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THE RELATIONSHIP OF ANXIETY, COPING, THINKING STYLE, LIFE SATISFACTION, SOCIAL SUPPORT, AND SELECTED DEMOGRAPHICS AMONG YOUNG ADULT COLLEGE STUDENTS

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ABSTRACT OF DISSERTATION

Jihan Saber Raja Mahmoud

The Graduate School

University of Kentucky

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SATISFACTION, SOCIAL SUPPORT, AND SELECTED DEMOGRAPHICS AMONG
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ABSTRACT OF DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Nursing
at the University of Kentucky

By
Jihan Saber Raja Mahmoud

Lexington, Kentucky

Co-Directors: Dr. Ruth "Topsy" Staten, Associate Professor Emeritus of Nursing
and   Dr. Terry A. Lennie, Associate Professor of Nursing

Lexington, Kentucky

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Anxiety is prevalent among 13 % of young adult college students and is associated with emotional and behavioral consequences that adversely affect their mental and physical well-being. The major challenge for implementing evidence-based interventions is the lack of a multidimensional approach for evaluating anxiety in this population.

The purpose of this dissertation was to develop an evidence-based theoretical framework for studying the phenomenon of anxiety in young adult college students. Three studies were conducted to achieve this purpose. First, the psychometric properties of the 21-item shortened version of the Depression Anxiety and Stress Scale (DASS-21) were evaluated in a sample of young adult college students. The results indicated that the DASS-21 is a valid and reliable instrument for distinguishing between depression and anxiety in this population. Second, the relative contributions of students' demographics, life-satisfaction, and coping style to their anxiety levels were evaluated. Maladaptive coping style was identified as the main predictor of students' anxiety. Particularly, coping strategies related to negative thoughts, such as self-blaming, and cognitive avoidance, such as denial, were significant predictors of anxiety. Other strategies that are related to behavioral coping such as venting and substance use were not significant predictors of anxiety. Thus, further investigation of the cognitive aspect of anxiety was necessary in the third study.

In the third study, an integrated hypothetical model of the psychosocial, behavioral, and cognitive dimensions of anxiety was proposed and evaluated in this population. Using a web-based survey, 257 undergraduate students were assessed for anxiety, coping style, negative thinking, social support, life-satisfaction and demographics. Path analysis was used to examine the proposed model. Maladaptive coping and negative thinking were directly related to anxiety with negative thinking being the primary predictor of anxiety in this model.

The findings from these studies suggest that the DASS-21 is a valid measure of anxiety and that interventions' that address negative thinking and maladaptive coping should be considered in future research and practice with young adult college students.

KEYWORDS: path analysis, maladaptive, adaptive, negative thinking, anxiety.

Jihan Saber Raja Mahmoud
Student's Signature

January 31, 2011
Date

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January 31, 2011

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This dissertation is dedicated to my mother, Amneh Qasem,
with all my love, respect, and gratitude.
To your love, kindness, patience, nurturing, and sacrifices,
to you for always believing in me and encouraging me;
I could never have done it without you, Mama.

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CHAPTER ONE

Introduction

The prevalence of anxiety among American young adult college students increased from 7% in 2000 (American College Health Association, 2000) to 13% in 2007 (American College Health Association, 2009). While this age group has the highest prevalence of anxiety, they are the least likely to seek treatment resources (Suvisaari, et al., 2008). Longitudinal prospective studies have shown that untreated anxiety symptoms in adolescents and young adults may lead to several behavioral, mental, and physical complications such as alcohol dependence (Kushner, Sher, & Erickson, 1999), nicotine addiction (Sonntag, Wittchen, Höfler, Kessler, & Stein, 2000), marijuana and hashish use (Dembo, et al., 1990), suicidality (Boden, Fergusson, & Horwood, 2006), depression (Stein, et al., 2001), hypertension (Yan, et al., 2003), and coronary heart disease (Kubzansky, Kawachi, Weiss, & Sparrow, 1998). In addition, untreated anxiety symptoms may lead to pathological anxiety disorders (Emilien, Durlach, & Lepola, 2002) which cost the USA about $47 billion per year, 31% of the total expenditures for mental illness care (DuPont, et al., 1996).

Because of this increasing concern about anxiety and its adverse consequences in this population, a number of anxiety-management interventions have been tested. Despite the implementation of theory-based interventions over the past two decades (Kohatsu, 2002), the increase in anxiety prevalence remained steady in this population (American College Health Association, 2000, 2009; Twenge, 2000); which might be an indicator of a theory-practice gap in this field (Griez, Faravelli, & Nutt, 2001). One important cause of this gap was implementing theory-based interventions that were not sufficiently supported by empirical evidence (Hammell & Carpenter, 2004). The lack of a clear understanding of the mechanism of action of some of the proposed and widely used interventions (Shapiro, Carlson, Astin, & Freedman, 2006) and what aspect of anxiety they were designed to target may limit their implementation in practice (Gullotta & Bloom, 2003).

Another possible underlying factor of this gap is the inconsistency in the operational definition of anxiety among these studies. Examples include using instruments that measure the pathological conditions of anxiety, such as the Beck

Anxiety Inventory (Beck & Steer, 1990), as a measure in this non-clinical population (Lam, Michalak, & Swinson, 2005). In addition, the use of other instruments that overlap with depression, such as the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Edward, 1970), may contribute to this confusion in defining anxiety.

The primary aim of this dissertation was to investigate young adult college students' anxiety within three main domains, psychosocial, behavioral, and cognitive. This investigation will allow for (1) identifying the major factors that contribute to anxiety in this population; and (2) developing a theoretical framework for evaluating anxiety in future research.

This chapter is composed of four main sections. First, a discussion on the developmental and psychosocial risk factors of anxiety in young adult college students. Second, the inconsistency of anxiety definitions in the available literature is discussed and an evidence-based operational definition is suggested to be evaluated in this population. In addition, a cognitive-behavioral model of anxiety is presented as a guidance of this dissertation studies. Summary of the Chapters of this dissertation is also included.

Anxiety in Young Adult College Students

Anxiety often occurs during or shortly before the college age (Kessler, Berglund, Demler, et al., 2005) and can be precipitated by several developmental and psychosocial factors. According to the psychosocial development theory, young adult college students' development stage (18 – 24 years) is knotted with the stage of adolescence. The outcome of the identity confusion in this preceding stage can lead to unsuccessful and superficial intimate relationships which in turn may result in isolation, indecision, and intimacy-isolation crisis (Erikson, 1994b). The intimacy versus isolation crisis results if a young adult fails to adapt with the challenges, represented by developing intimate relationships with others, related to his/ her age group.

Failure to develop intimate relationships can be associated with loneliness, isolation, and lack of social support (Cohen & McKay, 1984; Ell, 1984). The social support theory (Cohen, Mermelstein, Kamarck, & Hoberman, 1985) proposes that the social support provided by significant others through advice and reassurance enhances adaptation to stressful situations. Conversely, the lack of social support can aggravate

stress and anxiety. Some researchers who found a negative association between perceived social support and anxiety recommended implementing social-support interventions for anxiety management in college students (Caldwell & Reinhart, 1988; Haemmerlie, Montgomery, & Melchers, 1988). Others have found that anxiety was not significantly related to perceived social support (Eldeleklioglu, 2006). When the effect of other variables, such as age, gender, and coping were controlled, perceived social support was not a significant predictor of anxiety (Crockett, et al., 2007; Davis, Kerr, & Kurpius, 2003) suggesting social support may not be an effective intervention for managing anxiety in this population. These findings indicate that the role of perceived social support in anxiety needs further evaluation.

Young adult college students identity formation can also be affected by certain tasks related to college life such as developing competence, managing emotions, moving through autonomy toward interdependence, developing mature interpersonal relationships, establishing identity, developing purpose, and developing integrity (Chickering & Reisser, 1993). Some college-related tasks, such as academic requirements, financial independency, and establishing interpersonal relationships, were identified as "undergraduates' stressors" (Blackmore, Tucker, & Jones, 2005) that negatively affect psychological and physical wellbeing (Tennant, 2002), and can be associated with depression (Furr, Westefeld, McConnell, & Jenkins, 2001) and anxiety (Blackmore, et al., 2005).

While individuals in this age group (18 – 24 years) are expected to show progress in their individuation and self-definition as exhibited by their capacity to develop mature intimate relationships and maintain independency, the majority tend to postpone accomplishing these tasks (Arnett, 2001b). Particularly, in industrial countries such as the United States, individuals in this age group do not enter adulthood or commit to adulthood roles and responsibilities until after their late teenage years. Thus they are not adults yet, rather they are emerging adults (Arnett, 2004). Throughout their transition to adulthood, they may face difficulties in matching their achievement expectations for education, work, and relationships with real life. In turn, the identity establishment task can be a disorienting and difficult experience for them rather than a normal part of their development (Arnett, 2007).

Failure to accomplish the developmental tasks may result in life dissatisfaction (Schwartz, Coté, & Arnett, 2005). Based on quality of life model of life-satisfaction (Campbell, Converse, & Rodgers, 1976; Erikson, 1994a), Frisch, Cornell, Villanueva, and Retzlaff (1992) proposed that while pleasant emotions stem from the satisfaction accompanying the perception that important needs have been met or fulfilled, anxiety can be associated with low life-satisfaction which may result from the inability to meet needs in valued areas of life. Further, Campbell et al. (1976) outlined certain psychosocial factors that may reduce life satisfaction such as the lack of social support. To our knowledge, there is only one study in which the relationship between life satisfaction and anxiety was investigated in college students. In this study, Parkerson, Broadhead, and Tse (1990), documented that students who had higher levels of life satisfaction, reported lower levels of anxiety. With less clarity about the role of other factors in this relationship, such as age, gender, and social support, it is difficult to suggest whether life satisfaction was directly related to anxiety or indirectly through factors such as coping (Heppner, Cook, Wright, & Johnson, 1995). To address these limitations a comprehensive multidimensional approach was used in this dissertation to develop a perspective on how these psychosocial, behavioral, and cognitive factors can be related to each other and to anxiety.

Bio-Behavioral Mechanism of Anxiety

Anxiety is a multidimensional phenomenon that results from interaction between body, mind and behavior. The hypothalamus-pituitary-adrenal (HPA) axis provides a regulatory feedback network between the brain and the body's behavioral and physiologic responses to stressors. In response to a stressful situation, the cerebral cortex evaluates the perceived information regarding the situation and provides cognitive interpretation whether this situation is a threat or not. The cortex then sends messages to the hypothalamus which integrates this cognitive message with emotional content from the limbic system (amygdale, Hippocampus, hypothalamus). If the situation is interpreted as a threat, a specific part in the hypothalamus, the amygdale, releases the corticotropin-releasing hormone (CRH) which travels through the portal vessels to the anterior pituitary gland where it stimulates the release of the adrenocorticotropic hormone (ACTH). This hormone circulates in the blood stream and targets zona fasiculata and reticularis cells in

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the adrenal cortex where the biosynthesis and secretion of the cortisol is activated (Leyden-Rubenstein, 1999).

Cortisol has receptors in almost all body tissue. It enhances gluconeogenesis and carbohydrates glycolysis in the liver, lypolysis in the fat tissues, and protolysis in the muscle tissues. In addition, it affects the immune system causing immunosupression and the circulatory system causing fluid and electrolyte retention, hypervolemia, and hypertension. This may explain certain physical conditions and symptoms such as hyperglycemia, infection, hypertension, tachycardia, flushing, and headache usually associated with anxiety (Anderson, et al., 2002; Fogarty, Engel Jr, Russo, Simon, & Katon, 1994; Newport & Nemeroff, 2000). Further, in chronic anxiety, cortisol continues to circulate. The association of this continuous circulation with certain conditions such as the high level of circulated fatty acids, as lypolysis products, increases the risk for atherosclerosis. Chronic increases in heart rate, blood pressure, and atherosclerosis may lead to coronary heart disease (Leyden-Rubenstein, 1999), a clinical condition which has been shown in several studies to be associated with chronic anxiety (Albert, Chae, Rexrode, Manson, & Kawachi, 2005; Kawachi, Colditz, et al., 1994; Kubzansky, et al., 1998).

Recent research has indicated that patients with anxiety disorders often present dysregulation of the HPA axis, which is reflected in elevation in certain biomarkers. For example, it is documented that patients with PTSD display a significantly elevated cerebrospinal fluids CRH concentrations (Bremner, et al., 1997) while patients with generalized anxiety disorder exhibit a significant elevation in plasma ACTH levels (Zambellia, Realib, & Brambillac, 2000) and a sustained elevation of plasma cortisol levels, with a blunted circadian curve (Tafet, Feder, Abulafia, & Roffman, 2005). Further, significant elevation of the salivary cotisol level has been noted in individuals with high levels of dental anxiety (Benjamins, Asscheman, & Schuurs, 1992), panic disorder (Garcia-Leal, et al., 2005), and generalized anxiety disorder (Mantella, et al., 2008).

Based on the physiological interrelation between anxiety and HPA axis activity, plasma and salivary cortisol can be used as biomarkers of anxiety (Buchanan, al'Absi, & Lovallo, 1999; Melamed, et al., 1999). Since free cortisol represents the biologically

active hormone fraction, salivary cortisol measure is considered a better reflection of adrenal cortical activation than plasma cortisol (Vining, McGinley, Maksvytis, & Ho, 1983). In addition, salivary cortisol correlates better with plasma ACTH than plasma cortisol and thus it is considered a more accurate and valid indicator of the secretory activity in the HPA axis (Aardal-Eriksson, Karlberg, & Holm, 1998; Ryoji, 1981). Thus, salivary cortisol is considered as a valid and reliable measure of anxiety. However, due to certain limitations in time and resources, this dissertation used only subjective measure of anxiety.

Operational Definition of Anxiety

One of the identified barriers for interpreting research findings is the inconsistency in defining and measuring anxiety in young adult college students. Most of the researchers defined and measured anxiety based on the state-trait theory (Spielberger et al., 1970). According to this theory, the state-anxiety is defined as "a palpable but transitory emotional state or condition characterized by feelings of tension and apprehension and heightened autonomic nervous activity" (Spielberger, 1972, p24), while trait-anxiety is an individual's predisposition to respond to stress and is congruent with the conception of chronic anxiety. According to this theory, a person with a high trait-anxiety level tends to perceive a higher number of situations as threatening and concurrently has a higher level of state-anxiety than one with a low trait-anxiety level. Based on this conceptual definition, the State-Trait Anxiety Inventory (STAI) Form X and Y were developed (Spielberger et al., 1970). However, several researchers have indicated that the State-Trait Anxiety Inventory overlaps with other instruments that measure depression such as the Beck Depression Inventory (Bieling, Antony, & Swinson, 1998; Caci, Baylé, Dossios, Robert, & Boyer, 2003; Endler, Cox, Parker, & Bagby, 1992; Gros, Antony, Simms, & McCabe, 2007). A recent psychometric study by Gros et al. (2007) indicated that the STAI was more strongly correlated with instrument that measured depression than with the one that measured anxiety. This overlap led investigators to question whether anxiety and depression are distinctive phenomenon.

Taking into account that this overlap mainly exists between the trait/chronic form of anxiety along with the empirical evidence that anxiety in its chronic stages may lead to mood disorders such as depression (Stein et al., 2001), it can be concluded that this

overlap might be related to the co-morbidity of these two conditions. Particularly among adolescents and young adults empirical evidence indicated that anxiety and depression frequently coexist (Angst, Vollrath, Merikangas, & Ernst, 1990; PC Kendall, Kortlander, Chansky, & Brady, 1992). Yet, most researchers who investigated anxiety and anxiety management interventions in this population used the STAI as the measure of anxiety (e.g. Eldeleklioglu, 2006; Endler, Kantor, & Parker, 1994; Hirai & Clum, 2005; Jain, et al., 2007; Kassel, Bornovalova, & Mehta, 2007; Shapiro, Schwartz, & Bonner, 1998). Accordingly, for the purpose of this dissertation the tripartite model which clearly defined and distinguished between these two constructs was used (Clark & Watson, 1991).

Based on an extensive review of the literature, Clark and Watson (1991) noted that although anxiety and depression are both characterized by distress and unpleasant mood symptoms, they are distinct constructs. They proposed the tripartite model of depression and anxiety. According to this model, anxiety can be distinguished from depression by the presence of physiological hyperarousal symptoms. On the other hand, depression can be distinguished from anxiety by the presence of low positive affect symptoms such as decreased arousal, energy, and activity.

