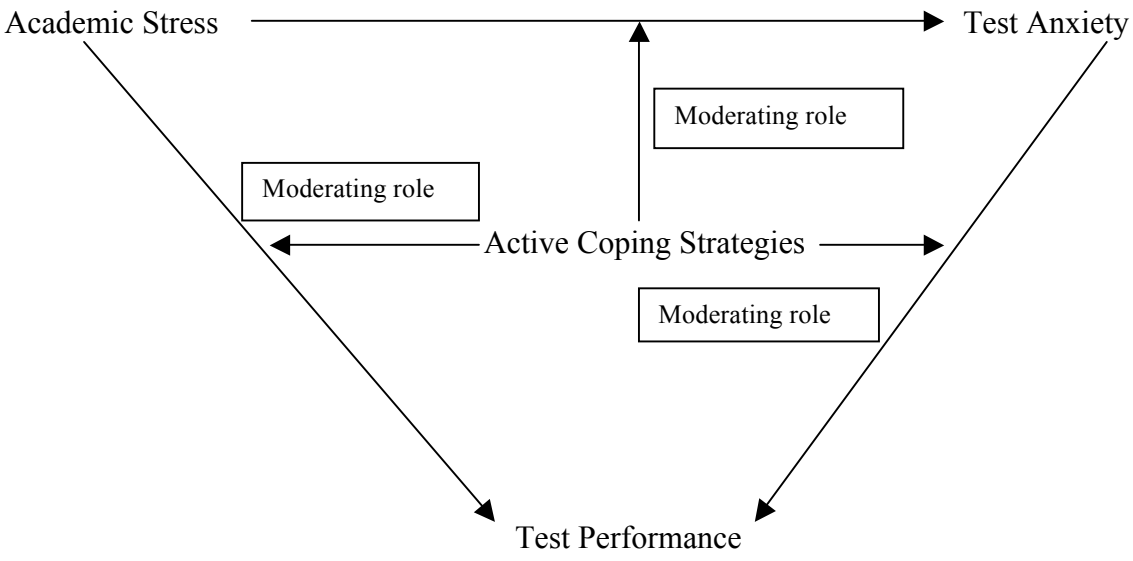
Because Zeidner's (1994) investigation is the only study found in the Western countries examining the moderating effects of "task-oriented" (active) coping on the relationships between academic stress, anxiety, and performance, further research is needed. There has been no similar study conducted in China examining the moderating effects of active coping strategies even though it is believed that active coping strategies play an important role in the relationships between stress and test anxiety, between stress and test performance, and also between test anxiety and performance. Therefore, the present study examines the effects of active coping by determining whether active coping has a moderating effect on the relationships among academic stress, test anxiety, and

performance in a group of Chinese high school students. The conceptual framework for these hypotheses was as follows (Figure 2).

Hypothesis 4: The active coping strategies (problem-focused) used by Chinese high school students will moderate the relationship between academic stress and test anxiety. Specifically, the positive relationship between academic stress and test anxiety will be attenuated for Chinese high school students who report using a large number of active coping strategies. In contrast, it is predicted that those who report using relatively few active coping strategies will have a higher positive relationship between academic stress and test anxiety.

Hypothesis 5: The active coping strategies (problem-focused) used by Chinese high school students will moderate the relationship between academic stress and test performance. Specifically, the negative relationship between academic stress and test

Figure 2
Conceptual Framework of Relationship between Academic Stress, Test Anxiety, Test Performance, and Active Coping Strategies



performance will be attenuated for Chinese high school students who report using a large number of active coping strategies. In contrast, it is predicted that those who report using relatively few active coping strategies will have a higher negative relationship between academic stress and test performance.

Hypothesis 6: The active coping strategies (problem-focused) used by Chinese high school students will moderate the relationship between test anxiety and test performance. Specifically, the negative relationship between test anxiety and test performance will be attenuated for Chinese high school students who report using a large number of active coping strategies. In contrast, it is predicted that those who report using relatively few active coping strategies will have a higher negative relationship between test anxiety and test performance.

Moderating Effects of Perceived Social Support on the Relationships between Academic Stress, Test Anxiety, and Performance

Arnold (1990) defined social support as the perceived availability of help or assistance from other persons during times of felt need. Perceived social support is a resource that is provided by others through social interactions and this can help people when confronted with various stressors (Pearlin & Schooler, 1978). Lazarus and Folkman (1984) mentioned that if people believed they would receive social support when it is needed, they would have better mental and physical health, because people may spend less time worrying about life's problems, thereby reducing the experience of anxiety and depression (Wills & Cleary, 1996).

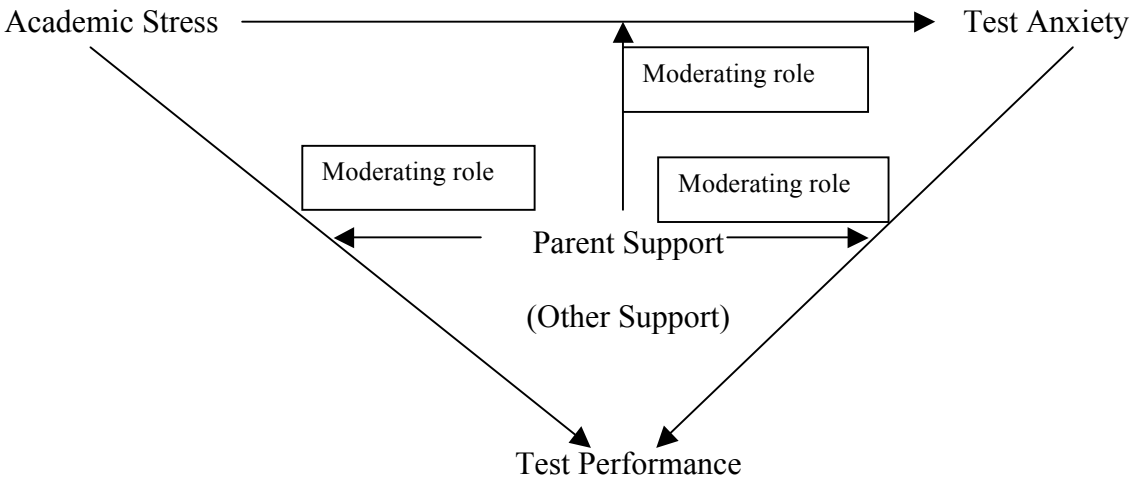
Although the relationships between perceived social support and mental/ physical health have been well established in the research literature of Western countries and

China (Chen, Siu, Lu, Cooper, & Phillips, 2009; Cohen & Wills, 1985; Glaser, Tatum, Nebeker, Sorenson, & Aiello, 1999; Hauck, Snyder, & Cox-Fuenzalida, 2008), very few attempts have been made to explore the buffering role of perceived social support on the relationships between academic stress, test anxiety, and test performance. Goldsmith and Albrecht (1993) conducted a study with a sample of 143 college students to examine the moderating effect of perceived social support on the relationship between test anxiety and test performance. The student support network in this study consisted of outside class support (i.e., parents and friends) and inside class support (i.e., peers). Results indicated that for students with high test anxiety, the more outside support from parents and friends they perceived, the higher exam grades they had; while the more inside class support from peers they perceived, the lower exam grades they had. One explanation was that in-class peers may offer advice to "stop worrying about the exam, you only need a C in the class", which could be considered as a supportive suggestion, and actually reduce the student's motivation to do well on the exam. Partially similar to Goldsmith and Albrecht's research, Orpen (1996) sampled 121 first-year college students to examine the extent to which support from family, friends, and in class peers moderated the relationship between test anxiety and examination performance. Results showed that outside support from parents and friends moderated the relationship between test anxiety and examination performance: for students with higher test anxiety, the more they reported outside support from parents and friends, the higher their exam grades were. However, support from in class peers had no moderating effect on the relationship between test anxiety and performance.

There has been no similar study in China examining the buffering effects of perceived social support on the relationships between academic stress, test anxiety, and test performance even though it is believed that parental support and other support (i.e., teachers and friends, as will be explained in the method and result sections) both play an important role in students' academic success in Chinese society. Therefore, the present study examines the effects of social support by determining whether social support has moderating effects on the relationship between academic stress, test anxiety, and test performance in a Chinese high school sample. The conceptual framework for these hypotheses was as follows (Fig. 3).

Hypothesis 7: Chinese high school students' perceived parent support will moderate the relationship between test anxiety and test performance. Specifically, the negative relationship between test anxiety and test performance will be attenuated for Chinese high school students who report high levels of perceived parent support. In

Figure 3
Conceptual framework of relationship between academic stress, test anxiety, test performance, and perceived social support (parent support and other support)



contrast, it is predicted that those who report low levels of parent support will have a higher negative relationship between test anxiety and test performance.