Based on this model, Lovibond and Lovibond (1995) developed the Depression, Anxiety, and Stress Scale (DASS) and an abbreviated version, the DASS-21. Throughout the development process of the DASS, Lovibond and Lovibond (1995) noticed that items related to low positive affect, low self-esteem, hopelessness, and lack of incentives loaded on one factor and were categorized as depression while items related to autonomic arousal and fearfulness were categorized as anxiety. There was a group of items, related to tension, irritability, and over reactivity, which neither loaded on depression nor on anxiety; thus, it was categorized as stress. Although the DASS-21 dimensionality, reliability, and validity have been demonstrated in previous psychometric studies (Antony, Bieling, Cox, Enns, & Swinson, 1998), to date, these psychometric properties have not been demonstrated in young adults. In this dissertation, the dimensionality of the DASS-21 was examined and evidence for internal consistency reliability and construct validity in a sample of young adult college students was provided.

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Cognitive-Behavioral Model of Anxiety

Anxiety is not directly caused by stressors. Rather, it is an individual's reaction to the perception of stressors. Stressors are physical, emotional, or social stimuli that an individual face in daily life and may produce feeling of tension and strain (McKenzie, Pinger, & Kotecki, 2008). According to Beck and Clark's information processing model of anxiety (Beck & Clark, 1997), negative interpretation of stressful situations activates the primal cognitive mode, a subconscious psychological scheme concerned with the organism survival (i.e. fight-flight response), which may lead to maladaptive coping behaviors. On the other hand, a positive perception of a stressful situation promotes constructive thinking which is strategic elaborative thinking that provides the opportunity for more reality-based reappraisal of the stressful situation and leads to adaptive coping behavior such as problem solving.

The transactional model of coping (Lazarus & Folkman, 1996) differentiated between two main stress-coping mechanisms, adaptive and maladaptive. Through these two mechanisms an individual displays certain behaviors that are thought to moderate the effect of stressful stimuli. Adaptive coping behaviors involve defining the stressful situation, actively seeking support, reflecting on possible solutions, and taking actions to resolve the situation. Such actions resolve the stressful situation and result in psychological/ emotional adjustment. Conversely, maladaptive coping behaviors include efforts to withdraw from the stressful situation or avoid seeking solutions which may result in failure to resolve the stressful situation and can be associated with anxiety (Figure 1). Researchers have shown that negative thinking predicts maladaptive coping behaviors (Moulds, Kandris, Starr, & Wong, 2007; Seiffge-Krenke & Klessinger, 2000). In addition, maladaptive coping behaviors, such as avoidance and denial, were found to predict the anxiety level of young adult college students (Blalock & Joiner, 2000; Heppner, et al., 1995). However, the sequential relationships between negative thinking, maladaptive coping, and anxiety have not been investigated. To examine this relationship in this dissertation studies, these constructs were operationally defined as follow. Negative thinking was measured using the Cognition Checklist-Anxiety which includes items related to thoughts about personal, physical, and psychological threat or danger situation. Positive thinking was operationally defined using Positive Automatic Thoughts

Questionnaire which includes items assessing positive self-statements and thoughts. Coping was defined within two main domains, adaptive and maladaptive, using the Brief COPE Inventory. Adaptive coping include active coping, planning, positive reframing, acceptance, humor, and seeking emotional and social support. The maladaptive coping, on the other hand, include denial, venting, substance use, self-blaming, and behavioral disengagement (giving up the attempt to cope).

In sum, young adult college students face developmental, psychosocial, and academic challenges that increase their risk of anxiety. There are two main gaps in the related literature, using a unidimensional theoretical models and inconsistent operational definitions of anxiety. This dissertation has three specific purposes: 1) examine the psychometric properties of the DASS-21 for measuring anxiety and other commonly co-morbid constructs such as depression and stress in young adult college students, 2) determine the relative importance of coping style, categorized as adaptive and maladaptive, life-satisfaction, and selected demographics in predicting young adult college students' anxiety, and 3) examine a proposed model of the relationships among coping style (adaptive and maladaptive), and thinking style (positive and negative), life satisfaction, social support, and selected demographics and anxiety in young adult college students.

Summary of Chapters

Chapter Two is a report of the investigation of DASS-21 psychometric properties. A total of 508 undergraduate students aged 18-24 years completed mailed surveys that included the DASS-21. Coping strategies and life satisfaction were assessed using the Brief COPE Inventory, and an adapted version of the Brief Students' Multidimensional Life Satisfaction Scale. Exploratory factor analysis was used to investigate the dimensionality of the DASS-21. Evidence for construct validity was based on the transactional model of coping and the quality of life model of life satisfaction. Reliability was examined using Cronbach's coefficient alpha. Findings supported the reliability, construct validity, and the 3-factor dimensionality of the DASS-21 which suggested that the DASS-21 is a appropriate instrument for distinguishing between depression and anxiety in young adult college students.

In Chapter Three we examined the relative importance of coping style (adaptive or maladaptive), life satisfaction, and selected demographics in predicting undergraduate students' depression, anxiety, and stress. A total of 508 undergraduate students aged 18-24 years completed mailed surveys that included the study measures and a short demographics information questionnaire. Coping strategies and life satisfaction were assessed using the Brief COPE Inventory, and an adapted version of the Brief Students' Multidimensional Life Satisfaction Scale. Depression, anxiety, and stress were measured using the DASS-21. Multiple regression analyses were used to examine the relative influence of each of the independent variables on the depression, anxiety, and stress. Findings indicated that maladaptive coping was the main predictor of depression, anxiety and stress. Adaptive coping was not a significant predictor of any of the three outcome variables. These findings suggest that evaluating and targeting students' maladaptive coping behaviors may promote their psychological well-being.

Chapter Four is a report of the test of an integrated multidimensional model of anxiety that included psychosocial, behavioral, and cognitive propositions derived from theories. Using the path analysis method, a hypothetical model of the relationship among coping style (adaptive and maladaptive), and thinking style (positive and negative), life satisfaction, and selected demographics and anxiety was tested. A total of 257 undergraduate students aged 18-24 completed online survey that included the study measures and a short demographics information questionnaire. The independent variables in the model were measured using the Multidimensional Scale of Perceived Social Support, an adapted version of the Brief Students' Multidimensional Life Satisfaction Scale, the Brief COPE Inventory, the Positive Automatic Thoughts Questionnaire, and the Cognition Checklist-Anxiety. Anxiety was measured using the Anxiety subscale in the DASS-21. Series of seven-multiple regressions were run. In the first regression, the outcome variable, anxiety, was regressed on the selected demographics, social support, life satisfaction, adaptive coping, maladaptive coping, positive thinking, and negative thinking. In subsequent regression procedures, each variable in the model was regressed on the preceding variables. The final model indicated that only negative thinking and maladaptive coping had a direct relationship with anxiety. Negative thinking was the main predictor of both maladaptive coping and anxiety. These findings suggest that

helping undergraduates manage their anxiety can be achieved through designing interventions that may decrease negative thinking. Future research is recommended for testing the causal relationship between negative thinking and anxiety proposed in this model.

Chapter Five is a synthesis of the results of the preceding chapters and a discussion of how this body of work advances the state of the science regarding anxiety in young adult college students. Implications for practice and research are also discussed.

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Figure 1.1: Integrative Model for Studying Anxiety

Stressful Situations

Positive Interpretation
(Positive Thinking)

Negative Interpretation
(Negative Thinking)

Constructive Thinking

Primal Mode Activation

Adaptive Coping
(E.g. problem solving)

Maladaptive Coping
(E.g. avoidance)

Anxiety
(Physiological hyperarousal)

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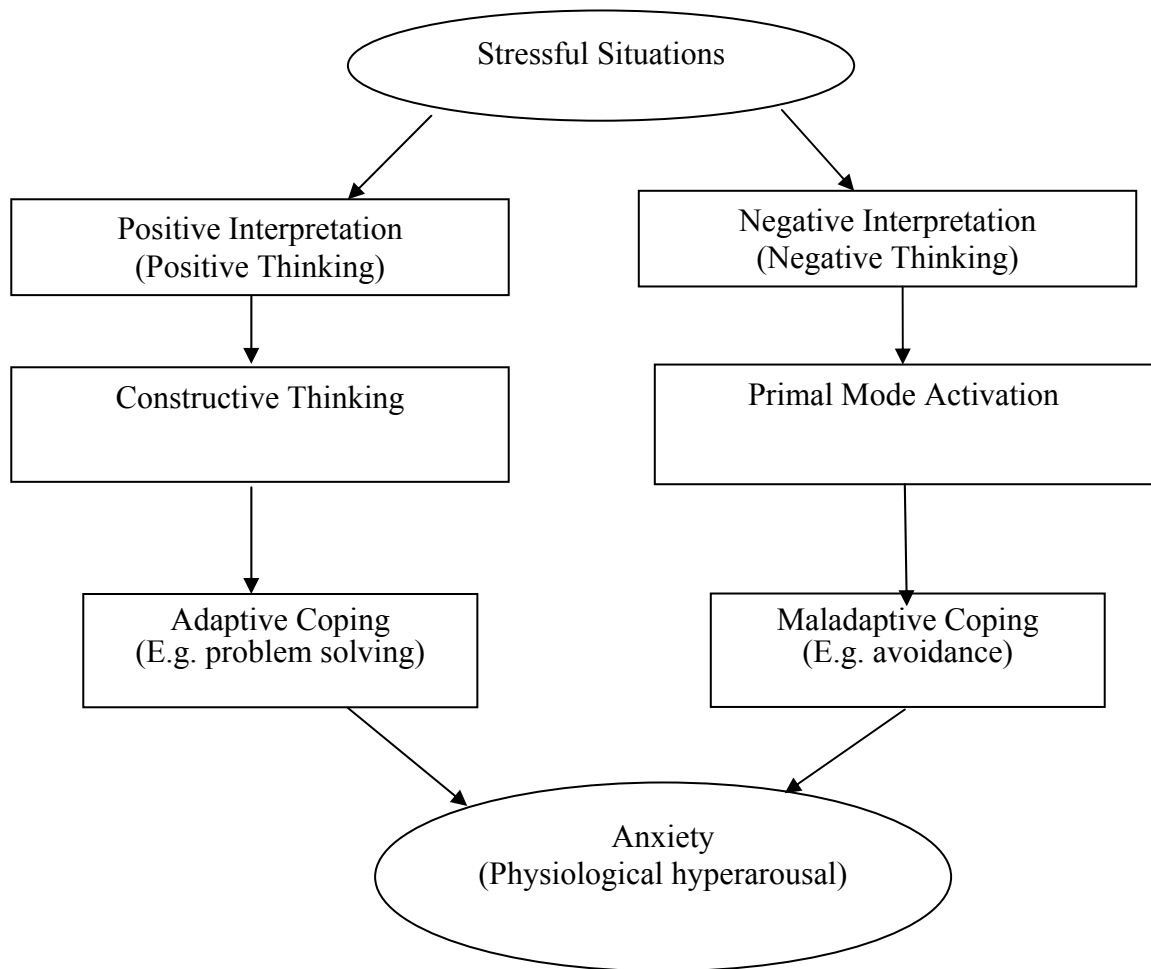
CHAPTER TWO

The Psychometric Properties of the 21-Item Depression Anxiety and Stress Scale (DASS-21) among a Sample of Young Adults

Introduction

This paper aims to examine the reliability and validity of the 21-item shortened version of the Depression Anxiety and Stress Scale (DASS-21) (Lovibond & Lovibond, 1995) in college students. The DASS-21 is a self-report 4-point Likert-type measure of three dimensions of mental health: depression, anxiety, and stress. The 42-item DASS was developed to better distinguish between depression and anxiety than previous scales had done, scales that produced considerable overlap between these two constructs (Lovibond & Lovibond, 1995).

The development of the DASS was based on the tripartite model of depression and anxiety (Clark & Watson, 1991). Items related to low positive affect, low self-esteem, hopelessness, and lack of incentives loaded on one factor and were categorized as depression while items related to autonomic arousal and fearfulness were categorized as anxiety. Nonetheless, there was a group of items which neither loaded on depression nor on anxiety, but loaded on a third factor of irritability and over reactivity. This 3-dimensional property of the DASS has been confirmed in several studies (Anthony & O'Brien, 2002, Lovibond & Lovibond, 1995; Antony, Bieling, Cox, Enns, & Swinson, 1998; Crawford & Henry, 2003).

Items included in the DASS-21 were selected by the authors to represent all subscales (Lovibond & Lovibond, 1995); however, the use of factor analysis to investigate the scale's dimensionality was not found. When the psychometric properties of the DASS-21 were evaluated in clinical and nonclinical samples, acceptable alpha reliabilities for the DASS–21 subscales were reported (Antony, et al., 1998); however, the exploratory factor analysis conducted in that study involved only the clinical sample.

Even though the DASS-21 has been widely used for measuring depression, anxiety, and stress among non-clinical populations, to date there is only one study that examined its dimensionality and construct validity among a non-clinical population (Henry & Crawford, 2005). In this study, the 3-dimensional nature of the DASS-21was supported using a confirmatory factor analysis (CFA); however, it was conducted on a

heterogeneous community sample aged 18 to 91 years ($M = 41 + 15.9$). Considering the fact that age is one of the important factors that may be associated with an increase or decrease in certain psychological symptoms such as depression (Brim, Ryff, & Kessler, 2004) and that this study did not display whether the 3-dimensional factor structure was consistent across the different age groups, it is essential to further examine the dimensionality and construct validity of the DASS-21 among an age-homogenous non-clinical sample.

A recent study examining the dimensionality of the DASS-21 in young adolescents and children indicated that this instrument is unidimensional and questioned its ability to distinguish between depression, anxiety, and stress (Patrick, Dyck, & Bramston, 2010). They concluded that the psychological distress symptoms, included in this measure, cannot be categorized into three distinctive constructs in this age group. They proposed that the three-dimensional structure of these symptoms emerge in late adolescence and cannot be identified until adulthood. Since young college students (age 18 – 24 years) are in a transitional developmental stage between adolescence and adulthood (Arnett, 1994, 2000, 2001b), it is important to investigate the structure of these symptoms among them.

The specific aims of this study were to: investigate the dimensionality of the DASS-21, examine its internal consistency, and evaluate its construct validity in a sample of young adults. One recommended method for assessing the construct validity of an instrument is examining the correlation of the measure being evaluated with variables that are assumed to be theoretically related to the constructs measured by the instrument (DeVellis, 2003). According to the transactional model of coping (TMC) (Lazarus & Folkman, 1984), adaptive coping refers to the effectiveness of coping in improving the adaptation outcome. Thus, adaptive coping behavior is seen as a buffer which neutralizes the impact of a stressful situation and promotes psychological well-being and functional status. Conversely, maladaptive coping is failing to resolve the stressful situation successfully and may result in psychological distress symptoms such as depression, anxiety, and stress.

According to the quality of life (QOL) model of life satisfaction (Campbell, et al., 1976), individuals' overall life satisfaction consists of the sum of satisfactions in

particular domains or areas of life that are valued as important by an individual. Positive affect and pleasant emotions stem from satisfaction with met or fulfilled needs while negative affect results from unmet needs in valued areas of life (Frisch, et al., 1992). Based on these two models, three hypotheses were generated to test construct validity.

1. Depression, anxiety, and stress, as measured by the DASS-21, are associated with maladaptive coping.
2. Depression, anxiety, and stress, as measured by the DASS-21, are negatively associated with adaptive coping.
3. Depression, anxiety, and stress, as measured by the DASS-21, are negatively associated with life satisfaction.

Method

Design and Sample

This is a secondary analysis of cross-sectional data collected in 2007 to evaluate the general well-being of University of Kentucky college students (See Appendix A for complete questionnaire). After Institutional Review Board approval and with the assistance of the Office of the Registrar, a sample of 1,700 full-time undergraduate students, ages 18-24 years, was randomly selected. Students were passively consented by cover letter which was mailed to them with the questionnaire, a two-dollar bill incentive, and a stamped and addressed return envelope. Acknowledgment postcards were sent to students who responded and follow-up reminder ones were sent to those who did not respond to the initial survey mailing one week later. Finally, a second survey package was sent to those who had not yet responded within a three-week period. Out of the 1,700 mailed questionnaires, 109 were undeliverable. The response rate was 32% ($N = 511$); of these, three respondents identified themselves as graduate students and were excluded from the data analysis.

Instruments

Depression, Anxiety & Stress Scale (DASS-21) (Lovibond & Lovibond, 1995). DASS-21 is a short form of DASS which is a self-report 4-point Likert scale and composed of three subscales: Depression (DASS-D), Anxiety (DASS-A), and Stress (DASS-S). The DASS-21 measures each of the three mental health conditions, over the

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past week, through seven items. Responses on each item range from 0 (*did not apply to me at all*) to 3 (*applied to me very much*). The intensity of any of the three conditions is determined by the sum scores of responses to its 7-item subscale. The alpha reliability coefficients for the DASS–21 subscales have been examined in clinical and nonclinical samples and reported as .94 for DASS-D, .87 for DASS-A, and .91 for DASS-S (Antony, et al., 1998).

Brief COPE Inventory (BCI) (Carver, 1997). BCI is the abbreviated version of the original 60-item COPE Inventory (Carver, Scheier, & Weintraub, 1989). It is a 28-item self-report 4-point Likert-scale instrument containing 14 2-item scales, which are categorized as adaptive and maladaptive. Responses on each item range from 0 (*I usually don't do this at all*) to 3 (*I usually do this a lot*). Coping is the sum of the 28 items ranging from 0 – 84; adaptive coping is the sum of 16 items ranging from 0 – 48, and maladaptive coping is the sum of 12 items ranging from 0 – 36. Higher scores on either scale indicate more frequent use of that coping style. Both the adaptive and maladaptive scales had good internal consistency with Cronbach's alphas of .88 and .81, respectively, in this sample.

The Brief Students' Multidimensional Life Satisfaction Scale (BSMLSS) (Huebner, 1994). The BSMLSS is a 40-item self-report instrument that measure satisfaction with different aspects of life. Responses on each item range from 1 (*terrible*) to 7 (*delighted*). For the purpose of this study, eleven items were selected to represent different aspects of life satisfaction. The Cronbach's alpha of this 11-item shortened scale was .85 in this sample. Life satisfaction is the sum of 11 items ranging from 1 – 77. The higher the score on this scale the greater the life satisfaction.

Procedure

Statistical analyses were conducted using the SPSS (version 11.0, SPSS Inc, Chicago, Ill). The data set was first checked for the assumptions of regression analysis using the residual scatter plot and the normal probability plot. Scores of depression and anxiety were found to be positively skewed (*skew* = 1.65, 2, respectively); however, having a large enough sample size ($N = 508$) and more than 10 observations for each predictor make the regression robust to departures from normality (Pallant, 2004).

Tolerance values were found to be greater than .10, while VIF values were smaller than 10. Thus, no problem of multicollinearity was found to exist.

In the first phase of analysis, descriptive statistics were used to characterize the demographics of the sample and the distribution of the three mental health factors among students. To examine the factor structure of the DASS-21, an oblique (oblimin) rotation was chosen to account for the fact that the three separable structures of the DASS-21 are moderately correlated (Norman & Streiner, 2008). Internal consistency reliabilities for the DASS-21, BCI, and the adapted 11-item BSMLSS were examined using Cronbach's alpha. In order to test the three hypotheses related to the construct validity of the DASS-21, three separate multiple regressions were run to evaluate the ability of adaptive coping, maladaptive coping to predict each of the three mental health factors, depression, anxiety, and stress. Alpha was set at $P < .05$.

Results

Sample Description

The students' demographic characteristics are displayed in Table 1. The total number of undergraduates who participated in this study was 508, of these, 355 (66%) were female. Students' mean age was 20 ($SD = 1.6$), and their mean GPA was 3.2 ($SD = .60$). Female and male students were similar in their mean age, class standing, residency, ethnicity, parents' marital status, and religious self-identification (religious or not). On the other hand, female students were more likely to belong to a social organization and have higher academic performance, as measured by GPA, than males. In addition, female students scored higher on anxiety and stress subscales and used coping strategies, both adaptive and maladaptive, more frequently than males. Female and male students reported similar levels of depression and satisfaction (see Table 2). With regard to students' scoring on the DASS-21 subscales, 29% of the students were depressed, 27% were anxious, and 24% were stressed.

Dimensionality, Internal Consistency, and Construct Validity of the DASS-21

Dimensionality. Principal components analysis was conducted to investigate the dimensionality of the DASS-21. The number of factors to be retained and rotated was determined by examining the magnitude of the Eigenvalues and inspecting the scree plot.

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Only factors before the drop-off point were retained (Cattell, 1978). Since the three subscales are moderately intercorrelated (Lovibond & Lovibond, Antony, et al., 1998; 1995), which was supported by evidence from the current study (r = .75 to .76), oblique rotation (oblimin) was applied to obtain the final factor solution. This technique was chosen because it allows for intercorrelation among the factors thereby minimizing the number of cross-loading items and maximizing the number of the extracted factors which have as many primary loadings as possible (Bandalos & Boehm-Kaufman, 2008). The item-contribution to a certain factor was determined by a factor loading equal to or greater than .40 on that factor.

Three factors had Eigenvalues greater than 1 (10, 1.3, 1.2) accounting for 60% of the variance. The application of the oblimin rotation to the first three principal components produced the factor structure reported in Table 3. Loading for all items were .40 in magnitude or greater. A few items displayed a different loading pattern from that of the DASS (Lovibond & Lovibond, 1995). For example, item # 14, (*I was intolerant of anything that kept me from getting on with what I was doing*) and item #18, (*I felt that I was rather touchy*), which were categorized in as related to stress (Lovibond & Lovibond, 1995), had clear loadings on the depression factor. In addition, item # 15, (*I felt I was close to panic*), an anxiety item in the DASS, had a clear loading on the depression factor. On the other hand, there were two items related to autonomic arousal and fearfulness, classified in the DASS as related to anxiety, item # 2, (*I was aware of dryness of my mouth*), and item # 9, (*I was worried about situations in which I might panic and make a fool of myself*), that had clear loadings on the stress factor. Item # 8, (*I felt that I was using a lot of nervous energy*), a stress item in DASS, double loaded on stress and anxiety.

Internal consistency. Cronbach's alpha was computed for each of the three subscales before and after factor analysis, where only items with primary loadings were included. The reliability of the items forming each dimension remained nearly the same. Cronbach's alphas before the factor analysis were .90 for Depression, .83 for Anxiety, .86 for Stress. After factor analysis, the alpha remained the same for the Depression and decreased by .03 and .04 for Anxiety and Stress, respectively. Thus, no modification in the items categorization was suggested.

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Construct validity. To test the three hypotheses related to the construct validity of the DASS-21, separate multiple regression models were run for the DASS-21 total and subscales scores. The aim of each model was to examine the ability of maladaptive coping, adaptive coping, and satisfaction to predict each of these three mental health factors and the DASS-21 total score. The standardized regression coefficient, Beta (*β*), was used to determine the strength and direction of the association (see Table 4).

Findings support the first hypothesis; maladaptive coping predicted depression, anxiety, and stress. For the second hypothesis, adaptive coping only predicted depression. The third hypothesis was supported; life satisfaction predicted all the three constructs.

Discussion and Conclusion

This study is the first to run an EFA for the DASS-21 in a non-clinical young adult sample. The findings supported the 3-dimensional structure of this scale which was outlined in previous CFA study (Henry & Crawford, 2005). Further, the factor pattern was almost consistent with that of the DASS (Lovibond & Lovibond, 1995) and supported the theoretical perspective of the tripartite model (Clark & Watson, 1991) with regard to how anxiety and depression were distinguished from each other. In the present sample, depression was defined by items related to low positive affect, low self-esteem, hopelessness, and lack of incentives while anxiety was mainly defined by those related to autonomic arousal. Stress was defined by difficulty relaxing, irritability, and over reactivity.

Consistent with findings from similar studies among adults (Antony, et al., 1998) and elderly (Gloster, et al., 2008), our findings indicated that the psychological symptoms measured by the DASS-21 can be distinguished into three main constructs in young adult college students, depression, anxiety, and stress. The high correlations and coexistence of depression, anxiety, and stress in this population shouldn't be misinterpreted as an indicator of their unitary structure (Kendall & Watson, 1989). Rather it highlights the importance of evaluating these symptoms simultaneously but distinctively.

The findings supported the theoretical relationships between the three main constructs measured by the DASS-21 and coping proposed in the TMC model (Lazarus & Folkman, 1984). Depression, anxiety, and stress were associated with maladaptive coping. In addition, the current findings are consistent with the QOL model of life

satisfaction (Campbell, et al., 1976); the higher the life satisfaction, the lower the scores on the three DASS-21 subscales. These results supported the validity of the DASS-21 and the findings of previous validation studies (Antony, et al., 1998; Henry & Crawford, 2005). In conclusion, this study provides support for the reliability and validity of the DASS-21 as a measure for distinguishing among the three constructs of depression, anxiety, and stress in young adult college students.

Table 2.1: Sample Demographics by Gender

Characteristics/ Categories	Total sample (N = 457)		Male (n = 156)		Female (n = 301)		P
	n	(%)	N	(%)	n	(%)	
Class Standing							
Freshman	111	(24)	33	(21)	78	(26)	NS
Sophomore	94	(21)	32	(20)	62	(21)	
Junior	111	(24)	37	(24)	74	(25)	
Senior	141	(31)	54	(35)	87	(29)	
Residency							
On campus	164	(36)	49	(31)	115	(38)	NS
Off campus	293	(64)	107	(69)	186	(62)	
Living with someone	401	(88)	137	(88)	264	(88)	
Living alone	56	(12)	19	(12)	37	(12)	
Religious self-identification							
Religious	355	(78)	177	(75)	238	(80)	NS
Not religious	102	(22)	39	(25)	63	(20)	
Ethnicity							
Caucasian	412	(91)	138	(90)	274	(91)	NS
Other	42	(9)	16	(10)	26	(9)	
Belong to social organization							
Yes	98	(21)	19	(12)	79	(26)	< .01
No	358	(79)	137	(88)	221	(74)	

Table 2.2: Mean and Standard Deviations of Mental Health Factors, Coping, and Life Satisfaction by Gender

Categories	Total sample (N = 457		Male (n = 156)		Female (n = 301)		P
	M	SD	M	SD	M	SD	
Mental health factor							
Depression	7.70	8.10	6.71	8.26	8.27	9.00	NS
Anxiety	5.15	6.69	3.94	5.93	5.81	7.00	< .01
Stress	10.42	8.90	8.44	8.12	11.55	9.00	< .0001
Coping	32.35	12.65	28.72	13.39	34.25	13.39	< .0001
Adaptive	22.89	9.27	20.74	10.00	24.00	8.70	< .001
Maladaptive	9.47	5.50	8.00	5.20	10.25	5.52	< .0001
Life-satisfaction	54.70	9.60	54.21	10.00	54.83	9.51	NS

Table 2.3: Factor Pattern Matrix for the Oblique Rotation of Three Factors for the DASS-21(*N* =508)

Items (Original subscale)[a]	Factor [b]		
	I	II	III
21. I felt that life was meaningless (D).	**.89**	- .17	.07
17. I felt I wasn't worth much as a person (D).	**.86**	- .10	.09
16. I was unable to become enthusiastic about anything (D).	**.78**	.00	.11
10. I felt that I had nothing to look forward to (D).	**.77**	.05	.08
13. I felt down-hearted and blue (D).	**.73**	.27	- .13
18. I felt that I was rather touchy (S).	**.50**	.14	.07
5. I found it difficult to work up the initiative to do things (D).	**.54**	.29	- .09
3. I couldn't seem to experience any positive feeling at all (D).	**.53**	.13	.23
14. I was intolerant of anything that kept me from getting on with what I was doing (S).	**.42**	.37	- .01
15. I felt I was close to panic (A).	**.40**	.16	.36
1. I found it hard to unwind (S).	- .06	**.80**	- .03
12. I found it difficult to relax (S).	.18	**.73**	- .04
11. I found myself getting agitated (S).	.17	**.70**	.00
8. I felt that I was using a lot of nervous energy (S).	- .12	**.60**	**.41**
9. I was worried about situations in which I might panic and make a fool of myself (A).	.06	**.57**	.16
2. I was aware of dryness of my mouth (A).	.05	**.47**	.14
6. I tended to over-react to situations (S).	.30	**.41**	.08
19. I was aware of the action of my heart in the absence of physical exertion (A).	.06	.01	**.74**
20. I felt scared without any good reason (A).	.20	- .09	**.73**
4. I experienced breathing difficulty (A).	00	.11	**.72**
7. I experienced trembling (A).	.01	.07	**.70**

[a] DASS-21subscales: D = Depression, A = Anxiety, S = Stress.

[b] Factor I = Depression, Factor II = Stress, and Factor III = Anxiety.

Note: loadings ≥ .40 are in boldface type.

Table 2.4: Standardized Regression Coefficients Describing Relationships of Adaptive Coping, Maladaptive Coping, and Life Satisfaction with the DASS-21 and its Subscales (N =508)

Outcome	Predictors in the Model		
	Maladaptive Coping	Adaptive Coping	Life Satisfaction
DASS-21 Total Score	.58***	- .05	- .29***
Depression	.56***	- .12**	- .35***
Anxiety	.54***	- .04	- .18***
Stress	.54***	.03	- .23***

** $P < .01$, *** $P < .0001$

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CHAPTER THREE

**The Role of Maladaptive Coping in Predicting Young Adult College Students'
Depression, Anxiety, and Stress**

Introduction

Approximately 40 million American adults suffer from an anxiety disorder and 75
% of them experience their first episode of anxiety by age 22 (Anxiety Disorder
Association of America, 2010). Unmanaged anxiety may contribute to heart disease, the
leading cause of death in the United States (Centers for Disease Control and Prevention,
2010), substances abuse (Yapko, 1992), and depression (Kessler, Berglund, Borges,
Nock, & Wang, 2005). The rate of college students diagnosed with depression increased
from 10 % in 2000 to 15 % in 2006 (American College Health Association [ACHA],
2008). Depression may lead to suicide, the second-leading cause of death among college
students that results in 1,100 lives lost each year (Floyd, Mimms, & Yelding, 2007).

According to Blazer, Kessler, McGonangle, and Swartz (1994), the most likely
age group to have major depression includes individuals between the ages of 15 and 24
years, the predominate age of traditional undergraduates. Implementing strategies that
may enhance undergraduates' mental well-being requires a clear understanding of how
certain mental health factors are related to undergraduates' psychosocial and behavioral
characteristics. Thus, this paper aims to investigate the main predictors of three mental
health factors, depression, anxiety, and stress, in undergraduates and determine their
relative contribution to each of these three factors.

From a developmental perspective, undergraduates' age group has been described
as emerging adulthood which is a transitional developmental stage between late
adolescence and adulthood (Arnett, 2004). In this stage, individuals are expected to show
progress in their individuation and self-definition as exhibited by their capacity to be
independent in the decisions they make and follow through in a mature manner (Arnett,
2001b). Arnett (2004) further documented that most emerging adults go through the
"quarterlife crisis", a phenomenon common among individuals in their twenties
associated with their transition to adulthood and characterized by identity confusion,
insecurity regarding the future, and frustration with interpersonal relationships.

This transition, which requires developing skills for maintaining the independence and self-sufficiency an individual gains through adolescence and for managing new tasks with regard to developing and maintaining intimate relationships, is considered stress-arousing and anxiety-provoking among undergraduates (Zirkel, 1992; Zirkel & Cantor, 1990). Failure to accomplish the transition-related tasks such as employment and developing interpersonal relationships has been found to be associated with depression (Galambos, Barker, & Krahn, 2006; Waelde, Silvern, & Hodges, 1994).

The life roles change associated with this transition has been explained, in relation to undergraduates' life-satisfaction and mental health, differently. Some explanations were established on the role-strain perspective which assumes that expansion of the number and types of role demands may result in a more stressful life and less life-satisfaction (Barnett & Baruch, 1985). In contrast, Bailey and Miller (1998) found that college students with more demanding life-styles had higher life-satisfaction and less stress.

Undergraduates' age-group vulnerability to anxiety is frequently interpreted based on the coping theory of Heppner et al. (1995) who documented that undergraduates' stress-coping style is correlated with their psychological distress symptoms in a predicted manner such that the more frequently they utilize suppression and avoidance coping strategies, the higher they score on depression, anxiety, and psychological maladjustment measures. Even though some studies show that individuals progress in their utilization of the adaptive coping across their life span, several studies have indicated that adolescents and young adults used more maladaptive coping strategies, such as escape-avoidance, as compared to other age groups (Fredda Blanchard-Fields, Sulsky, & Robinson-Whelen, 1991; Irion & Blanchard-Fields, 1987).