Hypothesis 8: Chinese high school students' perceived other support will moderate the relationship between test anxiety and test performance. Specifically, the negative relationship between test anxiety and test performance will be attenuated for Chinese high school students who report high levels of perceived other support. In contrast, it is predicted that those who report low levels of other support will have a higher negative relationship between test anxiety and test performance.

Hypothesis 9: Chinese high school students' perceived parent support will moderate the relationship between academic stress and test anxiety. Specifically, the positive relationship between academic stress and test anxiety will be attenuated for Chinese high school students who report high levels of perceived parent support. In contrast, it is predicted that those who report low levels of parent support will have a higher positive relationship between academic stress and test anxiety.

Hypothesis 10: Chinese high school students' perceived other support will moderate the relationship between academic stress and test anxiety. Specifically, the positive relationship between academic stress and test anxiety will be attenuated for Chinese high school students who report high levels of perceived other support. In contrast, it is predicted that those who report low levels of other support will have a higher positive relationship between academic stress and test anxiety.

Hypothesis 11: Chinese high school students' perceived parent support will moderate the relationship between academic stress and test performance. Specifically, the negative relationship between academic stress and test performance will be attenuated for

Chinese high school students who report high levels of perceived parent support. In contrast, it is predicted that those who report low levels of parent support will have a higher negative relationship between academic stress and test performance.

Hypothesis 12: Chinese high school students' perceived other support will moderate the relationship between academic stress and test performance. Specifically, the negative relationship between academic stress and test performance will be attenuated for Chinese high school students who report high levels of perceived other support. In contrast, it is predicted that those who report low levels of other support will have a higher negative relationship between academic stress and test performance.

Methods

Setting

The present study was conducted at a high school in Yueyang, Hunan Province. Yueyang is a small city in southern China. It is situated on undulating hills and is surrounded by farmland. There are three major types of schools in China: ordinary schools, key schools, and private schools, with the former two being public schools. Compared with ordinary schools, key schools are equipped with better teachers and more funding (from regional government), and generally have a better learning environment, which makes them attractive for the academically advanced and highly motivated students. Compared with the classes in private schools, the classes in most ordinary and key schools are over-sized due to government budget shortages. The participating high school is one of the nine key high schools in Hunan Province. There are 2,100 students and three grade levels (grades 10, 11, and 12) in this school, with 60 to 70 students per class. The NCEE passing rates of this high school have been reported in the range of 70%

to 80% during the past 5 years, whereas the average passing rates for the ordinary high schools have been recorded in the range of 20% to 30%. Due to the varying conditions and resources of key high schools and ordinary high schools, the findings obtained in this study may only be applied to the 12th graders in key high schools who are preparing to take the university examination (NCEE). The 12th grade students take several Pre-NCEE examinations to evaluate their abilities to take NCEE. The Pre-NCEE is a standardized comprehensive exam, which covers all subjects at all the levels (from elementary to secondary schools). Pre-NCEE has the same format and similar contents as the NCEE. The scores from the pre-NCEE determine the students' ranking in the grade, which may be used as the criterion to choose the 1% outstanding students who are waived from taking the NCEE to enter certain colleges.

Participants

This study used a convenience sample of 448 12th grade high school students (51% males and 49% females). Seniors take the Pre-NCEE tests to prepare NCEE. Students' background information was obtained from a demographic survey indicating that participants' ages ranged from 16 to18, and the sample included 99% Han majority and 1% ethnic minority. In addition, ten percent of the students reported that they were from high income families, 28% of the students from middle income families and 5% were from low income families, while fifty-seven percent of students did not report their family economic status.

Instruments

*Test Anxiety Inventory (TAI; Spielberger et al., 1980) - Chinese Version***:** The TAI is one of the most widely used instruments for measuring test anxiety in high school and

college students. The TAI consists of 20 items in which respondents are asked to report how often they experience anxiety symptoms before, during, and after taking tests. Each item is rated on a 4 point Likert scale (1=almost never, 2=sometimes, 3=often, 4=almost always), where respondents indicate how often they have experienced the reaction to tests described in the item, yielding a total test anxiety score ranging from a minimum of 20 to a maximum of 80 points. The TAI yields two subscale scores that measure worry and emotionality. The Chinese Version TAI (TAI-C) was translated by Ye (Ye, 1989). The reading level of the TAI-C is appropriate for the 12th grade high school students in this study. Psychometric data on the TAI-C suggests adequate test-retest reliability and internal reliability. Test-retest reliabilities for the TAI-C total scores, and the Worry and Emotionality subscales have ranged from .72 to .88. The internal consistency as measured by Cronbach's alpha for the TAI-C total, Worry subscale, and Emotionality subscale are .90, .84, and .80, respectively. The TAI-C also has demonstrated adequate validity. The relationship between the TAI-C and its subscales with other anxiety measures, such as Sarason's Test Anxiety Scale (TAS; Sarason, 1978), provide evidence of convergent validity. The correlation between the TAI-C scores and the TAS was significantly high (.60) which suggested that the two scales measure essentially the similar construct.

Academic Stress Scale (ASS; Kohn & Frazer, 1986)-Chinese Version: The ASS *is* a 35 item scale designed to measure the students' perceived academic stressors. Respondents report their level of stress under 35 different stressful situations (e. g., examination, excessive homework) using a 5 point Likert response format (1=not at all stressful, 2=rarely stressful, 3=sometimes stressful, 4=fairly stressful, 5=extremely

stressful). Scores are obtained by summing the reported scores for each item. A higher score is indicative of greater stress. The ASS was translated into Chinese for the purpose of this study by the researchers to assess the students' perceived academic stress. Two items were deleted from the original scale ("irrelevant classes toward major" and "evaluating classmates' work"), because they are inappropriate in Chinese high school context. High school students in China do not have a major and their school work is evaluated by the teacher, not their classmates. The items were then translated literally back into English and the authors resolved discrepancies in intended meanings and wording of the items. The reading level of the ASS-C is appropriate for 12th grade high school students in this study. The ASS has satisfactory internal consistency as measured by Cronbach's alpha and split-half reliability (.92 and .86, respectively; Kohn & Frazer, 1986).

Simplified Coping Styles Questionnaire (SCSQ; Xie, 1998): SCSQ was developed in China by Xie (Xie, 1998), based on the Problem-focused and Emotion-focused model (Lazarus & Folkman, 1984). The SCSQ (Xie, 1998) is considered appropriate for Chinese culture (Zhao, Xu, & Xie, 2006). SCSQ consists of 20 items referring to different ways of coping, with a total score range from 0 to 60. Two subscales are active coping (problem-focused) and passive coping (emotion-focused) with items 1to12 for active coping strategies (problem-focused) and items 13 to 20 for passive coping strategies (emotion-focused). Each item uses a 4-point Likert- type scale (0 = not use, 1 = use occasionally, 2 = use sometimes, 3 = use frequently) where respondents indicate how often they have used the coping strategy described in the item. The SCSQ has good validity and reliability. Correlations of two-week test-retest reliability were 0.89 for the

overall SCSQ scale. Cronbach's alpha for the entire questionnaire was 0.90, and Crobach's alpha for the active coping subscale and passive coping subscale were 0.89 and 0.78, respectively.

*Multi-dimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988)-Revised Chinese Version***:** The MSPSS is a 12-item self-report questionnaire designed to measure the perception of individuals' social support. This measure includes three subscales (of four items each) addressing three different sources of support: family, friends, and significant others. The response format is based on a 7-point Likert scale ranging from 1 (very strongly disagree) to 7 (very strongly agree). The range for the total scale is 12 to 84. Zimet and colleagues (1988) have reported excellent psychometric properties. Cronbach's coefficient alpha is 0.88 for the total scale, and 0.87, 0.85, and 0.91 for the Family, Friend, and Significant Other subscales, respectively. In addition, test-retest reliability for the total scale was .85, and ranged from .72 to .85 on the subscales. Construct validity has been established by an inverse correlation with stress scores (Zimet, et al., 1988). Family support was significantly inversely related to depression (r=-.24) and anxiety (r=-.18). Friend support was inversely related to depression (r=-.24), but not to anxiety. Other support was minimally but significantly related to depression (r=-.13). Additionally, the total support was inversely related to depression (r=-.25), but not to anxiety.

The MSPSS was translated into Chinese by Chou (2000) and revised by the author for the purpose of this study. As such, a preliminary goal of this study was to establish the factor structure of the revised MSPSS-C to determine the factors that were reported through this instrument. In the revised Chinese version, "teacher" takes the place

of "significant other". The items in regard to "teacher" and "friend" are revised to have the exactly same wording as the items for "family". Principal axis factor analysis was used in this study to establish the factor structure of the MSPSS-C and these findings are reported in the results section in this paper.

Test Performance: Scores from a pre-National College Entrance Exam (pre-NCEE) was obtained from the students' homeroom teachers on April, 2011.