Further, there are inconsistencies in the literature with regard to how gender, mental health factors, and selected coping-style are related to each others. Even though gender differences in anxiety among undergraduates has constantly been reported in the literature with the females scoring higher on anxiety self-reported measures than the males (Chapell, et al., 2005; Howley & Dickerson, 2003; Misra & McKean, 2000a; Oliver, Reed, & Smith, 1998), findings with regard to the gender differences on depression are inconsistent. While Stangler and Printz (1980) and Hankin, et al (1998)

found that female undergraduates had higher rates of depression than the males, Grant et al. (2002) reported that males were more likely to be depressed, and Gladstone and Koenig (1994) found an equivalent rate between the two genders.

When higher psychological distress symptoms among females are detected, it is frequently interpreted as related to their more frequent utilization of emotion-focused coping strategies and less utilization of problem-focused coping than males (Garnefski, Teerds, Kraaij, Legerstee, & van den Kommer, 2004; Hänninen & Aro, 1996; Vingerhoets & Van Heck, 1990). However, this interpretation is not constantly supported by research findings. For example, Ptacek, Smith, and Zanas (1992) found that even though male undergraduates reported using problem-focused coping strategies more frequently than females, both males and females used problem-focused coping strategies with greater relative frequency than any other category of coping. On the other hand, Sigmon, Stanton, and Snyder (1995), who found an association between emotion-focused coping strategies and psychological distress symptoms among undergraduates, documented that there was no gender differences in the type of coping strategies used in response to stressful life situations. Nevertheless, females used more problem-focused strategies in response to family and school situations than males.

In summary, in addition to their demographics, there are several factors that may affect undergraduates' mental-well-being such as their satisfaction with the variety of roles they occupy in this transitory developmental stage. The association of selected coping strategies with psychological distress symptoms was studied and interpreted differently. This inconsistency resulted in ambiguity with regard to what strategies the health care professional and university personal would implement to maintain undergraduates' mental well-being. For example, it is unclear whether students' mental health conditions are related to more utilization of maladaptive coping strategies or to less utilization of the adaptive ones.

Accordingly, this paper has two specific aims. The first is to examine the relationship of selected mental health factors with selected demographics, life-satisfaction, and coping strategies among college students. The second is to determine the main predictors of depression, anxiety, and stress and their relative influence on each of these mental health factors.

Design and Sample

This is a secondary analysis of cross-sectional data collected in 2007 to assess the general well-being of college students at the University of Kentucky. After the Institutional Review Board approved, a sample of 1,700 full-time undergraduate students and aged 18-24 years old was selected by the Office of the Registrar. Students were passively consented by cover letter which was mailed to them with the survey, two-dollar incentive, and a stamped addressed return envelope, and a postcard was mailed separately indicating return of the questionnaire. One week later, postcards were sent to acknowledge students who responded and reminders cards were sent to those who had not responded to the initial survey mailing. Finally, a second survey package was sent to those who had not yet responded. Out of the 1700 mailed questionnaire, 112 were undeliverable or didn't meet the criteria. The response rate was 32% ($N = 508$).

Instruments

Depression Anxiety Stress Scale-21 (DASS-21) (Lovibond & Lovibond, 1995). DASS-21 is a short form of DASS which is a self-report 4-point Likert scale that measures the negative states of three mental health conditions: depression, anxiety, and stress. The DASS-21 measures each of the three factors via a 7-item subscale over the past week. Responses on each item are ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much*). The intensity of any of the three conditions is defined by the sum scores of responses to its 7-item subscale. According to Lovibond and Lovibond (1995), normal scores on the three subscales are scores that are less than 9 for Depression, 7 for Anxiety, and 14 for Stress. The Cronbach's alphas for the DASS–21 subscales have been examined in clinical and nonclinical samples and found to be 0.94 for Depression, 0.87 for Anxiety, and 0.91 for Stress (Antony, et al., 1998)

Brief COPE Inventory (BCI) (Carver, 1997). BCI is the abbreviated version of the original 60-item COPE Inventory of Carver et al. (1989). It is a 28-item self-report 4-point Likert-scale instrument that includes 14 2-item scales, which are categorized as adaptive and maladaptive. Responses on each item vary from 0, (*I usually don't do this at all*) to 3, (*I usually do this a lot*). Coping is the sum of the 28 items ranging from 0 – 84; adaptive coping is the sum of 16 items ranging from 0 – 48, and maladaptive coping is

the sum of 12 items ranging from 0 – 36. Higher score on either scale indicate more frequent use of that coping approach. Both the adaptive and maladaptive scales have shown good internal consistency in this sample with Cronbach's alphas equal to 0.88 and 0.81. Adaptive coping include strategies such as acceptance, planning, and positive reframing while the maladaptive strategies are those related to denial, self-blaming, and substance use.

The Brief Students' Multidimentional Life Satisfaction Scale (BSMLSS) (Huebner, 1994). BSMLSS is a 40-item self-report Likert scale in which responses range from 1 (*terrible*) to 7 (*delighted*). For the purpose of this study, 11 items were selected to resemble different aspects of students' life-satisfaction. This shortened version has shown good internal consistency in this sample with Cronbach's alpha equal to 0.85. Life-satisfaction is the sum scores of 11 items range from 1 – 77. Higher score indicates more satisfaction with life.

Statistical Analysis

Statistical analyses were conducted using SPSS statistical software (version 11.0, SPSS Inc, Chicago, Ill) and statistical significance (alpha) was set at $P < .05$. In the first phase of analysis, descriptive statistics were used to describe the demographics of the sample and the distribution of the three mental health factors among students.

To examine the relationship of selected mental health factors with life-satisfaction, and coping strategies, Pearson correlation was used. To determine how these factors are related to undergraduates' demographics and to compare their mean scores, on some continuous variables, such as mental health factors and coping, based on their demographics, Independent-samples t-test was used.

To determine the ability of maladaptive coping to predict depression, anxiety, and stress, after accounting for demographics, life-satisfaction, and adaptive coping, standard multiple regression was run. In this analysis, depression, anxiety, and stress were entered separately as dependent variables. Magnitude (R^2 change) was used to determine the amount of contribution of the significant independent variables in the model to the dependent variable. Standardized Beta (β) was used to determine the relative influence of each significant predictor in the model on the dependent variable. The data set was first checked for the assumptions of regression analysis using the residual scatter plot and the

normal probability plot. Scores of depression and anxiety were found to be positively skewed (skew = 1.65, 2.23, respectively); however, having a large enough sample size (N = 508) and more than ten observations for each predictor made the regression robust to departures from normality (Pallant, 2004). Tolerance values were found to be greater than .10, while VIF values were smaller than 10. Thus, no problem of multicollinaerity was found to exist.

Results

Sample Description

Students' demographic characteristics were comparable to the population of UK college students in terms of gender and ethnicity. The total number of undergraduates who participated in this study was 508; of these, 66% (n = 335) were female and 90% (n = 409) were Caucasian. The mean age of students was 20 years (SD = 1.6), and their mean GPA was 3.2 on 4-point scale (SD = .60). The mean scores of students' depression, anxiety, and stress were found to be normal and equal to 5.2 (SD = 7), 8 (SD = 9), and 11 (SD = 9), respectively. However, 29% of the students were depressed, 27% were anxious, and 24% were stressed. About 67% of students who were anxious were also depressed while 61% of the anxious students were also stressed.

Relationship of Mental Health Factors with Coping, Satisfaction, and Demographics

Higher depression scores were reported by seniors or those who aged 20 - 24 years than students in other class standing levels and the younger ones. Students who lived with someone and/or belonged to a social organization were less depressed, anxious, and stressed than those who did not. Students who identified themselves as religious were less depressed and anxious than those who were not religious. Female students were more anxious and stressed (see Table 1) and reported using adaptive and maladaptive coping strategies more frequently than the males (M = 21 $\pm$ 8 as compared to M = 18 $\pm$ 9, t = 3, P < .001) and (M = 7 $\pm$ 4.4 as compared to M = 4 $\pm$ 4, t = 4, P < .0001).

A significant positive association between stress and coping strategies, both adaptive and maladaptive, was detected (see Table 2). Students who more frequently used maladaptive coping strategies reported significantly higher levels of depression and anxiety. However, neither anxiety nor depression was significantly related to adaptive

coping. Students with greater dissatisfaction with life indicated higher levels of depression, anxiety, and stress. In addition, students with lower GPA were more depressed ($r = -.13$, $P < .05$). Other demographics such as ethnicity and the place of residency were not significantly related to any of the three mental health factors.

Independent Predictors of Depression, Anxiety, and Stress

Life-satisfaction, adaptive coping, maladaptive coping, and demographics were entered together as predictors of the three dependent variables in a three separate multiple regression analyses. Entered demographics included age, gender, class standing, GPA, living status, belonging to a social organization, and religious self-identification (religious or not).

The significant independent predictors of depression were maladaptive coping and life satisfaction (see Table 3). The overall model $F (10, 324) = 46.2$, $P < .0001$, accounted for 60% of the variance of depression. Likewise for anxiety, maladaptive coping, and life satisfaction were the only significant predictors (see Table 4) with the overall model $F (10, 324) = 24$, $P < .0001$, accounted for 43% of the variance of anxiety.

The significant predictors of stress were maladaptive coping, life satisfaction, gender, and GPA (see Table 5). The overall model $F (10, 324) = 29$, $P < .0001$, accounted for 50% of the variance of stress.

The Relative influence of Predictors

Maladaptive coping had the strongest influence on the three mental health factors, depression, anxiety, and stress ($\beta = 0.54, 0.60, 0.53$, $P < .0001$, respectively). For every one score increase in maladaptive coping, each of the three mental health factors increased by one score. Adaptive coping was not a significant predictor of any of the three mental health factors. As compared to the maladaptive coping, life satisfaction had a relatively low influence on the three mental health factors ($\beta = -.40, -.15, -.30$, $P < .0001$, respectively). For every one score increase in life-satisfaction, depression, anxiety, and stress decrease only by .36, .11, .30 score.

Most demographics were non-significant predictors. Even though gender and GPA were significant predictors of stress, they had very low influence ($\beta = .09$ for each).

Discussion

The bivariate analysis findings were consistent with the literature regarding to how undergraduates' depression, anxiety, and stress are related to coping style, life-satisfaction, and demographics. For instance, the negative association between undergraduates' GPA and being religious with their depression and anxiety has been indicated by Hagerty and Williams (1999), Haines, Norris, and Kashy (1996), and Trockel, Barnes, and Egget (2000) and Harris, Schoneman, and Carrera (2002) and Phillips and Henderson (2006). In addition, the negative relationship between life-satisfaction and depression, anxiety, and stress was consistent with Doyle, Irons, Owens, and Nassar, (2005), Saunders and Roy, (2000), and Wong et al., (2007).

The social aspect of students' life was also identified as important for undergraduates' mental wellbeing (Misra & McKean, 2000a). Consistantly, we found that students who lived with someone and those who belonged to a social organization were less depressed, anxious, and stressed. However, a comprehensive assessment of this dimension in relation to students' psychological well-being is recommended.

Consistent with findings from previous studies, such as Bayram and Bilgel (2008) and Wong, et al. (2007), there was no gender difference in undergraduates' mean scores of depression; yet, female students reported higher levels of anxiety and stress than the males. Undergraduates' gender difference on their levels of anxiety has been constantly reported in the literature (Chapell, et al., 2005; Howley & Dickerson, 2003; Misra & McKean, 2000a; Oliver, et al., 1998). Several studies referred to this difference as related to females more frequent use of emotion-focused coping strategies, which are usually interpreted as ineffective coping (e.g.Garnefski, et al., 2004; Hänninen & Aro, 1996; Vingerhoets & Van Heck, 1990). However, with the use of the Brief COPE Inventory in this study, some of the emotion-focused strategies, such as positive reappraisal and seeking social support, were categorized as adaptive while others, such as self-blaming and denial, were maladaptive. Our findings suggested that although female students used both adaptive and maladaptive coping more than the male, they had higher levels of anxiety. Due to design limitation in the current study and the inconsistency in the operational definition of coping in the literature, adaptive versus the maladaptive (Parker & Endler, 1992), it was difficult to interpret the gender differences in students' anxiety

within the context of coping. Using a multidimensional approach in future studies may help to understand the different factors that contribute to anxiety and shed the light on the role of gender in coping and anxiety.

The cross-sectional design and use of one setting were limitations in this study. Future research with longitudinal assessments and including non-college young adults would strengthen the understanding of maladaptive coping strategies and anxiety in young adults.

Although the bivariate analysis showed significant associations between certain demographics and the three mental health factors, running multiple regression revealed that none of these demographics was a significant predictor of depression and anxiety. Even though GPA and gender were significant predictors of stress, their influence was low.

These findings provide additions to the literature with regard to the role of coping in predicting the mental well-being of undergraduates. Most of the research in this field is concentrated on teaching undergraduates strategies to cope "adaptively" with psychological distress symptoms related to their college life. Examples of these strategies include physical exercise training (Steptoe, et al., 1997) and mindfulness meditation training (Beddoe & Murphy, 2004; Jain, et al., 2007). The current findings suggest that diminishing maladaptive coping strategies may have the greatest positive impact on reducing depression, anxiety, and stress among undergraduates.

Accordingly, it is recommended that the college health personnel help students understand how certain maladaptive behaviors, such as self blaming and avoidance, may have a negative influence on their mental wellbeing. In addition, future research may need to further investigate the cognitive aspect of undergraduates' coping and its relation to mental well being.

Table 3.1: Relationship between DASS-21 and Students' Demographics

	n	Depression		Anxiety		Stress	
		M	SD	M	SD	M	SD
Age							
18 – 19	179	9.2	(10)	6	(8)	11	(9.3)
20 – 24	189	7	(8)	5	(6)	10.2	(9)
		$t^* = 2.3$		$t = 1.8$		$t = 0.8$	
Gender							
Female	299	8.3	(9)	6	(7)	12	(9)
Male	154	7	(8)	4	(6)	9	(8)
		$t = 1.8$		$t^{**} = 3$		$t^{***} = 4$	
GPA							
1. 3.5 – 4	129	8.6	(7)	33	(21)	78	(26)
2. 3 – 3.49	129	6.9	(8)	32	(20)	62	(21)
3. 2.5 – 2.99	74	9	(11)	37	(24)	74	(25)
4. 2 – 2.49	23	13	(12.5)	54	(35)	87	(29)
		$F^* (3, 351) = 4$		$F^* (3, 351) = 3$		$F^* (3, 351) = 3$	
		4 > 3 =2 = 1		4 > 3 =2 = 1		-	
Class Standing							
1. Freshman	111	8	(9)	49	(31)	115	(38)
2. Sophomore	93	10	(11.3)	107	(69)	186	(62)
3. Junior	109	8.4	(9)	137	(88)	264	(88)
4. Senior	141	6	(7)	19	(12)	37	(12)
		$F^* (3, 450) = 4$		$F^* (3, 450) = 2$		$F^* (3, 450) = 1$	
		2 > 1 =3 = 4		-		-	
Residency							
On-campus	164	7.33	(8.2)	49	(31)	115	(38)
Off-campus	293	8	(9.2)	107	(69)	186	(62)
		$t = - 0.76$		$t = .02$		$t = - .01$	
Live alone	56	10	(9.8)	8.43	(9)	13	(10)
Live with someone	398	7.4	(8.6)	5	(6)	10	(9)
	293	$t^* = - 2.12$		$T^{**} = 3$		$t^* = 2$	

Table 3.1 (continued)

	n	Depression		Anxiety		Stress	
		M	SD	M	SD	M	SD
Religious							
Yes	352	7.2	(8.5)	4.6	(6.3)	10	(9)
No	102	9.5	(9.5)	7	(7.6)	11.6	(9)
		$t^* = 2.3$		$t = 3.16$		$t = 1.4$	
Ethnicity							
Caucasian	409	7.6	(8.7)	5	(6.6)	10.4	(8.8)
Others	45	9	(9.7)	6.4	(7.3)	12	(9.4)
		$t = -1$		$t = -1.33$		$t = -1$	
Belonging to social organization							
Yes	97	5.1	(3.5)	4.12	(5.2)	9	(7.5)
No	356	8.5	(9.4)	5.5	(7)	11	(9)
		$t^{***} = -1$		$T^* = -2.3$		$t^* = -2$	

* $P < .05$, *** $P < .0001$

Table 3.2: Means, Standard Deviations, and Correlations of Depression, Anxiety, and Stress with Life-Satisfaction and Coping

Variable	M	SD	Depression	Anxiety	Stress
Life-satisfaction (1 – 77)	54.64	9.63	- .53***	- .34***	- .39***
Coping (0 – 84)	32.30	12.51	.29***	.30***	.40***
Adaptive Coping (0 – 48)	22.85	9.24	.03	.09	.18***
Maladaptive Coping (0 – 36)	9.45	5.50	.62***	.55***	.63***

*** $P < .0001$

Table 3.3: Multiple Regression Model Predicting Depression Scores

Predictor	*B*	SE *B*	*B*
Maladaptive coping	1.10	.09	.54***
Adaptive coping	- .08	.05	- .07
Life satisfaction	- .40	.04	- .40***
Age	.05	.40	.00
Gender (female)	.50	.70	.03
GPA	.50	.60	.03
Social Organization	- .80	.83	-.04
Living alone	- 1.00	1.00	-.04
Being religious	- .72	.80	-.03
Class standing	- .40	.50	-.05

*** $P < .0001$

Table 3.4: Multiple Regression Model Predicting Anxiety Scores.

Predictor	B	SE B	β
Maladaptive coping	1.00	.08	.60***
Adaptive coping	.00	.04	.00
Life satisfaction	- .11	.04	-.15**
Age	- .02	.31	.00
Gender (female)	.32	.63	.02
GPA	.44	.54	.04
Social Organization	.30	.73	.02
Living alone	1.50	.84	.08
Being religious	- 1.32	.70	-.08
Class standing	- .43	.50	-.07

** $P < .001$, *** $P < .0001$

Table 3.5: Multiple Regression Model Predicting Stress Scores.

Predictor	B	SE B	β
Maladaptive coping	1.10	.10	.53***
Adaptive coping	.05	.05	.04
Life satisfaction	- .30	.04	- .30***
Age	.03	.40	.00
Gender (female)	1.7	.80	.09*
GPA	1.50	.70	.09*
Social Organization	.40	.95	.02
Living alone	- .20	1	.00
Being religious	- .40	.90	- .02
Class standing	.22	.60	.03

* $P < .05$, *** $P < .0001$

CHAPTER FOUR

The Relationship of Anxiety, Coping, Thinking Style, Life Satisfaction, Social Support, and Selected Demographics Among Young Adult College Students

Introduction

According to the 2008 National College Health Assessment Survey, nearly half (49%) of college students experienced "overwhelming anxiety" in the last year (American College Health Association, 2008). Unmanaged anxiety can increase risk for physical and mental health problems such as heart disease (Kawachi, Sparrow, Vokonas, & Weiss, 1994), depression (Yapko, 1992), and substance use in young adults (Buckner, Bonn-Miller, Zvolensky, & Schmidt, 2007). According to Kessler et al. (2005), the onset of mental illness often occurs during or shortly before college age and can be precipitated by the stress and anxiety of attending college, leaving home, building new relationships, and pressure to succeed (Kadison, 2004).

The increasing concern about anxiety among undergraduate students is evident in the body of literature that has emerged providing possible explanations for this phenomenon. These explanations were derived from cognitive, behavioral, physiological, psychosocial, and developmental theories. This variety in theoretical explanations led to the conclusion that anxiety cannot be evaluated using one standard theoretical model. Rather, a comprehensive evaluation of anxiety requires a multidimensional approach (McLean & Woody, 2000; D. Smith & Bar-Eli, 2007). Further, McLean, and Woody (2000) assert that a multidimensional approach should include the cognitive, behavioral, psychological, and physiological dimensions of anxiety.

Researchers evaluating anxiety in undergraduates have examined one of three aspects: 1) behavioral aspect of the anxiety, which was mainly focused on the coping strategies (Blalock & Joiner, 2000; Endler, et al., 1994; Sideridis, 2006); 2) the psychosocial aspect which included social support factors and/or satisfaction with life (Eldeleklioglu, 2006; Friedlander, Reid, Shupak, & Cribbie, 2007; Misra & McKean, 2000b); or 3) the cognitive aspect which is related to the negative thinking (Morrison & O'Connor, 2005). Findings from these studies have lead to proposal and development of different interventions for reducing anxiety among undergraduates.

Authors of recent reviews of the literature for stress and anxiety management interventions in college students (Jones & Johnston, 2000; Shapiro, Shapiro, & Schwartz, 2000) concluded that, due to this wide variety of proposed interventions and testing methods, it was difficult to compare their efficacy for managing stress and anxiety. They concluded that for effective development of population-specific interventions, it is important to develop a comprehensive evaluation of the factors that could be related to anxiety and account for the moderating ones. Thus, the purpose of this paper was to synthesize the theoretical explanations of anxiety into an integrated model and evaluate it in a sample of young adult college students at a large southeastern university in the United States.

Theoretical Background

Throughout their transition from adolescence to adulthood, young adults (age 18 – 24 years) have two main goals, establishing vocational identity and intimate relationships (Roisman, Masten, Coatsworth, & Tellegen, 2004). Failure to achieve independence and accomplishing these developmental goals is considered stress-arousing and anxiety-provoking in this age group (Arnett, 2001b, 2004; Zirkel, 1992; Zirkel & Cantor, 1990). In an industrialized country such as the United States, individuals in this age group face several challenges related to their education, career, and social life that may delay or sometimes impede their attainment of these goals. Arnett (2000) has used the term emerging adults to describe this developmental time frame.

Compared to the past cohorts, these emerging American adult cohorts have higher achievement expectations for their education and career (Goyette, 2008). Baird, Burge, and Reynolds (2008) relate this phenomenon to the society's shifting values toward education and work over the past several decades which are characterized by an educational philosophy that emphasizes higher education for all and weak institutional links between education and work. Arnett (2007) explains that due to these high achievement expectations, the identity establishment task can be a disorienting and difficult experience rather than a normal part of the development for this age group. This difficulty seems most likely to occur when high expectations for education, work, and relationships, do not match real life, which may diminish life-satisfaction and ultimately lead to anxiety. The quality of life (QOL) model of depression and related disorders

(Frisch, 1998, 2006) predicts that low levels of life satisfaction may result in anxiety. To date, this assumption has not been tested among young adults.

Trying to satisfy their higher level needs, such as self-actualization and self-esteem, through higher education and work, young adults tend to delay building serious intimate relationships and marriage. This resulted in an increase in the percentage of single American young adults who are experiencing loneliness and isolation which increase their risk for anxiety (Twenge, 2007). Several studies have indicated that loneliness and social isolation were associated with higher levels of anxiety among young adult college students (Chang, Sanna, Chang, & Bodem, 2008; Jackson & Cochran, 1991; Russell, Peplau, & Cutrona, 1980). The association between loneliness and anxiety was related to the lack of social support which is usually provided through intimate relationships, friendships, and social networks (Cohen & McKay, 1984; Ell, 1984).

According to the social support theory (Cohen, et al., 1985), the social support actions of others, such as advice and reassurance, and the belief that the support is available decreases the perception of potentially threatening situations as stressful and improves coping skills. Conversely, the lack of social support can aggravate stress and anxiety. In addition, according to the Quality of Life model, lack of social support may diminish life satisfaction (Campbell, et al., 1976).

Factors that were related to social support and anxiety include marital status and being self-identified as religious. Compared to the married adults of the same age, single adults have less social support and higher levels of anxiety (Mirowsky & Ross, 2003; Ross, Mirowsky, & Goldsteen, 1990). In a recent literature review, Koenig (2001) noted that religious individuals have more social support and lower levels of anxiety. However, researchers who examined the relationship between social support and anxiety have produced contradictory results. While Caldwell and Reinhart (1988) and Haemmerlie, Montgomery, and Melchers (1988) indicated that individuals with less perceived social support scores reported higher levels of anxiety, Davis, Kerr, and Kurpius (2003) and Eldeleklioglu (2006) documented that students' anxiety is not related to their perceived social support.

Behaviors and attitudes that are related to social support, such as seeking emotional support, are considered adaptive (Carver, et al., 1989). Lazarus and Folkman

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(1996) in the transactional model of coping proposed that adaptive coping strategies, which involve active coping behaviors to resolve a stressful situation, are a buffer that neutralizes the effect of stress and promotes psychological well-being. On the other hand, maladaptive coping is unsuccessful resolution of stressful situations and is associated with anxiety. In fact, there is evidence that the more frequently people utilize passive coping strategies, the higher their levels of anxiety (Heppner et al., 1995). Compared to older adults, young adults tend to use more maladaptive/passive coping strategies (Blanchard-Fields, 2007; Hunt, Wisocki, & Yanko, 2003).

Maladaptive coping behaviors can be precipitated by low level of life satisfaction (Frisch, 1998, 2006) and negative thinking (Beck & Clark, 1997). According to the quality of life model of life satisfaction, the perception that important needs have not been met or fulfilled may diminish life satisfaction (Campbell, et al., 1976) which in turn may lead to negative thinking (Frisch, 1998, 2006). According to the information processing model of anxiety (Beck & Clark, 1997), negative thinking or negative cognitive processing of stressful situations activates the primal cognitive mode, which is described as a subconscious psychological scheme concerned with the organism survival (i.e. fight-flight) that may lead to maladaptive coping behaviors such as avoidance. Conversely, positive perception of the situation may enhance adaptive coping.

Other factors that can be related to maladaptive coping and anxiety in this population include gender, age, and class standing. Some researchers identified gender differences in anxiety levels among young adults with females more frequently using maladaptive/passive coping strategies (Blalock & Joiner, 2000; Endler & Parker, 1990). Similarly, others found that females score higher on negative thinking measures (Lyubomirsky & Nolen-Hoeksema, 1995; Wupperman & Neumann, 2006) which in turn may lead to maladaptive coping (Beck & Clark, 1997).

Using maladaptive coping strategies, such as avoidance, may decrease over the life span (Whitty, 2003) and years in college. For example, Misra, McKean, West, and Russo (2000) noted that freshmen showed more maladaptive coping behaviors, in response to stress, than upperclassmen. Yet, a longitudinal panel study indicated that the level of experienced stress and use of maladaptive coping increased from the freshmen to senior years (Grour, Thomas, & Shoffner, 1992). Nelson, Karr, and Coleman (1996)

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explained that, due to the transition-related challenges of freshmen and seniors (e.g. change in social network, transition from home to college and from college to work), each group experienced more psychological and physical distress symptoms than sophomores or juniors.

As discussed, the quality of life model of depression and related disorders (Frisch, 1998, 2006) proposes a direct relationship between life satisfaction and anxiety. The social support theory proposes a direct relationship between social support and anxiety. However, neither of these two relationships has been confirmed by research.

Eight hypotheses (H) were proposed to establish the indirect and direct relationships of the selected constructs within the proposed model (Figure 1).

(H$_1$)   Anxiety results from maladaptive coping behavior (Beck & Clark, 1997; Lazarus & Folkman, 1996).

(H2)   Maladaptive coping is influenced by negative thinking (Beck & Clark, 1997) and low levels of life satisfaction (Frisch, 1998, 2006) and can be altered by demographics such as gender, age, and class standing.

(H3)   Maladaptive coping decreases positive thinking (Beck & Clark, 1997).

(H4)   Negative thinking is influenced by low levels of life satisfaction (Frisch, 1998, 2006) and being female (Nolen-Hoeksema & Jackson, 2001; Wupperman & Neumann, 2006).

(H5)   Adaptive coping behaviors decreases the anxiety (Lazarus & Folkman, 1996).

(H6)   Adaptive coping behaviors are influenced by positive thinking (Beck & Clark, 1997), social support (Cohen & McKay, 1984), and being religious (Lerner, Lerner, & Finkelstein, 2001).

(H7)   Life satisfaction is enhanced by perceived social support (Campbell, et al., 1976).

(H8)   Social support is enhanced by being married (Mirowsky & Ross, 2003; Ross, et al., 1990) and being religious (Koenig, 2001) and can be diminished by living alone (Newman & Newman, 2008).

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Methods

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Study design and Participants

        This was a cross-sectional on-line survey study (see Appendix B for complete questionnaire). A random sample of 4000 undergraduate students with email addresses was obtained from the University of Kentucky Office Records Custodian. Eligible students were those who are full-time, aged 18-to-24- years, and have convenient access to the Internet.

Measurement of Variables

        Anxiety. Anxiety was measured using the Anxiety subscale in the 21-item version of the Depression Anxiety Stress Scale (DASS-21) (Lovibond & Lovibond, 1995). DASS-21 is a self-report 4-point Likert scale that measures three constructs: depression, anxiety, and stress. The level of anxiety is determined by sum score of responses to 7 items related to physiological hyperarousal and fearfulness. Non-anxious scores range from 0 to 7 (Lovibond & Lovibond, 1995). The DASS–21-Anxiety was shown to have good internal consistency reliability with Cronbach's alphas equal to .87 (Antony, et al., 1998).

        Coping. Coping was measured using the Brief COPE Inventory (BCI)(Carver, 1997). BCI is the shortened version of the original 60-item COPE Inventory of Carver, Scheier, and Weintraub (1989). It is a self-report 4-point Likert-scale instrument composed of 28 items. Responses on each item vary from 0, (*I usually don't do this at all*) to 3, (*I usually do this a lot*). Coping is the sum of the 28 items ranging from 0 – 84. Adaptive coping was the sum of 16 adaptive items with scores ranging from 0 – 48. Maladaptive coping was the sum of 12 maladaptive items with scores ranging from 0 – 36. Higher score on either scale indicate more frequent use of that coping style. Both the adaptive and maladaptive scales have shown good internal consistency reliability in this sample with Cronbach's alphas equal to 0.88 and 0.81, respectively. Adaptive coping includes strategies such as active coping, planning, and positive reframing while the maladaptive strategies are related to denial, self-distraction, and substance use.

        Life Satisfaction. The Brief Students' Multidimentional Life Satisfaction Scale (BSMLSS)(E. S. Huebner, 1994) was used for measuring life satisfaction. BSMLSS is a 40-item self-report Likert scale in which responses range from 1 (*terrible*) to 7

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(*delighted*). For the purpose of this study, 11 items were selected to address different aspects of students' life-satisfaction (e.g. academic and financial). This shortened version has shown good internal consistency reliability in this sample with Cronbach's alpha equal to 0.85. Life-satisfaction was the sum score of 11 items and ranged from 1 – 77. Higher scores indicated more satisfaction with life.

Positive thinking. The Positive Automatic Thoughts Questionnaire (ATQ-P) (Ingram & Wisnicki, 1988) was used to measure positive thinking. The ATQ-P is a 30-item 5-point Likert scale assessing the frequency of positive thoughts (such as *life is exciting*). Responses to each item are rated on a range from 1 (*never*) to 5 (*all the time*). This instrument has been shown to have good internal consistency reliability with Cronbach's alpha equal to 0.94 (Ingram & Wisnicki, 1988). The ATQ-P is scored by summing the 30 items. Total scores range from 30 – 150. Higher scores indicate more automated positive thinking.

Negative thinking. The Cognitions Checklist (CCL) (Beck, Brown, Steer, Eidelson, & Riskind, 1987) was used to measure negative thinking. *The CCL* is a 26-item 5-point Likert-type self-report instrument designed to measure the frequency of negative thoughts in two main domains,f depressive (CCL-D) and anxious (CCL-A) thoughts. For the purpose of this study the CCL-A was used to measure negative thoughts related to anxiety such as (*I am not a healthy person*). The two subscales have shown good internal consistency with Cronbach's alpha equal to 0.90 (Beck, et al., 1987). Responses on each item range from 0, (*never*) to 4, (*always*). The CCL-A is scored by summing the 12 items with total scores ranging from 0 – 48. Higher scores indicated more frequent negative thoughts.

Social Support. The Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, Dahlem, Zimet, & Farley, 1988) was used to measure social support. The MSPSS is a 12-item 7-point Likert scale that measures three aspects of perceived support on three 4-point subscales, Family, Friends, and a Significant Others. Responses range from 1 *(very strongly disagree)* to 7 *(strongly agree)*. The three subscales have shown good discriminate validity and internal consistency with alpha reliability equal to 0.91, 0.89, 0.91, respectively (Canty-Mitchell & Zimet, 2000). Scores on each subscale

range from 7 – 28, higher scores on any subscale indicated greater perception of social support.

Demographic Questionnaire. A short personal information questionnaire was developed by the author and included gender, marital status, age, class standing, living status (alone or with someone), and whether they define themselves as religious or non-religious.

Procedure

With the Institutional Review Board approval, students were sent an email requesting their participation in the study and included a link to the survey website. Students were passively consented through a consent letter presented on the homepage of the study survey website. Students who agreed to participate by clicking "I agree" were directed to the survey.

Three brief email reminders were sent over three weeks. Those who did not complete the questionnaire were considered non-respondents. Participants were offered a coupon for a free drink at the UK dining services.