Procedure

Written approval to conduct the study was obtained from the participating high school and the principal investigator's University Institutional Review Board (IRB). In the spring of 2011, all 12th grade students were invited to participate in completing the surveys. They were asked to complete four self-rating scales as well as a demographic survey (e.g., gender, age, ethnic background, etc.) during a social studies class period. Prior to completing the scales, students read and signed an assent form. Students were aware of the nature of the study, risks and benefits, confidentiality, and their right to withdraw from the study. Only those who signed an assent form completed the surveys in class. The surveys were administered in a 60 minute class session. After the survey administration, the test scores from the pre-NCEE were collected from the students' homeroom teachers for the purpose of the study. All questionnaires were kept by the researcher and locked in a personal file in the researcher's office in China. All questionnaires were identified by a student ID number. The de-identified data on the questionnaires was entered on the researcher's personal computer with password protection.

Data Analysis

The statistical procedures were carried out using SPSS 17.0 to conduct factor analyses of MSPSS-C and to test hypotheses using a series of hierarchical multiple regressions for each dependent variable (i.e., test anxiety or test performance). Principal axis factor analysis (FA) was used to identify the structure underlying such variables and to estimate scores to measure latent factors of MSPSS-C. The hierarchical multiple regressions were used to investigate the moderating effects of coping strategies and perceived social support on academic stress, test anxiety, and test performance.

To run multiple regressions, several steps were followed. Step 1 included test anxiety (or test performance) as the dependent variable and academic stress (or test anxiety) as the independent variable. One set of moderators (parent support, or other support, or active coping) was added in Step 2, and interactions between academic stress (or test anxiety) and each moderator were added in Step 3. To reduce nonessential conlinearlity in the model, continuous variables were centered by subtracting the respective means from each of the variables before computing interaction terms (Aiken & West, 1991). The interaction variable (i.e., test anxiety and parent/other support) was obtained by multiplying the centered main variable (test anxiety) and centered moderator variable (parent support or other support). Additionally, the plots were constructed by plotting low and high scores on perceived social support, and the variables that showed significant moderation in the hierarchical regression analysis. For this, Jose's (2002) Excel version of ModGraph program was used. Low support (parent support, or other support) group composed of participants whose scores under means, while high group composed of those whose scores were over means.

Results

To determine the relationships of academic stress, test anxiety, coping strategies, perceived social support, and test performance, several different statistical analyses were used. Principal axis factor analysis (FA) was used to establish the factor structure of the MSPSS-C. Bivariate correlations were used to examine the correlations existed among variables of academic stress, test anxiety, test performance, active coping strategy, and perceived social support from parent and others. A series of hierarchical multiple regressions were used to explore the moderating effects of coping strategies and perceived social support on the relationships between academic stress, test anxiety, and test performance.

Preliminary Findings: Factor Analysis of MSPSS-C

A preliminary study was conducted to analyze the factors of MSPSS-C by using a principal axis factor analysis (FA) with varimax rotation in order to obtain a simple structure to explain the factors. All 12 items of the MSPSS-C were included in the FA. Eigenvalues for factors, Catell's scree test, and Parallel Analysis (PA) were used to determine the number of factors to retain. The FA resulted in the identification of two factors with eigenvalues over 1.00 that accounted for 82.59% of the variance (see Table 1). Because of the large sample size (Stevens, 1996), Catell's scree test and PA were also used. Scree test and PA suggested that two factors were most appropriate. The two factors were: family (parent) support and other support (teachers and peers).

Factor one, parent (family) support, contained items that describe students' perceived social support from parent (family), such as "My family can provide me actual help" (.91), and "My family can provide me emotional help and support if I need" (.76).

This factor had 4 items that loaded at .76 or above. This scale had a reliability coefficient of .945 and accounted for 32.00% of the variance.

Factor two, other support, contained items that describe students' perceived social support from others (teacher or friend), such as "I can talk about my problems with my teacher" (.89), and "My friend can provide me with actual help" (.82). This factor had 8 items that loaded at .696 or above. This scale had a reliability coefficient of .962 and accounted for 47.36% of the variance.

Table 1
Actual Eigenvalues and Random Eigenvalues of the Factors

Factor	Initial Eigenvalues			95% Random Eigenvalues
	Total	% of Variance	Cumulative %	
1	8.354	69.619	69.619	1.252
2	1.557	12.972	82.591	1.167
3	.417	3.477	86.067	1.146
4	.301	2.507	88.574	1.137
5	.245	2.043	90.617	1.070
6	.230	1.913	92.530	1.016
7	.206	1.718	94.248	.947
8	.188	1.567	95.815	.940
9	.147	1.225	97.041	.907
10	.129	1.078	98.119	.856
11	.125	1.040	99.159	.814
12	.101	.841	100	.727

Univariate Relationships among Academic Stress, Test Anxiety, Test Performance, Coping Strategies, and Perceived Social Support

The results of means, standard deviations, and zero-order correlations are presented in Table 2. The current TAI produced scores that are similar to those TAI scores (means=35.01, standard deviation=9.84) obtained by Lin (2007). The current SCSQ scores are similar to those SCSQ scores (M of active coping=23.9, SD of active coping=6.9; M of passive coping=10.9, SD of passive coping=4.1) obtained by Han and her colleges (2011). The MSPSS-C scores in this study are close to those MSPSS scores (M of family=5.80, SD of family=1.12; M of significant other=5.74, SD of significant other=1.25) in Zimet and his colleagues (1988)'s study.

The univariate relationships between academic stress, test anxiety, test performance, coping strategies, and perceived social support included: positive strong relationships between academic stress and test anxiety (r=.52, p<.01), which supported hypothesis 1; negative moderate relationships between academic stress and test performance (r=-.43, p<.01), as well as between test anxiety and test performance (r=-.37, p<.01), which supported hypotheses 2 and 3. The table also revealed positive moderate relationships between active coping and test performance (r=.32, p<.01). All other correlations between these variables were low (between .10 and .22).

Hierarchical Regression Analyses for Moderating Effects of Active Coping Strategies on the Relationships between Academic Stress, Test Anxiety, and Test Performance

It is hypothesized that active coping will moderate the relationship between (a) academic stress and test anxiety; (b) test anxiety and test performance; and (c) academic stress and test performance, making each of these relationships attenuated at higher levels

Table 2
Means, SD, and Intercorrelations among Main Variable

	Mean	SD	Academic Stress	Test Anxiety	Active Coping	Parent Support	Other Support
Academic Stress	79.28	17.53	-				
Test Anxiety	38.09	7.53	.52**	-			
Active Coping	24.83	4.89	-.17**	-.19**	-		
Parent Support	6.21	0.94	-.10*	-.13**	.22**	-	
Other Support	4.24	1.31	-.16**	-.22**	.16**	.68**	-
Test Performance	440.48	86.30	-.43**	-.37**	.32**	.14**	.19**

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

of active coping. In order to test the moderating effects of active coping strategies, three hierarchical regression analyses were carried out to examine the moderating effects of active coping strategies on the relationships between academic stress and test anxiety, between academic stress and test performance, as well as between test anxiety and test performance. The analyses revealed that each of these interaction effects was not significant (see tables 3, 4, & 5). Thus, coping strategies were not meaningful moderators of the relationships among academic stress, test anxiety, and test performance. These findings did not support hypotheses 4, 5, and 6.

Hierarchical Regression Analyses for Moderating Effects of Perceived Social Support on the Relationships between Academic Stress, Test Anxiety, and Test Performance

It is hypothesized that parent support and other support will moderate the relationships between (a) academic stress and test anxiety; (b) test anxiety and test performance; and (c) academic stress and test performance, weakening these relationships at higher levels of parent/other support. In order to test the moderating

Table 3

Hierarchical Regression Analyses for Moderating Effects of Active Coping Strategies on the Relationships between Academic Stress, Test Anxiety, and Test Performance

	Step 1		Step 2		Step 3	
Test Anxiety	*β*	*t*	*β*	*t*	*β*	*t*
Academic Stress	.50**	12.37			.50**	12.23
Active Coping			-.10**	-2.47	-.11**	-2.58
Academic Stress x Active Coping					-.04	-1.09

Table 4

Hierarchical Regression Analysis of Academic for Moderating Effects of Active Coping Strategies on the Relationship between Academic Stress and Test Performance

	Step 1		Step 2		Step 3	
Test Performance	*β*	*t*	*β*	*t*	*β*	*t*
Academic Stress	-.39**	-9.24			-.39**	-9.20
Active Coping			.26**	6.18	.26**	6.13
Academic Stress x Active Coping					.001	.03

Table 5

Hierarchical Regression Analysis of Academic for Moderating Effects of Active Coping Strategies on the Relationship between Test Anxiety and Test Performance

	Step 1		Step 2		Step 3	
Test Performance	*β*	*t*	*β*	*t*	*β*	*t*
Test Anxiety	-.32**	-7.54			-.32**	-7.48
Active Coping			.26**	6.10	.26**	6.00
Test Anxiety x Active Coping					.003	.06

effects of perceived social support (parent support and other support), six hierarchical regression analyses were carried out to examine the moderating effects of parent support and other support on the relationships between academic stress, test anxiety, and performance. The analyses revealed that the interaction effects of parent support (F[3,444] = 27.814, P<.001) and other support (F[3,444] = 28.783, P<.001) on the relationships between test anxiety and performance were significant (see tables 6& 7). These significant interacting effects provided partial support for hypotheses 7 and 8. The findings for these hypotheses are discussed further in the next paragraph.