Data Analysis

Data analysis was conducted using SPSS statistical software (version 11.0, SPSS Inc, Chicago, Ill). An alpha of .05 was set a priori. Descriptive statistics were used to summarize the demographic variables of the sample and the distribution of anxiety scores among students. To examine if students differ in their anxiety levels based on their demographics, Independent-samples *t*-test or ANOVA were used as appropriate. Pearson correlation was used to examine how the continuous variables were related to anxiety.

Path analysis technique was used to examine the proposed model. This method allows for estimating the direct and indirect effects for variables in which the causal ordering is theoretically established (Kothari, 2008). Endogenous variables in the hypothesized model were defined as those whose variation is explained by factors within the model (Burns & Grove, 2005) and included social support, life satisfaction, adaptive coping, maladaptive coping, negative thinking, and positive thinking. Exogenous variables are those whose variation is explained by factors outside the model (Burns & Grove, 2005) and include demographics. Because the proposed model was recursive, ordinary least square regression analysis was used to obtain the path estimates (Musil,

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Jones, & Warner, 1998). A series of seven multiple regressions were run. Preceding variables in a regression run were defined as those that were proposed in the hypothesized model to have a path relationship (direct, indirect, or both) with the outcome variable.

In the first regression, the result variable, anxiety, was regressed on the selected demographics, social support, life satisfaction, adaptive coping, maladaptive coping, positive thinking, and negative thinking. In subsequent regression runs, each endogenous variable in the model was regressed on the preceding variables.

Magnitude (R^2 change) was used to determine the amount of contribution of the independent variables in the model to the dependent variable. Standardized Beta (β) was used to determine the path estimate in the model and relative influence of each significant predictor on the dependent variable. The data were first checked for violations of the assumptions of regression analysis using the residual scatter plot and the normal probability plot.

Results

Students Demographics

The total number of undergraduates who participated in this study was 257. Of these, 65% (n = 146) were female and 90% (n = 229) were Caucasian. About 94% of the students were singles while 86% indicated living with someone. The majority of students (68%) identified themselves as religious. Nearly half of the sample was seniors (53%), 14% were professional students, and 33% were juniors. The number of students who responded as freshman and sophomores was too small to include in the analysis. The mean age of students was 21.6 ($\pm$ 1).The mean anxiety score was 11 ($\pm$ 3.8) indicating moderate anxiety. About 78 % of the students (*n* = 198) scored above the normal level on the DASS-21-A (Lovibond & Lovibond, 1995), higher than 7.

Bivariate Analysis

Bivariate analysis was conducted to evaluate how the exogenous (variation outside the model) and endogenous (variation inside the model) variables were related to anxiety. Except for age, students did not differ in their levels of anxiety based on their demographics. Older students reported higher levels of anxiety (*r* = .16, *P* < .05). All the

endogenous variables were significantly related to anxiety (Table 1). Certain factors, such as social support, life satisfaction, positive thinking, and adaptive coping, were negatively related to anxiety. Conversely, negative thinking and maladaptive coping were associated with higher levels of anxiety.

Test of the Proposed Model

Regressing anxiety level on all preceding variables in the hypothesized model indicated that only maladaptive coping and negative thinking were significant predictors of anxiety (Table 3). The overall model, $F (13, 190) = 18$, $P < .0001$, accounted for 55% of the variance in anxiety with negative thinking having the strongest relationship to anxiety ($\beta = 0.50$, $P < .0001$). This finding partially supported H_1, there were two significant direct paths to anxiety, one through negative thinking and the other through maladaptive coping (Figure 2).

Table 4 presents the path coefficients (β) for the predictors of the endogenous variables in the hypothesized model.

Findings provided partial support for H_2 and H_8:

(H_2)   Maladaptive coping was predicted by negative thinking and living alone, but neither life-satisfaction nor age or class-standing was a significant predictor of maladaptive coping.

(H_8)   Social support was influenced by being religious but not by marital or living status.

Findings supported H_4, H_6, and H_7:

(H_4)   Negative thinking was negatively associated with life-satisfaction and positively associated with being female.

(H_6)   Adaptive coping was predicted by positive thinking, social support, and being religious.

(H_7)   Life satisfaction was enhanced by perceived social support.

Findings did not support H_3 and H_5:

(H_3)   Adaptive coping was not negatively related to anxiety levels and the maladaptive coping was not negatively related to positive thinking.

(H_5)   Positive thinking was predicted by being a professional student rather than a senior or a junior student. In addition, the estimated model suggested

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that negative thinking mediated the relationships of social support, life satisfaction, gender, to anxiety, while maladaptive coping mediated the relationship between living alone to anxiety.

Testing for Mediation

The estimated model suggested that maladaptive coping mediated the relationship between living alone and anxiety. It also showed that negative thinking mediated the relationship between social support, life satisfaction, being female, and anxiety.

To demonstrate mediation, using the regression approach as recommended by Frazier, Tix, and Barron (2004), four conditions must hold: (1) the predictors, (life satisfaction, being female, and living alone), must be significantly associated with the hypothesized mediators (negative thinking and maladaptive coping, respectively); (2) the predictors, (life satisfaction, being female, and living alone), must be significantly associated with the outcome variable (anxiety); (3) the mediators, (negative thinking and maladaptive coping), must be significantly associated with the outcome variable (anxiety); and (4) the impact of the predictors, (life satisfaction, being female, and living alone), on the outcome variable (anxiety) is less after controlling for the mediators (negative thinking and maladaptive coping). Table 4 summarizes the findings of the mediation analysis.

Discussion

Students' anxiety was primarily related to their negative thinking and maladaptive coping. The current findings indicate that the cogintive-behavior interaction is the core aspect of anxiety. Although the estimated model does not suggest causality, findings supported the information processing model of anxiety (Beck & Clark, 1997) in terms of the sequential order of negative thinking and maladaptive coping in their relationship with anxiety. Future experimental study design is recommended to test for causation.

The mediation role of maladaptive coping and negative thinking, suggested in the estimated model, helped explain how students may differ in their reported symptoms of anxiety based on demographics, such as gender and marital status. Consistant with previous studies' results, being female predicted higher scores on negative thinking (Nolen-Hoeksema & Jackson, 2001; Wupperman & Neumann, 2006). Negative thinking

mediated the relationship between being female and anxiety. This suggests that negative thinking may contribute to females' higher scores on anxiety measures which has been consistantly noted in the litrature (e.g. Chapell, et al., 2005; Howley & Dickerson, 2003; Misra & McKean, 2000b; Oliver, Reed, & Smith, 1998).

Twenge (2007) proposed that single young adults who live alone were at higher risk for experiencing anxiety. Likewise, Huebner, Royer, and Moore (1981) stated that the intensity of stress experienced by young adult college students who lived alone was higher than those who lived with someone (Huebner, 1981). In a previous path analysis study among young adults, Eaton (1978) attributed the difference in the perception of life stressors to the lack of social support due to being single or living alone. The path analysis included social support as related to life stressors but did not include the effect of cognitive or behavioral constructs. Our findings indicated that being married or living with someone was not necessarily a source of social support for college students and that perceived social support did not predict students' anxiety. Rather, it was the more frequent use of maladaptive coping strategies used by those who lived alone, that contributed to their anxiety level.

The model suggestd a sequential order of psychosocial, cognitive, and behavioral factors, based on their direct and indirect relationship to anxiety, and provided invaluable insight for interpreting findings from previous studies and planing future research.

Contrary to findings from previous descriptive studies (Caldwell & Reinhart, 1988; Haemmerlie, et al., 1988), the model did not support a direct relationship between social support and anxiety. As suggested in the model, the role of social support was enhancing the students' life satisfaction but was not directly related to anxiety.

Consistently, Anthony and O'Brien (2002) indicated that a social support-group intervention did not produce a significant effect on the subjective or the objective symptoms of anxiety among college students. However, the intervention improved their perceived social support and satisfaction with social-life. On the other hand, other studies indicated that social support interventions enhanced students' college-adjustment (Lamothe, et al., 1995; Pratt, et al., 2000) and thus it was recommended for implementation as a primary prevention intervention (Mattanah, et al., 2010). In support of this recommendation, our estimated model suggests that adaptive coping was mostly

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predicted by the perceived social support. Future intervention and prospective longitudinal studies are recommended to test the efficacy and the long term effect of social support interventions in promoting college students' adaptive coping.

However, the role of adaptive coping strategies in the phenomenon of anxiety is still unclear. Hirokawa, Yagi, and Miyata (2002) developed a program for training college students on adaptive/active coping strategies such as cognitive reappraisal, social skills, and relaxation exercise (Hirokawa, et al., 2002). They found that the intervention was not effective in reducing the perception of stressors in students with high levels of anxiety. However, students with low levels of anxiety had a significant decrease in their perception of stressors. It is possible that adaptive coping interventions may help manage stressors when anxiety is low or absent; however, their direct effect on anxiety is not confirmed. With the absence of a path from adaptive coping to anxiety in the estimated model, an important research question can be raised: Does adaptive coping improve stress management and thus prevent anxiety or does anxiety have to be reduced for stress management to be effective?

Studies that evaluated adaptive coping interventions, such as mindfulness meditation, noted that it was effective in reducing college students' anxiety (Astin, 1997; Kang, Choi, & Ryu, 2009; Shapiro, et al., 1998). However, these studies used a non-active control groups which, according to a recent literature review, may not be an adequate design for validating the direct effect of mindfulness meditation on the outcome symptoms such as anxiety (Toneatto & Nguyen, 2007). Especially with the absence of the double blind-technique, there is always risk for cross-group contamination and it is difficult to determine whether the improvement was related to the direct effect of the intervention or to the bias by the participants knowing what they are receiving (Berger & Wong, 2009). Studies that investigated the adaptive mechanism of action of mindfulness meditation indicated that its effect on anxiety was mediated by negative thinking (Jain, et al., 2007; Sears & Kraus, 2009). Given the direct path from negative thinking to anxiety suggested in our estimated model, along with mediation effect of negative thinking on anxiety indicated by these two studies, developing and testing interventions that directly target negative thinking for managing anxiety in college students might be most promising.

There were too few freshmen and sophomores to include these groups in the analysis. This limited the comparison of anxiety levels across the class-standing to those in the upper-classes. Another limitation in this study is the very low response rate (7%) as compared to response rate for a similar previous paper-and-pencil survey (60%) in the same population and setting (Staten, et al., 2007). The first year college students in Sax, Gilmartin, and Bryant's (2003) study showed lower response rate to the web-based method. Thus, using the paper-and-pencil surveys with freshmen, particularly, may promote higher response rates and more representative class-distribution. Additionally, this study was cross-sectional measuring one point in time and within one university. A longitudinal study over multiple settings, to include college and non-college young adults, would better capture how anxiety and factors that affect anxiety change over time as one grows and matures.

In conclusion, to adequately study anxiety among young adults, studies across time, using effective methods of data collection and measures that differentiate between types of emotional distress of depression, anxiety and stress, and testing interventions that affect the direct factors that contribute to anxiety will most likely yield the best results.

Table 4.1: Mean, Standard Deviations and Correlation of continuous variables with Anxiety (N = 257)

	M	SD	Anxiety
Social support (21 – 84)	67.50	14.5	- .40***
Satisfaction (1 – 77)	32.3	6	- .50***
Coping (0 – 84)	55	8	.20**
Adaptive Coping (0 – 48)	39	7	- .20**
Maladaptive Coping (0 – 36)	16.2	5	.61***
Positive thinking (30 – 150)	103	23	- .40***
Negative thinking (0 – 48)	19	8	.71***

* $P < .05$, *** $P < .0001$

Table 4.2: Multiple Regression Model Predicting Anxiety Scores

Predictor	B	SE B	β
Age	.40	.22	.12
Class standing-Senior	- .01	.50	.00
Class standing-Professional	.50	.81	.04
Marital status-Married	- .04	.80	.00
Gender-Female	.34	.41	.04
Living alone	.60	.60	.05
Religious-Yes	.40	.40	.05
Social support	.00	.02	- .02
Life satisfaction	- .10	.05	- .15
Adaptive coping	- .01	.03	- .02
Positive thinking	.01	.01	.08
Maladaptive coping	.20	.05	.24***
Negative thinking	.30	.03	.50***

*** $P < .0001$

Table 4.3: Standardized Coefficients for Predictors of the Endogenous Variables in the Proposed Model.

Predictors	Negative Thinking	Maladaptive Coping	Satisfaction	Social Support	Adaptive Coping	Positive Thinking
Age		.10			-.04	-.10
Class standing-Senior		.04			.05	.10
Class standing-Professional		- .01			.06	.20*
Marital status-Married	.06	- .02	-.02	.12	-.02	-.02
Gender-Female	.14*	- .10			-.10	-.10
Living alone	.06	.13*	.04	.10	-.04	.10
Religious-Yes	.00	.00	.10	.22**	.13*	-.02
Social support	- .12	-.10	.70***		.43***	.10
Life satisfaction	- .40***	-.15			-.04	.50***
Adaptive coping						
Positive thinking					.23**	
Maladaptive coping					.10	-.10
Negative thinking		.50***			.06	-.10
R^2	.21	.40	.50	.30	.30	.50
F	$F=10^{***}$ (6, 221)	$F=14^{***}$ (10, 208)	$F=50^{***}$ (4, 226)	$F=7^{***}$ (3,244)	$F=7^{***}$ (12,192)	$F=16^{***}$ (11,196)

*$P < .05$, **$P < .001$, ***$P < .0001$

Table 4.4: Standardized Coefficients for Predictors (Life-satisfaction, Gender, and Living Alone) and Mediators (Negative Thinking and Maladaptive Coping) of Anxiety

Independent variable	Dependent variable	β	P-value	Memo
Life-satisfaction	Negative thinking	- .40	< .0001	
Gender (Female)	Negative thinking	.14	< .05	Condition 1 is supported
Living alone	Maladaptive coping	.13	< .05	
Life-satisfaction	Anxiety	- .33	< .0001	
Gender (Female)		.14	< .05	Condition 2 is supported
Living alone		.15	< .05	
Negative thinking	Anxiety	.55	< .0001	
Maladaptive coping		.24	< .0001	Condition 3 is supported
Life-satisfaction	Anxiety	- .15	NS	
Gender (Female)		.04	NS	Condition 4 is supported
Living alone		.05	NS	

Figure 4.1: Proposed Hypothetical Model of Young Adult College Students' Anxiety
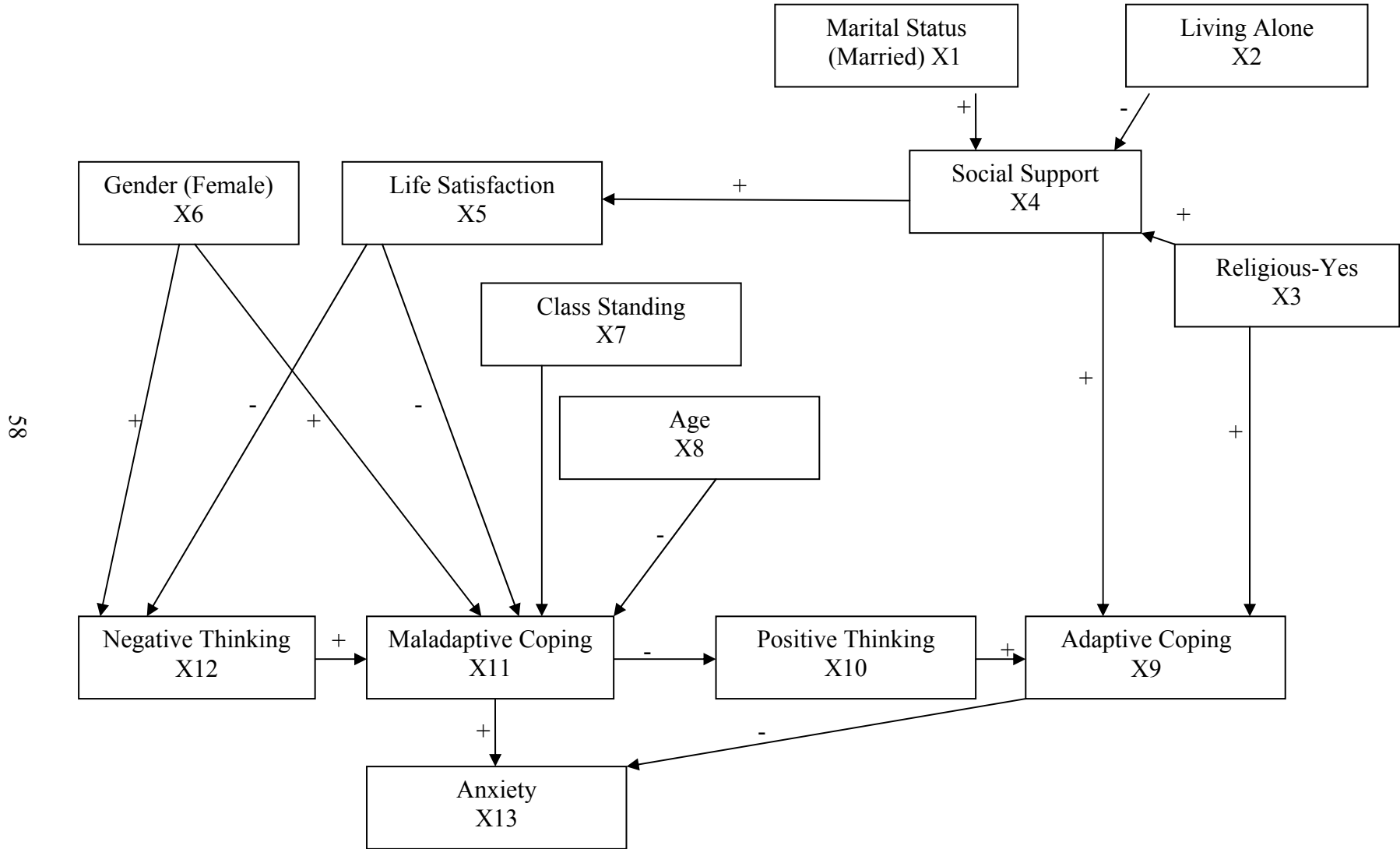
Figure 4.2. Estimated Path Model of Anxiety Response
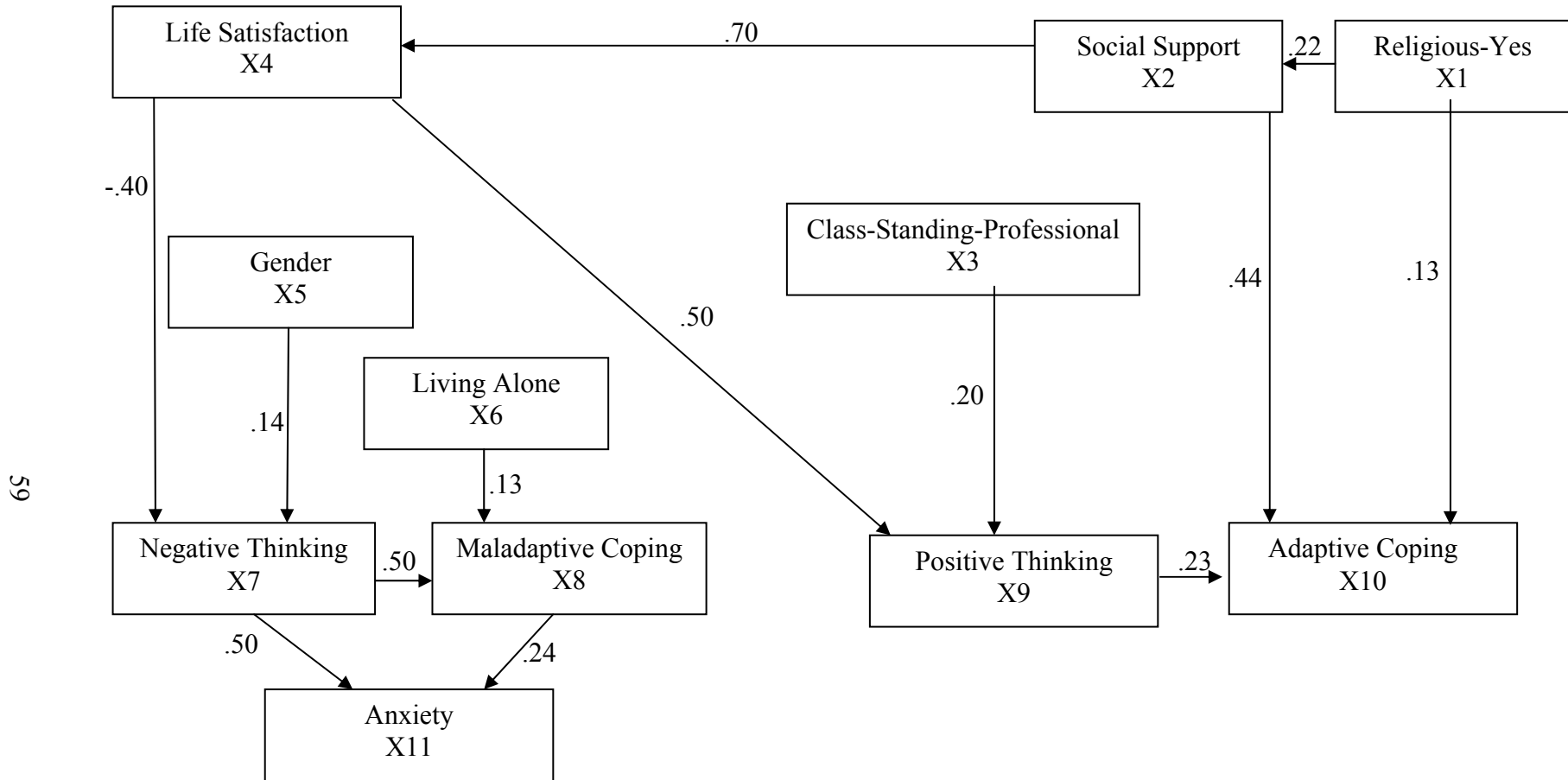
CHAPTER FIVE

Conclusions

Background and Purpose

The overall purpose of this dissertation was to develop an evidence-based theoretical framework for studying the phenomenon of anxiety in young adult college students. Three studies were conducted to achieve this purpose: 1) an evaluation of the psychometric properties of the DASS-21 for measuring anxiety, depression, and stress, in young adult college students; 2) identification of predictors of anxiety and their relative importance in this population, and 3) examination of an integrated hypothetical model of the psychosocial, behavioral, and cognitive dimensions of anxiety in this population.

Young adults have the highest prevalence of anxiety (Kessler, et al., 1994). Untreated anxiety symptoms in this population may lead to mental and physical complications such as pathological anxiety disorders (Emilien, et al., 2002) and heart disease (Kubzansky, et al., 1998). About 50% of anxiety treatment cost is related to inadequate screening and management (Lépine, 2002). The inadequate evaluation of anxiety symptoms can be related to inconsistency in the instruments that are used for measuring anxiety symptoms.

Particularly in this population, further research is needed to investigate whether anxiety and depression are distinctive constructs or if they are sharing the symptoms of negative affectivity (Joiner, 1996). Previous studies among children and adolescents failed to distinguish between anxiety, depression, and stress symptoms using the DASS-21 and suggested that the three-structure definition of these symptoms emerge in the late adolescence and cannot be defined before adulthood (Patrick, et al., 2010). Taking into account that the young college students age group (18 – 24 years) is a transitional stage between adolescent and adulthood (Arnett, 1994, 2001a), it is essential to develop a clear understanding of the structure of these symptoms in this population.

Despite the lack of a unified definition of anxiety in the literature, a wide variety of anxiety management interventions have been proposed, tested, recommended, and implemented in this population. Some researchers used a unidimensional framework as guidance for designing and implementing these interventions. Examples include social support group (Oppenheimer, 1984), which was developed based on the social support

theory (Cohen, et al., 1985), cognitive reappraisal, social skills, and relaxation exercise (Hirokawa, et al., 2002), which was developed based on the transactional model of coping (Lazarus & Folkman, 1996). Other interventions, such as mindfulness meditation, were established based on an integrated theoretical model such as the attention, behavior, cognitive relaxation theory (J. Smith, 1999). However, the mechanism of action of these interventions is still unclear (Shapiro, et al., 2006). Understanding this mechanism depends a great deal on identifying the primary predictors of anxiety and their relative contribution to this phenomenon (Sears & Kraus, 2009). This identification may alter the design and content of proposed interventions to target the factors that are directly related to anxiety for more effective outcome. One suggested method is studying anxiety using a comprehensive multidimensional approach (Jones & Johnston, 2000; Shapiro, et al., 2000).

So far, most of the discussed intervention studies, such as group social support, stress-coping programs, mindfulness meditation, and cognitive therapy (Cukrowicz & Joiner, 2007; Hirokawa, et al., 2002; Jain, et al., 2007; Oppenheimer, 1984; Rosenzweig, Reibel, Greeson, Brainard, & Hojat, 2003; Shapiro, et al., 1998), reported their efficacy in managing college students' anxiety. However, anxiety was measured using one of the following instruments: (1) State-Trait Anxiety Inventory (STAI) (Spielberger, et al., 1970), which was found to overlap with scales that measure depression (Bieling, Antony, & Swinson, 1998; Caci, Baylé, Dossios, Robert, & Boyer, 2003); (2) the Beck Anxiety Inventory (BAI) (Beck & Steer, 1990) which overlap with measures of panic disorders (Cox, Cohen, Direnfeld, & Swinson, 1996); (3) the Profile of Mood States (POMS) (McNair, Lorr, & Droppleman, 1992) which measure symptoms related to tension, uneasiness, shakiness, and restlessness but not the autonomic arousal symptoms of anxiety (Higginson, Fields, Koller, & Tröster, 2001). Thus, it is not clear whether these interventions were effective for managing anxiety, depression, or panic disorders. This discrepancy in defining and measuring anxiety may limit the generalizability and applicability of studies' results and interventions (Buckworth & Dishman, 2002; Hunter, 2004). In turn, the evaluation and management of anxiety in a non-clinical population, such as young adult college students, continues to be an issue of concern for researchers and college health care providers.

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In sum, there are two main obstacles in the available literature that limit evaluating, understanding, and managing college students' anxiety: the inconsistent and overlapping operational definition of anxiety and the use of unidimensional approach for studying anxiety. Accordingly, for better understanding of young adult college students' anxiety in this dissertation, it was critical to first adopt a clear operational definition of anxiety, which distinguishes its defining attributes from those of other overlapping and coexisting constructs such as depression and stress, using the DASS-21. Further, the use of multidimensional approach in this study was essential to (1) explore the psychosocial, behavioral, and cognitive aspects of anxiety; (2) develop a perspective on how certain factors within these aspects are related to each other and to anxiety; and (3) suggest an integrated model for the sequential order of the relationship among these factors and anxiety. This series of investigations will shed the light on the dominant predictors of anxiety that need to be considered in evaluating and managing anxiety in future research.

This chapter provides (a) a summary and synthesis of the main findings of this dissertation studies; (b) comparisons of the current results with previous research; and (c) recommendations and implications for research and practice.

Summary of Findings

Chapter Two is a report of the investigation of DASS-21 psychometric properties. A total of 508 undergraduate students aged 18-24 years completed mailed surveys that included the DASS-21. The exploratory factor analysis supported the 3-dimensional structure of this scale. Cronbach's alphas for the Depression, Anxiety, and Stress subscales were 0.90, 0.83, and 0.86 indicating good internal consistency reliabilities. As hypothesized, depression, anxiety, and stress were positively related to maladaptive coping and negatively related to life-satisfaction providing support for the construct validity of the DASS-21. Overall, findings indicated that the DASS-21 is a reliable and valid instrument for distinguishing between three main constructs, depression, anxiety, and stress in young adult college students. Thus, the DASS-21-A was used for measuring anxiety in this dissertation.

In Chapter Three we examined whether coping style (adaptive and maladaptive), life satisfaction, and selected demographics predicted undergraduate students' depression, anxiety, and stress. A total of 508 undergraduate students aged 18-24 years completed

mailed surveys that included the study measures and a short demographics information questionnaire. Depression, anxiety, and stress were measured using the DASS-21. Coping strategies and life satisfaction were assessed using the Brief COPE Inventory and an adapted version of the Brief Students' Multidimensional Life Satisfaction Scale (BSMLSS). Depression, anxiety, and stress were mainly predicted by maladaptive coping strategies while adaptive coping was not a significant predictor of any of these three constructs. Evaluating and targeting students' maladaptive coping behaviors may promote their mental well-being. Further research is needed to understand the cognitive-behavioral mechanism in students' anxiety

The findings from this study provided guidance for the third study. First, we determined the specific type of maladaptive coping strategies that mainly contributed to anxiety. We conducted the same regression analyses but with the maladaptive coping subcategories (Mahmoud, Staten, & Hall, 2010). We found that anxiety was predicted by certain coping strategies such as self-blaming (negative thought regarding self) and denial (cognitive avoidance) but not by behavioral strategies such as venting and substance use. This finding indicated that it is important to further understand the cognitive aspect of anxiety. Although certain social variables, such as living with someone and belonging to social organization were significantly related to anxiety in the bivariate correlation analysis, they were not significant predictors of anxiety. Based on this finding and others (Caldwell & Reinhart, 1988; Crockett, et al., 2007; Davis, et al., 2003; Eldeleklioglu, 2006; Haemmerlie, et al., 1988), we hypothesized that social support is not directly related to anxiety. Instead, social support might be related to other factors that were found as significant predictors of anxiety in study two, such as life satisfaction (Campbell, et al., 1976).

In Chapter Four, we tested a psychosocial-cognitive-behavioral model of the sequential relationship among demographics, social support, life satisfaction, positive thinking, adaptive coping, negative thinking, maladaptive coping and anxiety. The sequential relationships among these variables were hypothesized based on the literature review and the findings of our earlier studies. A total of 257 undergraduate students aged 18-24 years completed an online survey that included the study measures and a short demographics information questionnaire. The endogenous variables in the model were

measured using the Multidimensional Scale of Perceived Social Support, an adapted version of the BSMLSS, the Brief COPE Inventory, the Positive Automatic Thoughts Questionnaire, and the Cognition Checklist-Anxiety. Anxiety was measured using the Anxiety subscale in the DASS-21. Among all the endogenous variables in the model, only maladaptive coping and negative thinking were directly related to anxiety. Negative thinking was the main predictor of maladaptive coping and anxiety. Thus, it can be suggested that implementing interventions that decrease negative thinking may decrease the use of maladaptive coping strategies and levels of anxiety in young adult college students.

Impact of Dissertation on the State of Knowledge

Despite the wide variety of theory-based interventions that were proposed in the literature for managing anxiety in college students, the prevalence of these symptoms in this population has continued to escalate since 1952 (American College Health Association, 2000, 2009; Twenge, 2000). Using an evidence-based model for defining anxiety and a multidimensional theoretical approach, this dissertation identified factors that are directly related to anxiety and provided direction for designing the interventions that target these factors for better anxiety-management outcome in future research and practice.

Findings from this dissertation add to the science evidence-based definition and explanations of anxiety. Previous studies concluded that the symptoms of depression, anxiety, and stress, as measured by the DASS-21, cannot be distinguished into three main categories in children and adolescents (Patrick, et al., 2010). They suggested that the three-structure character of these psychological distress symptoms emerge in the late adolescence. The current findings support this conclusion in that these symptoms did fall into three main categories in this/late adolescent/young adult college population. The DASS-21 is a valid and reliable instrument for distinguishing between these three constructs which are commonly confused in the literature.

The high correlations and coexistence of anxiety, depression, and stress in this population should not be misinterpreted as an indicator of their unitary structure (Kendall & Watson, 1989). Rather it highlights the importance of evaluating these constructs simultaneously but distinctively. Particularly for experimental studies in this population,

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it would be time and cost effective to investigate the effect of proposed interventions on each of these constructs using the DASS-21.

Second, the study described in Chapter Three was the first to examine how the coping style, as operationally defined as adaptive and maladaptive, is related to anxiety in young adult college students. Most of the previous studies used four categories to define coping: problem-focused, emotion-focused, reactive coping, or avoidant coping (Heppner, et al., 1995; Kariv & Heiman, 2005). We found that, while most of the researchers' and college health professionals' efforts are directed toward developing and testing interventions that help college students cope "adaptively" with anxiety (e.g. Cai, 2000; Godbey & Courage, 1994; Hirokawa, et al., 2002), adaptive coping was not a significant predictor of anxiety. Rather, anxiety was mostly predicted by maladaptive coping. Our findings did not support the negative association between adaptive coping strategies, such as problem-focused, and anxiety proposed by Lazarus and Folkman (1996) theory of coping. Heath care providers need to consider the strong predictive role of maladaptive coping in the students' anxiety. It is essential that any future studies plan to evaluate the effect of certain proposed intervention on anxiety to also examine its effect on coping, both adaptive and maladaptive.