Although the interaction effects of parent support and other support on the relationships between test anxiety and test performance were significant, the directions of the effects were different from the predictions. The procedures recommended by Aiken and West (1991) were used to further examine these interaction effects. These procedures entail centering variables, in other words creating new variables in which the mean has been subtracted from each value. The interaction variable (test anxiety and parent/other support) was obtained by multiply the centered main variable (test anxiety) and centered moderator variable (parent support or other support).The relationship between test

Table 6

Hierarchical Regression Analysis of Academic for Moderating Effects of Perceived Parent Support on the Relationship between Test Anxiety and Test Performance

	Step 1		Step 2		Step 3	
Test Performance	*β*	*t*	*β*	*t*	*β*	*t*
Test Anxiety	-.36**	-8.17			-.36**	-8.19
Parent Support			.09*	2.05	.10*	2.35
Parent Support x Test Anxiety					-.11*	-2.43

Table 7
Hierarchical Regression Analysis of Academic for Moderating Effects of Perceived Other Support on the Relationship between Test Anxiety and Test Performance

	Step 1		Step 2		Step 3	
Test Performance	*β*	*t*	*β*	*t*	*β*	*t*
Test Anxiety	-.35**	-7.78			-.35**	-7.87
Other Support			.11*	2.47	.13**	2.86
Other Support x Test Anxiety					-.11*	-2.55

anxiety and test performance was compared for students with low levels of perceived social support (subtracting one standard deviation from its centered values) versus those with high levels of perceived social support (adding one standard deviation from its centered values). As noted in Figure 4, a significantly stronger negative relationship existed between test anxiety and test performance for those reporting a high level of perceived parent support compared to those reporting a low level of perceived parent support, $t(444) = -2.431$, $p<.05$. Further examination of Figure 4 revealed that for low levels of test anxiety (subtracting one standard deviation from its centered values) there was a substantial difference on test performance between the students reporting high parent support and those reporting low parent support. The students with low test anxiety who reported high levels of parent support outperformed those reporting low levels of parent support. In contrast, for high levels of test anxiety (adding one standard deviation from its centered values), there was no difference on test performance between the students reporting high parent support and those reporting low parent support.

Results also suggested that other support significantly moderated the relationship between test anxiety and performance. As noted in Figure 5, a significantly stronger negative relationship existed between test anxiety and test performance for those reporting a high level of perceived other support compared to those reporting a low level of perceived other support, $t(444) = -2.548$, $p<.05$. Further examination of Figure 5 revealed that for low levels of test anxiety there was a substantial difference on test performance between the students reporting high other support and those reporting low other support. The students with low test anxiety who reported high levels of other support outperformed those reporting low levels of other support. In contrast, for high levels of test anxiety, there was no difference on test performance between the students reporting high other support and those reporting low other support.

The analyses also revealed significant interaction effects of parent support ($F[3,444] =61.111$, $P<.001$) and other support ($F[3,444]=62.891$, $P<.001$) on the

Figure 4
Moderating Role of Parent Support on the Relationship between Test Anxiety and Test Performance

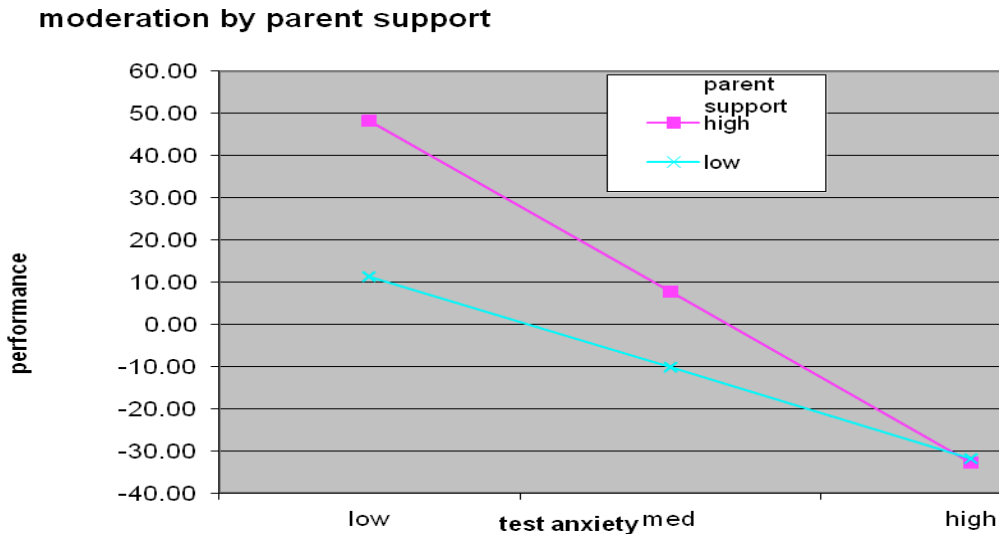
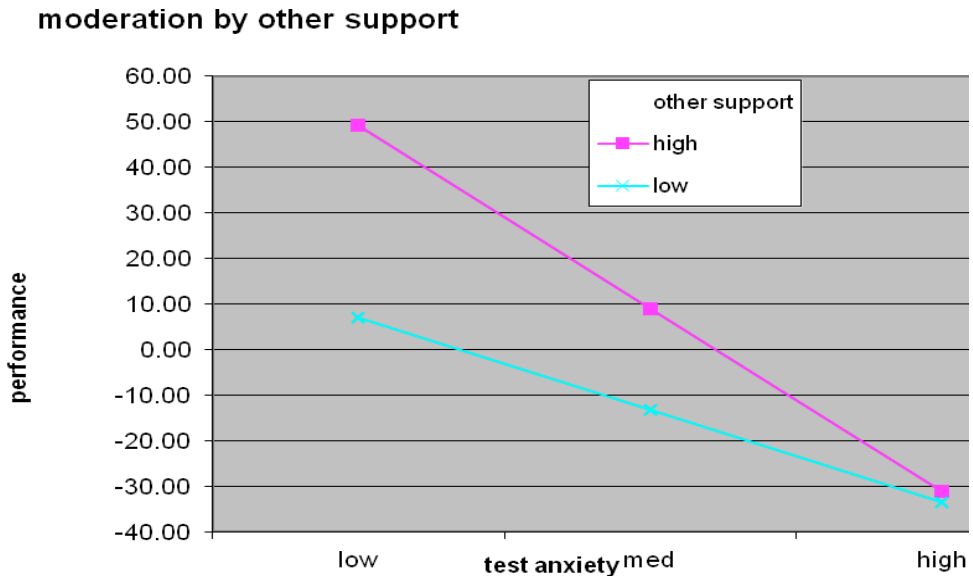


Figure 5
Moderating Role of Other Support on the Relationship between Test Anxiety and Test Performance



relationships between academic stress and test anxiety (see tables 8 & 9). These significant interacting effects provided partial support for hypotheses 9 and 10 and these results are discussed further in the next paragraph.

Table 8
Hierarchical Regression Analysis for Moderating Effects of Perceived Parent Support on the Relationship between Academic Stress and Test Anxiety

	Step 1		Step 2		Step 3	
Test Anxiety	*β*	*t*	*β*	*t*	*β*	*t*
Academic Stress	.51**	12.66			.51**	12.77
Parent Support			-.08*	-1.89	-.09*	-2.21
Parent Support x Academic Stress					.12**	3.06

Table 9
Hierarchical Regression Analysis for Moderating Effects of Perceived Other Support on the Relationship between Academic Stress and Test Anxiety

	Step 1		Step 2		Step 3	
Test Anxiety	*β*	*t*	*β*	*t*	*β*	*t*
Academic Stress	.50**	12.33			.49**	12.26
Other Support			-.14**	-3.42	-.15**	-3.59
Other Support x Academic Stress					.09*	2.26

Although the interacting effects of parent support and other support on the relationships between academic stress and test anxiety were significant, the directions of the effects were different from the predictions. The procedures recommended by Aiken and West (1991) were used to further examine these interaction effects. The relationship between academic stress and test anxiety was compared for students with low levels of perceived social support versus those with high levels of perceived social support. As noted in Figure 6, a significantly stronger positive relationship existed between academic stress and test anxiety for those reporting a high level of perceived parent support compared to those reporting a low level of perceived parent support, $t(444)=3.059$, $p<.01$. Further examination of Figure 6 revealed that for low levels of academic stress (subtracting one standard deviation from its centered values) there was a substantial difference on test anxiety between the students reporting high parent support and those reporting low parent support. Under condition of low academic stress, the students who reported high levels of parent support had significantly lower test anxiety than those reporting low levels of parent support. In contrast, for high levels of academic stress (adding one standard deviation from its centered values), there was no difference on test

anxiety between the students reporting high parent support and those reporting low parent support.

Results also suggested that other support significantly moderated the academic stress to test anxiety relationship. As noted in Figure 7, a significantly stronger positive relationship existed between academic stress and test anxiety for those reporting a high level of perceived other support compared to those reporting a low level of perceived other support, $t(444)=2.255$, $p<.05$. Further examination of Figure 7 revealed that for low levels of academic stress there was a substantial difference in test anxiety between the students reporting high other support and those reporting low other support. Under conditions of low academic stress, the students who reported high levels of other support had significantly lower test anxiety than those reporting low levels of other support. In contrast, for high levels of academic stress, there was very little difference on test anxiety between the students reporting high other support and those reporting low other support.

Figure 6
Moderating Role of Parent Support on the Relationship between Academic Stress and Test Anxiety

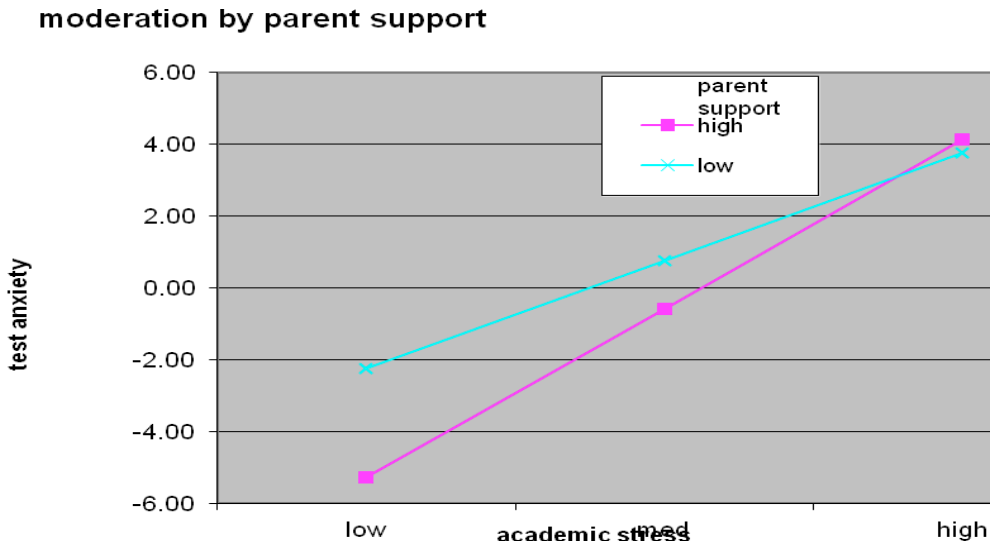
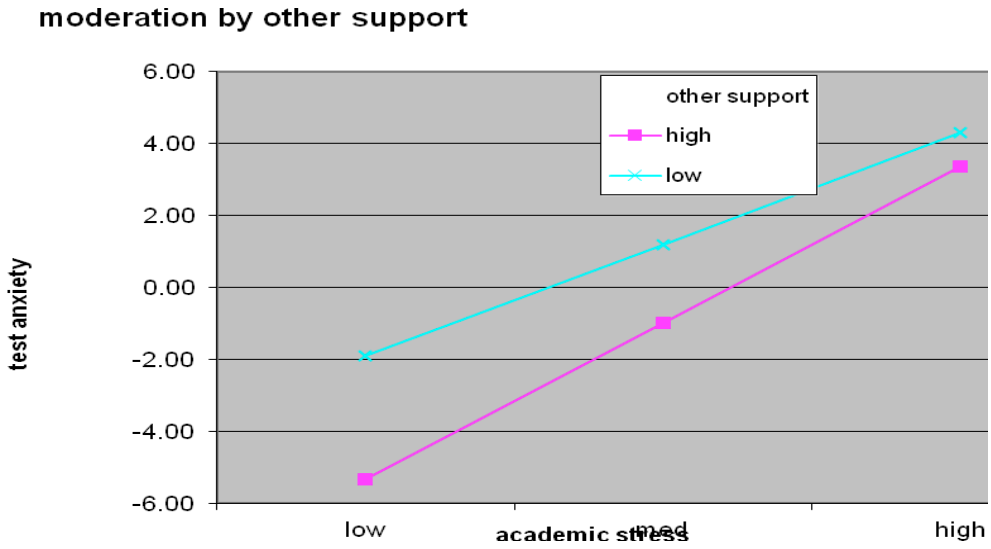


Figure 7
Moderating Role of Other Support on the Relationship between Academic Stress and Test Anxiety



It is predicted that the negative relationship between academic stress and test performance will be attenuated at higher levels of perceived parent support as well as at higher levels of perceived other support. The analyses revealed that there were no significant interaction effects for parent support and other support on the relationships between academic stress and test performance (see tables 10 & 11). These results failed

Table 10
Hierarchical Regression Analysis for Moderating Effects of Perceived Parent Support on the Relationship between Academic Stress and Test Performance

	Step 1		Step 2		Step 3	
Test Performance	*β*	*t*	*β*	*t*	*β*	*t*
Academic Stress	-.42**	-9.78			-.42**	-9.77
Parent Support			.09**	2.19	.09**	2.19
Parent Support x Academic Stress					.002	.04

Table 11
Hierarchical Regression Analysis for Moderating Effects of Perceived Other Support on the Relationship between Academic Stress and Test Performance

	Step 1		Step 2		Step 3	
Test Performance	*β*	*t*	*β*	*t*	*β*	*t*
Academic Stress	-.41**	-9.51			-.41**	-9.47
Other Support			.12**	2.81	.12**	2.83
Other Support x Academic Stress					-.02	.41

to support hypotheses 11 and 12. Perceived social supports from parent and others were not meaningful moderators on the relationship between academic stress and test performance.

Discussion

The present study established a framework for understanding the relationships involved among a variety of risk and protective factors for Chinese high school students in a stressful testing situation. In particular, this framework contributes to understanding the moderating role of perceived social support and active coping strategies on the relationships between academic stress, test anxiety, and test performance of Chinese high school students when faced with the pre-NCEE. The purpose of this study was twofold: (a) assess the relationships between academic stress, test anxiety, and test performance (hypotheses 1, 2, and 3) and (b) determine the roles of active coping strategies (hypotheses 4, 5, and 6) and perceived social support (hypothesis 7-12) as moderating variables that might buffer the relationships between academic stress, test anxiety, and test performance. The literature review suggests that this is the first systematic study of the moderating effects of active coping strategies and perceived social support on the

relationships between academic stress, test anxiety, and performance among Chinese high school students. Given this unique focus and the significant findings about moderating effects for social support as well as the convenience sample employed, the implications of results obtained regarding these moderating effects are preliminary and have implications for future research.

Academic Stress, Test Anxiety, and Test Performance

One purpose of the present research was to examine the univariate relationships between academic stress, test anxiety, and test performance. As expected, academic stress was positively associated with test anxiety among Chinese high school students. This result is in keeping with the large body of research linking academic stress to poorer test anxiety in both Western countries and China (Aldwin & Greenberger, 1987; Leung, Yeung, & Wong, 2010; Wang & Ding, 2003). The current findings extended past research by showing that the same result is found in this sample of Chinese high school students who are faced with taking the pre-NCEE. The relationship between academic stress and test performance is in line with previous studies that found higher academic stress related to lower test performance (Clark & Rieker, 1986; Liao, 2007; Linn & Zeppa, 1984; Struthers et al., 2000). Also, in accordance with previous research in China (Liao, 2007), a negative relationship was found between academic stress and test performance in this sample of Chinese high school students preparing for the pre-NCEE. Test anxiety and performance on the test were also negatively related in the current study, which is consistent with a large body of previous investigations (Chen, 2006; Hembree, 1988; Jiang & Zhang, 2006; Li, 2003; Li, Liu, Lan, & Ma, 2009; Liao, 2007; Liu & Guo,

2003; Masson et al, 2004;Seipp, 1991; Schwarzer, 1990; Ye, Ji, Tao, Wang, & Wang, 1999; Zeinder, 2007, 2008).

Moderating Effects of Active Coping Strategies and Perceived Social Support

As noted earlier, the most unique findings from this research concerned the data regarding the moderating roles of active coping strategies and perceived social support on the relationships between academic stress, test anxiety and test performance. In these analyses, none of the reported active coping strategies were found to have a moderating effect on the relationships between academic stress, test anxiety, and test performance. The results of the current study failed to support Zeidner's (1994) findings that task-oriented coping (active coping) moderated the relationship between academic stress and anxiety level in a testing situation. Given the present findings, future research on the moderating effects of coping may try to account for many potentially influential factors, such as the different culture, sample, instrument, and so forth, which may contribute to the contradictory results. Similarly, no moderating effects of active coping strategies were found for the relationship between academic stress (or test anxiety) and test performance. In contrast, there was a positive direct effect of active coping strategies on test performance. The positive relationship between active coping strategies and test performance is in line with previous studies in both the Western countries and China (e.g., Stuthers et al., 2000; Liao, 2007). Because only one study (Zeidner, 1994) found in the literature investigated the moderating effect of task-oriented coping (active coping) strategies in a testing situation, further efforts are needed to examine the potential buffering roles of active coping strategies on the relationships between academic stress,

test anxiety, and test performance, in both the Eastern countries (i.e., China) and Western countries.

As known from the results, the perceived social support moderated the relationships between test anxiety and test performance, but in a different direction than predicted. The current findings suggested that a stronger relationship existed between test anxiety and test performance when students reported a high level of perceived social support from parents and others (teachers and friends). For low levels of test anxiety (one standard deviation below mean), the students who reported high parent (one standard deviation above mean) or other support outperformed those reporting low levels of parent or other support (one standard deviation above mean). In contrast, no or very little difference was found between those with high and low levels of support under conditions of high test anxiety (one standard deviation above mean). Meanwhile, the perceived social support moderated the relationships between academic stress and test anxiety in a different direction than predicted. The findings suggested that a stronger relationship existed between academic stress and test anxiety when students reported a high level of perceived social support from parents and others (teachers and friends). Under condition of low academic stress (one standard deviation below mean), those who reported high levels of parent or other support had significantly lower test anxiety than those reporting low levels of parent other support. In contrast, no or very little difference was found between those with high and low levels of support under conditions of high academic stress (one standard deviation above mean). These results provided evidence that when students experience low academic stress or test anxiety, social supports from family, friends, and teachers may result in improved affective outcomes (i.e., low test anxiety) or

academic performance. In contrast, when academic stress and test anxiety were high, support from parents and teachers did not provide help to students. One possible explanation is that under conditions of high anxiety or high stress, any support (no matter high or low) from parents and others might be interpreted as adding to the anxiety or stress level to prepare for the examination, which may result in low test performance or high test anxiety. This may help to explain the lack of effects for social support on test performance or test anxiety for those experiencing high test anxiety or high stress. Further research is needed to understand the contradictions of these findings regarding the moderating effects of social support when compared with prior literature from Western countries. Some of the factors that might contribute to these conflicting findings include differences in measurement, definitions and perceptions of academic stress, test anxiety, and social support, cultural differences (i.e., Eastern verses Western), or other differences between samples (i.e., ethnicity, age level, time of year, nature of testing experienced by students). Further investigation of a combination of these factors is needed to examine these complicated phenomena. Most importantly, because students did not benefit from the availability of parent and other support when they had high academic stress and test anxiety, more research is needed to learn about factors that may lead to improved performance for those under high conditions of stress and anxiety.

In addition, the present study found a direct negative relationship between academic stress on test performance, but did not find an interactive role for perceived social support on the relationship between academic stress and test performance. Future research is needed to confirm the lack of moderating effects for perceived social support and to learn more about the potential roles of social support.

Limitations and Directions for Future Research

The results of this study must be viewed within the context of several limitations. First, this analysis relied on self-report information. Subjects might either over-report or under-report their perceptions regarding personal variables. Some students may over-report their test anxiety or academic stress to make an excuse for their test performance failure; whereas others may under-report test anxiety or academic stress to disguise their true feelings and create the image that they are mentally healthy. It is suggested future research be conducted using valid measures of these constructs by using physiological measures to examine stress and anxiety or using rating scales from other parties (e.g., parents, teachers) regarding academic stress, test anxiety, social support, and coping strategies.

Second, the study population was restricted to a single Chinese key high school. Therefore, results of the study may not be generalized to other population (elementary or middle school students) or schools (e.g., general public schools or private schools). However, the problems of academic stress and test anxiety may affect students at all the levels of the Chinese education system, therefore, future research should include students from all academic levels and from different types of schools in China to examine the roles of perceived social support and coping strategies on the relationships between the variables. Moreover, future study should investigate the same phenomena using the NCEE test rather than the pre-NCEE test which may heighten stress and anxiety.

Third, perceived social support and coping strategies were assessed as general tendencies, rather than specific responses tied to the students' testing situation. For example, the items on MSPSS-C only obtained the general information of perceived

social support from family, teacher, and friends, which covered no specific information in regard to the students' academic or testing situation (e.g., "My family really tries to help"). The development of more precise and culturally sensitive measures of the particular aspects of social support and coping relevant to this particular stressful situation may help to avoid these limitations.

The present study provided evidence of an interactional model of perceived social support in a stressful testing situation although the findings revealed that the direction of moderating effects of perceived social support on the relationships between academic stress, test anxiety, and test performance were inconsistent with previous studies. These findings contribute to an emerging body of literature illustrating the buffering effects of perceived social support. Further research is needed to clarify how perceived social support moderates these associations. The study fails to support the moderating roles of active coping strategies on the relationships between academic stress, test anxiety, and test performance. Future research may continue exploring the potential buffering roles of active coping strategies and social supports, as well as investigating the possible mediating effects of these variables for students from different cultures taking high-stake tests.

References

Aiken, L.S., & West, S.G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.

Albrecht, T., & Adelman, M. (1987). *Communicating social support.* Newbury Park, CA: Sage.

Aldwin, C., & Greenberger, E. (1987). Cultural differences in the predictors of depression. *American Journal of Community Psychology, 15,* 789–813.

Arnold, L.E. (ed.) (1990). *Childhood Stress*, John Wiley, New York.

Blumberg, P., & Flaherty, J.A. (1985). The influence of non-cognitive variables on student performance. *Journal of Medical Education, 60,* 721–723.

Chen, X. (2004). Research on Middle School Students' Academic Stresses, Coping Strategies, and Coping Psychological Mechanisms. Doctoral dissertation. Chongqing: South-west Normal University.

Chen, S. (2006). Correlations between cognitive components of test anxiety and academic performance of students in junior middle school. *Journal of Clinical Psychosomatic Diseases, 12*(1), 35-38.

Chen, W., Siu, O., Lu, J., Cooper, C., and Philips, D. (2009). Work stress and depression: The direct and moderating effects of informal social support and coping. *Stress and Health, 25,* 431-443

Chou, K.L. (2000). Assessing Chinese adolescent' social support: the multidimensional scale of perceived social support. *Personality and Individual Difference, 28,* 299-307.

Clark, E.J. & P.P. Rieker (1986). Gender differences in relationships and stress of medical and law students. *Journal of Medical Education, 61*(1), 32-40.

Cohen, S., & Wills, T.A. (1985). Stress, social support and the buffering hypothesis. *Psychological Bulletin, 98,* 310–357.

Cohen, S. (2004). Social relationships and health. *American Psychologist, 59*, 676–684.

Compas, B.E., Champion, J.E., & Reeslund, K.R. (2005). Coping with stress: Implications for preventive interventions with adolescents. *The Prevention Researcher, 12,* 17-20. Reprinted in Stickle, F.E. (ed), (2008), *Adolescent Psychology*, 6th ed. New York: McGraw-Hill.

Culler, R.E., & Holahan, C.J. (1980). Test anxiety and academic performance: The effects of study-related behaviors. *Journal of Educational Psychology, 72*(1), 16-20.

Cutrona, C.E., V. Cole, N. Colangelo, S.G. Assouline & D.W. Russel (1994). Perceived parental social support and academic achievement: An attachment theory perspective. *Personality and Social Psychology, 66*(2), 369-378.

Dai, J., Yan, K., & Wang, H. (2004). Research on relationship between test anxiety, coping style, and social support of senior middle school students. *Chinese Journal of Behavioral Medical Science, 13*(5), 548-549.

Endler. N.S. & Parker, J.D.A. (1990). Stress and anxiety: Conceptual and assessment issues. *Special Issue: Advances in Measuring Life Stress, 6*, 243-248.

Felsten, G. & K. Wilcox (1992). Influences of stress and situation specific mastery beliefs and satisfaction with social support on well-being and academic performance. *Psychological Reports, 70*(1), 291-303.

Feng, Y. (1999). National College Entrance Examinations: The dynamics of political centralism in China's elite education. *Journal of Education, 181*(1), 39-57.

Folkman, S., and Lazarus, R.L. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior, 21,* 219–239.

Ge, Y. (2008). A Correlating Study on Relations among Learning Stress, Test Anxiety, Self-efficacy, and learning strategy of Junior Students, Master dissertation, North-east Normal University.

Glaser, D.N., Tatum, B., Nebeker, D., Sorenson, R., & Aiello, J.R. (1999). Workload and social support: Effects on performance and stress. *Human Performance, 12,* 155-176.

Goldsmith, D., & Albrecht, T. (1993). The impact of supportive communication networks on test anxiety and performance. *Communication Education, 42,* 142-158.

Han, M., Jia, C. X., Qiu, H. M., Ma, J. X., Lu, C. F., & Liu, H. (2011). Psychometric characteristics of the Simplified Coping Style Questionnaire and association between coping style and rural suicide. *Journal of Shandong University, 49*(10), 160-164.

Hauck, E., Snyder, L.A., & Cox-Fuenzalida, E.L. (2008). Workload variability and social support: Effects on stress and performance. *Current Psychology, 27,* 112-125.

Hembree, R. (1988). Correlates, causes, effects, and treatment of test anxiety. *Review of Educational Research, 58,* 47-77.

Hockey, R. (1979). Stress and the cognitive components of skilled performance. In V. Hamilton & D. M. Hamilton (Eds.), *Human stress and cognition* (pp. 141-177). Chichester, U. K.: John Wiley & Sons.

Hodapp, V., Glanzman, P.G., & Laux, L. (1995). Theory and measurement of test anxiety as a situation-specific trait. In C.D., Spielberger & P., R. Vagg (Eds.), *Test anxiety: Theory, assessment, and treatment.* Washington, DC: Taylor & Francis.

Jiang, Q., & Zhang, D. (2006). Confirmatory factory analysis on the dimension of the examination mental problem of middle school students. *Science of Psychology, 9*(1), 165-167.

Jose, P.E. (2002), "ModGraph – A computer programme to graphically display moderation", available at: www.victoria.ac.nz/psyc/staff/paul-jose/files/helpcentre/help1_intro.php.

Kohn, J.P., & Frazer, G.H. (1986). An academic stress scale: Identification and rated importance of academic stressors. *Psychological Reports, 59,* 415–426.

Lazarus, R.S., and Folkman, S. (1984). *Appraisal, Stress, and Coping.* New York: Springer.

Lazarus, R.S. (1999). *Stress and emotion: A new synthesis.* New York: Springer.

Lee, M., & Larson, R. (2000). The Korean ''Examination Hell'': Long hours of studying, distress and depression. *Journal of Youth and Adolescence, 29,* 249–271.

Leung, G., Yeung, K. K., & Wong, D. (2010). Academic stressors and anxiety in children: The role of paternal support. *Journal of Child & Family Studies, 19*(1), 90-100.

Li, X. (2003). On the correlations between social-support and anxiety of the students in grade three of senior middle school. *Journal of Binzhou Teachers College, 19*(4), 5-8.

Li, Y., Liu, Z., Lan, J., & Ma, L. (2009). Research on the relationship between achievement motivation, test anxiety, and academic performance among high school students. *New West, 4*, 153-154.

Liao (2007). Research on the relationship between pressure in college entrance examination, coping strategies and examination results. Master dissertation, South-west University.

Liebert, R.M., & Morris, L, W. (1967). Cognitive and emotional components of test anxiety: A distinction and some initial data. *Psychological Reports, 20,* 975-978.

Lin, X. (2007). Assessment standard of test anxiety inventory in middle school students and its reliability and validity studies. Master dissertation. Hunan Normal University.

Linn, B.S. & R. Zeppa (1984). Stress in junior medical students: Relationship to personality and performance. *Journal of Medical Education, 59*(1), 7-12.

Liu, H. & Guo, D. (2003). Research on the relationship between test anxiety, achievement goal, and test performance. *Developmental Psychology and Education, 2,* 64-67.

Lou, W., & Chi, I. (2000). The stressors and psychological well-being of senior secondary school students. *Psychological Science China, 23,* 156–159.

Masson, A.M., Hoyois, P., Pcadot, M., Nahama, V., Petit,F., & Ansseau, M. (2004). Girls are more successful than boys at the university: Gender group differences in models integrating motivational and aggressive components correlated with test-anxiety. *Encephale. 30*(1), 1-15.

Misra R, McKean M (2000). College Students' Academic Stress and its Relation to their anxiety, time management, and leisure Satisfaction, *American Journal of Health Studies. 16*(1), 41-51.

Orpen, C. (1996). The interactive effects of social support and text anxiety on student academic performance. *Education, 116*(3), 464-466.

Pearlin, L.I., and Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior 19*, 2–21.

Picot, S.J. (1995). Rewards, costs, and coping of African-American caregivers. *Nursing Research, 44,* 147-152.

Sarason, I.G. (1978). T*he test anxiety scale: concept and research.* In C.D. Spielberger & I. (Vol. 5). Washington, DC: G. Sarason (Eds.), Stress and anxiety Hemisphere Publishing Corp.

Schwarzer, R. and Jerusalem, M. (1992). Advances in anxiety theory: A cognitive process approach. In K. A. Hagtvet and T. B. Johnsen (Eds.), *Advances in test anxiety research* (Vol. 7, pp. 2-17). Lisse, The Netherlands: Swets & Zeitlinger

Schwarzer, R. (I 990). Current trends in anxiety research. In P. J. D. Drenth, J. A. Sergeant, & R. J. Takens (Eds.), *European Perspectives in Psychology.* Vol. 2. (pp. 225-244.) Chichester, UK: John Wiley & Sons.

Seipp, B. (1991). Anxiety and academic performance: A meta-analysis of findings. *Anxiety Research, 4,* 27-41.

Sorensen, E. S. (1993). The family perspective: Theoretical and methodological notes. In *Children's stress and coping: A family perspective* (pp. 25–49). New York: Guilford Press.

Spence, K. (1958). A theory of emotionally based drive (D) and its relation to performance in simple learning situations. *American Psychologist, 13,* 131-141.

Spielberger, Gonzalez, H.P., Taylor, C., G., Anoton, W.D., Algaze, B., Ross, G.K., & Westberry, L.G. (1980). *Test Anxiety Inventory.* Palo Alto, CA: Consulting Psychologists Press.

Struthers, C.W., R.P. Perry & V.H. Menec (2000). An examination of the relationships among academic stress, coping motivation, and performance in college. *Research in Higher Education, 41*(5), 581-592.

Wang, J., & Ding, X. (2003). A study on the influential factors on anxiety of secondary school students. *Chinese Journal of Clinical Psychology, 11*(3), 164–166.

Zhao,J., Xu, J., & Xie, Y. (2006). Research on college and university students' self-reported health problems. *Chinese Journal of Behavioral Medical Science, 15*(6), 546-548.

Wills, T.A., & Cleary, S.D. (1996). How are social support effects mediated: A test for parental support and adolescent substance use. *Journal of Personality and Social Psychology, 71,* 937-952.

Wills, S., & Leathem, J. (2004). The effects of test anxiety, age, intelligence level, and arithmetic ability on Paced Auditory Serial Addition Test Performance. *Applied Neuropsychology, 11*(4), 178-185.

Wong, P.T.P., & Wong, L.C.J. (Eds.). (2006). *Handbook of multicultural perspectives on stress and coping.* New York, NY: Springer.

Xie, Y. (1998). Reliability and validity of the simplified coping style questionnaire. *Chinese Journal of Clinical Psychology, 6,* 114-115.

Ye, M., Ji, F., Tao, J., Wang, L., & Wang, X. (1999). Psychological change of senior students and its effect on college en trance examination. *Chinese Journal of Behavioral Medical Science, 8*(1), 18-20.

Ye, R. (1989). The relationship between middle school students' achievement motivation, test anxiety, and intellectual level, and academic performance. *Applied Psychology, 3*, 11-14.

Zeidner, M. (1994). Adaptive coping with test situations: A review of the literature. *Educational Psychologist, 30,* 123-133.

Zeidner, M. (1995). Coping with examination stress: Resources, strategies, outcomes. *Anxiety, Stress and Coping, 8,* 279-298.

Zeidner, M. (2007). Test anxiety in educational contexts: Concepts, findings, and future directions. In P. A. Schutz, & R. Pekrun (Eds.), *Emotion and education* (165-184). San Diego, CA: Elsevier INC.

Zeidner, M. (1997). Cross-cultural and individual differences in test anxiety. *World Psychology, 3,*143-175.

Zeinder, M. (2008). Anxiety revisited: Theory, research, applications. In G. Boyle, D. Saklofske, & G., Matthews (Eds.), *Handbook of personality assessment, 1*, 423-446. Beverly Hills, CA: Sage.

Zhen, L., Wan, L., & Li, Z. (2001). Linear regression analysis of the effects of academic stress on students' mental and physical health. *Chinese School Health, 3,* 224-225.

Zimet, G.D., Dahlem, N.W., Zimet, S.G. & Farley, G.K. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment, 52,* 30-41.

APPENDIXES

APPENDIX A

STUDENT INFORMED CONSENT

学 生 同 意 书

我，肖娟，是来自美国佐治亚州立大学咨询和心理系的研究生，现在正在从事一项科研项目，题为“探讨学习压力，考试焦虑，社会关系，及应对策略，对学习成绩相互作用的关系”。此项研究的目的是为了探索学习压力，考试焦虑，社会关系，及应对策略，对学习成绩的影响作用，以及他们之间的相互作用。贵校全体高三学生（总数约为 675 名）将被邀请参加这项研究。在此，我诚恳地邀请你参加这项研究。因为这项研究将为你的学校提供有用的科研数据，从而更好地服务于广大的学生。

如果你同意参加，你将完成四个自评调查表以及个人信息，为时半个到一个小时时间。四个自评调查表分别为：学习压力量表，考试焦虑量表，领悟的社会关系量表，及简易应对策略量表。我们鼓励你完成所有的量表。同时，如果你选择参与本研究，我们还将收集你的 NCEE 模拟考试成绩。

尽管本次研究不会给你个人带来直接的利益，它将有益于你的学校在今后更好地服务于广大的学生。参与本次研究将不会给你带来任何危险。量表中的有些问题可能涉及一些你认为敏感的问题。但如果遇到不愿意回答的问题，你可以选择不回答，也可以在填写量表的任何时间退出本次研究。另外，本次研究中的所有个人信息将保密。所有的数据信息将锁在保险柜里。我们不会在任何学术期刊上使用你的姓名及个人信息，因此没有人知道你在量表中的答案。参与本次研究属于自愿行为。你可以自己决定是否参与。你也可以选择在填写量表的过程中退出本次研究。如果你改变自己的想法决定退出本次研究，你不会受到任何处罚。如果你还有更多关于本次研究的问题，请发信到我的邮箱 tulipxiao2002@yahoo.com，或者致电 07308827156，与我联系。

如果同意，请在学生签名栏上签下你的姓名。

学生签名　　：_____　　日期：_____

APPENDIX B

DEMOGRAPHIC INFORMATION

基本情况调查表

学号

性别　　：男□ 女□　　年级：　　年龄：

独生子女　　：是□ 否□　　民族：

你的抚养人：父母□　祖/外祖父母 □　其他□

家庭年收入：＜12000 元□ 12000-49999 元□　　＞50000 元□　　不知道□

你的健康状况：很好□　一般□　较差□

APPENDIX C

TEST ANXIETY INVENTORY

NAME: AGE: GRADE:

Instruction: A number of statements which people have used to describe how they feel about taking tests are shown below. Read each one, and then select an answer to indicate how you feel most of the time. Use “almost never”, “sometimes”, “often”, or “almost always” to indicate various degrees of descriptiveness.

	Almost Never	Sometimes	Often	Almost Always
1. I feel confident and relaxed while taking tests.				
2. While taking final examinations I have an uneasy upset feeling.				
3. Thinking about the grade I may get in a course interferes with my work on tests.				
4. I freeze up on final exams.				
5. During exams I find myself wondering whether I will ever get through school.				
6. The harder I work at taking a test, the more confused I get.				
7. Thoughts of doing poorly interfere with my concentration on tests.				
8. I feel very jittery when taking an important test.				
9. Even when I am well prepared for a test, I feel very anxious about it.				
10. I start feeling very uneasy just before getting a test paper back.				
11. During tests I feel very tense.				
12. I wish examinations did not bother me so much.				
13. During important exams I am so tense that my stomach gets upset.				
14. I seem to defeat myself while working on important tests.				
15. I feel very panicky when I take an important exam.				
16. If I were to take an important exam, I would worry a great deal about taking it.				
17. During tests I find myself thinking about the consequences of failing.				
18. I feel my heart beating very fast during important tests.				
19. As soon as an exam is over I try to stop worrying about it, but I just cannot.				
20. During a course examination I get so nervous that I forget facts I really know.				

APPENDIX D

ACADEMIC STRESS SCALE

NAME: AGE: GRADE:

Read each item and then select an answer to indicate how you rate the level of your stress under the situation.

Use “not at all stressful”, “rarely stressful”, “sometimes stressful”, “fairly stressful”, or “extremely stressful” to indicate various degrees of stress level: “Not at all stressful” will be used to indicate that there is no stress under the situation (i.e., excessive homework), and an “extremely stressful” will indicate that you do have very strong stress under the situation.

Of course, there is no right or wrong answer to each item, so do not spend too much time on any one item, but just check the one that indicates best how that statement generally describes you.

	NOT AT ALL STRESSFUL	RARELY STRESSFUL	SOMETIMES STRESSFUL	FAIRLY STRESSFUL	EXTREMELY STRESSFUL
1. Final grades					
2. Excessive homework					
3. Term papers					
4. Examinations					
5. Studying for examinations					
6. Class speaking					
7. Waiting for graded tests					
8. Fast-paced lectures					
9. Pop quizzes					
10. Forgotten assignments					
11. Incomplete assignments					
12. Unclear assignments					

13. Unprepared to respond to questions					
14. Announced quizzes					
15. Studied wrong material					
16. Incorrect answers in class					
17. Missing class					
18. Buying text books					
19. Learning new skills					
20. Unclear course objectives					
21. Hot classrooms					
22. Nonnative language lectures					
23. Boring classes					
24. Attending wrong class					
25. Late dismissals of class					
26. Cold classrooms					
27. Arriving late for class					
28. Forgetting pencil/pen					
29. Note-taking in class					
30. Noisy classroom					
31. Crowded classes					
32. Classes with open discussion					
33. Poor classroom lighting					

APPENDIX E

SIMPLIFIED COPING STYLE QUESTIONNAIRE

NAME: AGE: GRADE:

Instruction: Read each item and then select an answer to indicate how you cope under the stressful situation. Use “never”, “occasionally”, “often”, or “always” to indicate various degrees of coping.

	never	occasionally	often	always
1. Get relieved by studying or substitute activities.	0	1	2	3
2. Talk with people, and share personal worry with people.	0	1	2	3
3. Try to look on the bright side of things.	0	1	2	3
4. Change your mind, and rediscover what the important thing is in your life.	0	1	2	3
5. Don’t take the problem too seriously.	0	1	2	3
6. Stand your ground, and fight for what you want to get.	0	1	2	3
7. Try to come up with a couple of different solutions to the problem.	0	1	2	3
8. Seek for suggestions from relatives, friends, or peers.	0	1	2	3
9. Change something about yourself to deal with the problem.	0	1	2	3
10. Use the experience of other people to deal with similar problems.	0	1	2	3
11. Seek for hobbies, and actively join in variety of recreational activities.	0	1	2	3
12. Try to control your disappointment, regret, sorrow and anger.	0	1	2	3
13. Try to rest or take a leaving to temporally ignore the worry.	0	1	2	3
14. Get rid of worry by smoking, drinking, taking drug, or eating.	0	1	2	3
15. Believe that time will change current status, and waiting is the only thing you should do.	0	1	2	3
16. Try to forget the whole thing.	0	1	2	3
17. Depend on others to solve the problem.	0	1	2	3
18. Accept the reality because there is no other way to solve the problem.	0	1	2	3
19. Imagine that there is a miracle which can change current problem.	0	1	2	3
20. Self-comfort.	0	1	2	3

APPENDIX F

MULTIDIMENSIONAL SCALE OF PERCEIVED SOCIAL SUPPORT

NAME: AGE: GRADE:

Instructions: We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement: Circle the "1" if you Very Strongly Disagree; Circle the "2" if you Strongly Disagree; Circle the "3" if you Mildly Disagree; Circle the "4" if you are Neutral; Circle the "5" if you Mildly Agree; Circle the "6" if you Strongly Agree; Circle the "7" if you Very Strongly Agree.

1.	My family really tries to help me.	1	2	3	4	5	6	7
2.	My teacher really tries to help me.	1	2	3	4	5	6	7
3.	My friend really tries to help me.	1	2	3	4	5	6	7
4.	I get the emotional help and support I need from my family.	1	2	3	4	5	6	7
5.	I get the emotional help and support I need from my teacher.	1	2	3	4	5	6	7
6.	I get the emotional help and support I need from my friend.	1	2	3	4	5	6	7
7.	I can talk about my problems with my family.	1	2	3	4	5	6	7
8.	I can talk about my problems with my teacher.	1	2	3	4	5	6	7
9.	I can talk about my problems with my friend.	1	2	3	4	5	6	7
10.	My family is willing to help me make decisions.	1	2	3	4	5	6	7
11.	My teacher is willing to help me make decisions.	1	2	3	4	5	6	7
12.	My friend is willing to help me make decisions.	1	2	3	4	5	6	7