The third study, in Chapter Four, extends past research by developing an integrated model for studying anxiety in young adult college students. This model suggests a sequential order of how psychosocial, behavioral, and cognitive factors are related to each other and to anxiety. The estimated model provides a new insight in how these factors are related to anxiety and proposes propositions that need further investigations. The first proposition is related to the preventive role of social support and positive thinking in anxiety. The model suggests that social support and positive thinking interventions may enhance adaptive coping. With the absence of a path from adaptive coping to anxiety, it can be hypothesized that adaptive coping may have a preventive role in young adult college students' anxiety. However, further investigation for this role is recommended.

The included studies have some limitations such as using a cross-sectional descriptive design which may limit establishing causality. The low response rate in the third study is another limitation. Although the study sample was randomly selected, there

were too few freshmen and sophomores to include these groups in the analysis. This limited the comparison of anxiety levels across the class-standing to those in the upper-classes. Future validation studies using larger sample size with a representative class distribution and a longitudinal prospective design may help validate the integrated model.

Despite the small sample size in the third study ($N = 257$), the findings were consistent with those in the second study in describing how coping style is related to anxiety. These two studies helped clarify the incongruity in the literature regarding a meaningful classification of the coping styles (Parker & Endler, 1992) and how they are related to students' anxiety and other related constructs such as depression and stress. The discrepancy regarding the classification of some of coping strategies, such as the emotion-focused strategies, as adaptive/effective or maladaptive/ineffective (Lazarus & Folkman, 1996; Snyder & Lopez, 2002), resulted in inconclusive pattern of results with regard to their role in the adaptation process and their relationship with anxiety.

Using the Carver's (1989) operational definition of adaptive and maladaptive coping through these dissertation studies have added some clarity to the relations of coping and anxiety. Further examination of the adaptive aspect of emotion-focused and problem-focused coping strategies in relation to students' anxiety is recommended.

Recommendations for Nursing Practice and Research

The current findings suggest that young adult college students' anxiety is mainly predicted by negative thinking and maladaptive coping. If the estimated model is further validated in future studies it will provide important guidance for developing and evaluating evidence-based interventions for preventing and managing anxiety in this population.

Screening for anxiety and other coexisting symptoms need to be included in the pre-college-admission health screening policy to provide a baseline assessment followed-up through annual screening. The DASS-21 is recommended as the method of choice for this purpose. It is also recommended that college counselors and health care providers conduct comprehensive assessment of the cognitive and behavioral coping of students who present with anxiety symptoms. Encouraging students to describe how their thoughts and behaviors interact with their feelings may help develop a care plan that targets the anxiety-triggering thoughts and behaviors.

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This dissertation provides guidance for my future research plan. My next step will be to further validate the operational definition of coping strategies as adaptive and maladaptive through psychometric study of the Brief COPE Inventory (Carver, 1997) using the data collected from Study Two ($N = 508$) and Three ($N = 257$). Second, the use of an online survey may have contributed to the low response rate and small sample size (Sax, et al., 2003) in study three. Thus, I will conduct a validation study of the estimated model using the paper-and-pencil survey method and a larger sample size that includes students from different class-standing categories and age subgroups for better generalizability.

Third, I plan to conduct a randomized controlled trial to investigate the effect of cognition-restructuring strategies, such as cognitive-behavior therapy, on negative thinking, maladaptive coping, and anxiety.

Using data from this clinical trial, secondary analysis can be conducted to test for certain propositions in the estimated model. Using the method of Judd and Kenny (1981) to test for mediation in intervention studies, I will investigate whether negative thinking mediates the relationship between cognitive behavior therapy and anxiety. For this purpose, the independent variable (cognitive behavior therapy) can be considered as a binary variable. I will also investigate whether maladaptive coping mediates the relationship between the intervention and anxiety. This strategy may help investigating if negative thinking leads to anxiety or if maladaptive coping leads to anxiety or if both may lead to anxiety.

Appendix A

Study One and Two Questionnaire

UNIVERSITY OF KENTUCKY

COLLEGE STUDENT HEALTH AND WELL BEING

For the questions below, please circle the number of the answer or write in your answer in the space provided, whichever applies. PLEASE CIRCLE ONLY ONE.
This set of questions asks about sleep habits.

1. How long does it usually take you to fall asleep?	__ __ Minutes
2. On a typical <u>week</u> night	a. I go to bed at: _____ O'clock (AM Or PM) (**Circle one**) b. And get up at: _____ O'clock (AM Or PM)
3. On a typical <u>weekend</u> night	a. I go to bed at: _____ O'clock (AM Or PM) (**Circle one**) b. And get up at: _____ O'clock (AM Or PM)
4. Which of the following best describes your bedtime pattern over the course of a typical week?	a. Within 30 minutes of the same time every night b. Within 30-60 minutes of the same time every night c. Between 1 and 2 hours of the same time every night d. More than two hours different from night to night
5. How many TOTAL HOURS of **NAPS** do you take each week?	_____ Hours

6. When you are trying to sleep, HOW OFTEN do you:	Never or Rarely	Some times	A lot of the time	Most of the time
a. Experience a restless, "creepy-crawly" feeling in your legs that makes you feel like you just have to move them?	1	2	3	4
b. Snore loudly enough to bother other people?	1	2	3	4
c. Make gasping or snorting sounds while sleeping?	1	2	3	4
d. Twitch or kick during the night while sleeping	1	2	3	4
e. Wake up and can't go back to sleep	1	2	3	4
f. Wake up more than 3 times a night	1	2	3	4
g. Wake up from sleep feeling paralyzed	1	2	3	4
h. See, hear, or feel disturbing things when you are falling asleep	1	2	3	4
i. Feel very tired when you wake up in the morning	1	2	3	4
j. Feel your muscles get very weak when you are laughing, excited, or angry	1	2	3	4

Appendix A (Continued)

7. How likely are you to doze off or fall asleep in the following situations, in contrast to just feeling tired? Even if you haven't done some of these activities recently, think about how they would have affected you.
Use this scale to choose the most appropriate number for each situation:
0 = would never doze 1 = slight chance of dozing 2 = moderate chance of dozing 3 = high chance of dozing. Please circle one number for each of the 8 situations.

Situation	Never	Slight	Moderate	High
a. Sitting and reading	0	1	2	3
b. Watching television	0	1	2	3
c. Sitting inactive in a public place, for example a theatre or meeting	0	1	2	3
d. As a passenger in a car for an hour without a break	0	1	2	3
e. Lying down to rest in the afternoon	0	1	2	3
f. Sitting and talking to someone	0	1	2	3
g. Sitting quietly after lunch (when you've had no alcohol)	0	1	2	3
h. In a car, while stopped in traffic	0	1	2	3

The next questions ask about physical activity.

1. During the past 7 days on how many days did you engage in the following physical activity?	
2. Exercised or participated in sports activities for at least 20 minutes that made you sweat and breathe hard, such as basketball, jogging, swimming laps, tennis, fast bicycling, or similar aerobic activities?	_____Days
3. Performed stretching exercises, such as toe touching, knee bending, or leg stretching?	_____Days
4. Exercised to strengthen or tone, such as pushups, sit ups, or weight lifting?	_____Days
5. Walked or biked for at least 30 minutes at a time? Including walking or bicycling to or from class or work?	_____Days
6. During the past 12 months, were you a member of an intercollegiate athletic team?	1. Yes 2. No
7. During the past 12 months, were you a member of an intramural athletic team or club?	1. Yes 2. No

The next set of questions ask about your nutrition.
The following question asks about the food you ate during the past two days. Think about all the meals and snacks you ate from the time you got up until you went to bed. Be sure to include food you ate at home, on campus, at restaurants, or anywhere else.

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Appendix A (Continued)

8. During the past two days, how many times did you eat food from the following food categories?	Number of times in past 2 days
a. Fruit	_____ times in past 2 days
b. 100% fruit juice	_____ times in past 2 days
c. Green salad	_____ times in past 2 days
d. Cooked or raw vegetables, excluding in a green salad	_____ times in past 2 days
e. Hamburger, hot dogs, or sausage, fried chicken, pizza	_____ times in past 2 days
f. French fries or potato chips	_____ times in past 2 days
g. Candy bars, cookies, donuts, pie, or cake	_____ times in past 2 days

The following questions ask about specific body measurements.

9. What is your height?	_____ ft _____ in	_____ don't know
10. What is your weight?	_____ pounds	_____ don't know
11. What is your cholesterol level?	_____ Total Cholesterol level _____ don't know _____ HDL (good) _____ don't know _____ LDL (bad) _____ don't know	
12. What is your blood pressure?	Upper number _____ _____ don't know Lower number _____ _____ don't know	

The following questions ask about body weight and eating patterns.

13. How often are you dieting?	never	rarely	sometimes	often	always
14. What is the maximum amount of weight (in pounds) that you have ever lost within 1 month?	0-4	5-9	10-14	15-19	20
15. What is your maximum weight gain within a week?	0-1	1.1-2	2.1-3	3.1-5	5.1+
16. In a typical week, how much does your weight fluctuate?	0-1	1.1-2	2.1-3	3.1-5	5.1+
17. Would a weight fluctuation of 5 lbs. affect the way you live your life?	not at all	slightly	moderately	very much	
18. Do you eat sensibly in front of others and splurge alone?	never	rarely	often	always	
19. Do you give too much time and thought to food?	never	rarely	often	always	
20. Do you have feelings of guilt after overeating?	never	rarely	often	always	
21. How conscious are you of what you're eating?	not at all	slightly	moderately	extremely	

Appendix A (Continued)

22. How many pounds over your desired weight were you at your maximum weight?	0-1	1-5	6-10	11-20	21+

The next questions ask about tobacco use.

23. How old were you when you smoked a whole cigarette for the first time?	a. Never smoked b. 13 years old or younger c. 14 or 15 years old d. 16 or 17 years old e. 18 to 20 years old f. 21 to 24 years old g. 25 years old or older
24. During the past 30 days, on how many days did you smoke cigarettes?	a. 0 days b. 1 or 2 days c. 3 to 5 days d. 6 to 9 days e. 10 to 19 days f. 20 to 29 days g. All 30 days.
25. During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?	a. Did not smoke in the past 30 days b. Less than 1 cigarette per day c. 1 cigarette per day d. 2 to 5 cigarettes per day e. 6 to 10 cigarettes per day f. 11 to 20 cigarettes per day g. More than 20 cigarettes per day
26. Have you ever smoked cigarettes regularly, that is, at least one cigarette every day for 30 days?	a. Yes b. No
27. Do you plan to quit smoking?	a. Do not smoke cigarettes b. Yes, within next 30 days c. No, don't plan to quit within next 6 months.
28. During the past 30 days, on how many days did you smoke a pipe, cigar, or other tobacco products (not including cigarettes)?	_____Number of days smoked in past 30 days _____I did not smoke in past 30 days
29. During the past 30 days, on how many days did you use spit tobacco, chewing tobacco or snuff?	_____Number of days use these products in past 30 days _____I did not use these products in past 30 days

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Appendix A (Continued)

The next set of questions relate to smoke-free environments and tobacco marketing.

30. How important is it to you to have a smoke-free environment inside all campus buildings including dormitories? Is it very important, somewhat important, not too important or not at all important?	a. Very important b. Somewhat important c. Not too important d. Not important at all e. Don't know
31. How has the smoke-free law in Lexington affected your motivation to quit smoking tobacco products? Has the law increased, decreased, or not affected your motivation to quit?	a. Increase b. No effect c. Decrease d. I have never smoked tobacco
32. How has the smoke-free law in Lexington affected the number of cigarettes or other tobacco products that you smoke during the day? Has the law increased, decreased, or not affected the number of cigarettes or other tobacco products you smoke every day?	a. Increase b. No effect c. Decrease d. I have never smoked tobacco
33. How has the smoke-free law in Lexington affected how often you frequent bars? Has the law increased, decreased, or not affected how often you visit bars?	a. Increase b. No effect c. Decrease d. I have never gone to a Lexington bar
34. During the **past 30 days**, how many times have you been out to a nightclub or bar?	_____ times out to nightclub or bar
35. How many times have you seen tobacco marketers (cigarette girls/guys) giving away free items in LEXINGTON nightclubs and bars during the past school year?	a. Never b. Rarely c. Occasionally d. Frequently e. I have never gone to a Lexington bar
36. How many times have you seen tobacco marketers (cigarette girls/guys) giving away free items in OTHER CITIES' nightclubs and bars during the past school year?	a. Never b. Rarely c. Occasionally d. Frequently e. I have never gone to a bar in another city

Appendix A (Continued)

37. Please mark the answer that best describes your experience with tobacco smoke in your past and/or present work settings:	a. I have had at least one work setting that was not smoke free and I believe the smoke had negative effects on my health. b. I have had at least one work setting that was not smoke free and I believe the smoke did not have negative effects on my health. c. All of my work settings have been smoke-free. d. I have had no experience in a work environment.

The next questions ask about drinking alcohol. For these questions one drink = beer (12 oz.), wine (4 oz.), wine coolers (12 oz.), and liquor (1 oz. shot) such as rum, gin, vodka, or whiskey. For these questions, drinking alcohol does not include drinking a few sips of wine for religious purposes.

38. How old were you when you had your first drink of alcohol other than a few sips?	a. Never drank alcohol b. 13 years old or younger c. 14 or 15 years old d. 16 or 17 years old e. 18 to 20 years old f. 21 to 24 years old g. 25 years old or older

39. During the past 30 days, on how many days did you engage in the following: (Circle the number that corresponds to the number of days.)	0 Days	1-2 Days	3-5 Days	6-9 Days	10-19 Days	20-30 Days
a. Had at least one drink of alcohol	1	2	3	4	5	6
b. Had five or more drinks of alcohol in a setting	1	2	3	4	5	6
c. Drank enough to get drunk—unsteady, dizzy or sick to your stomach, or passed out or blacked out—	1	2	3	4	5	6
d. Drank rapidly: shooting beers, funneling, or 4 + shots per hour?	1	2	3	4	5	6

40. Think back over the **past two weeks**. How many times did you have 5 or more drinks at one sitting? _____**times**
41. What percent of students on campus do you think drank 5 or more drinks at one sitting in the past two weeks?   _____**%**

Appendix A (Continued)

42. Which best describes when you most recently experienced the following at least once due to your drinking.	In Past Two Weeks	In Past 30 days	In Past 12 Months	Never
a. Performed poorly on a test or important project	1	2	3	4
b. Been in trouble with police, residence hall, or other college authorities	1	2	3	4
c. Got into a fight or argument	1	2	3	4
d. Drove a car while under the influence	1	2	3	4
43. Which best describes when you most recently experienced the following at least once due to your drinking.	In Past Two Weeks	In Past 30 days	In Past 12 Months	Never
a. Missed a class	1	2	3	4
b. Was criticized by someone you know	1	2	3	4
c. Thought you might have a drinking problem	1	2	3	4
d. Had a memory loss	1	2	3	4
e. Did something you later regretted	1	2	3	4
f. Was taken advantage of sexually	1	2	3	4
g. Took advantage of another sexually	1	2	3	4
h. Tried unsuccessfully to cut down or stop	1	2	3	4
i. Was hurt or injured	1	2	3	4

The next questions ask about marijuana and other drug use. Examples are given for each drug group. These are merely examples and may not include all drugs that are within that drug category. If you have used any drug that applies to that drug category, please indicate your use. For each drug that you have used, indicate the age at which you first used the drug. Circle the number that indicates your use over the past 12 months and past 30 days. If you have never used the drug, circle never used.

44. Type of Drug	Age at first use	Used in 30 days	Used in past 12 months	Never Used
a. Marijuana, including THC Hashish	____	2	1	0

Appendix A (Continued)

b. Cocaine, including crack	____	2	1	0
c. Methamphetamine	____	2	1	0
d. Illegal drugs including LSD, PCP, mescaline, mushrooms, ecstacy, speed, ice, or heroin	____	2	1	0
f. Anabolic steroids without a doctors prescription	____	2	1	0
g. Inhalants including, glue, contents of aerosol spray cans, paints or sprays	____	2	1	0
h. Prescription drugs not as ordered by a physician including: OxyContin Vicodin Sedatives Amphetamines (for example, Ritalin or Adderal)	____ ____ ____ ____	2 2 2 2	1 1 1 1	0 0 0 0
i. Over-the-counter medicines for the purpose of getting high.	____	2	1	0

The next set of questions asks about your sexual behavior. For purposes of this study, sexual intercourse is defined as vaginal intercourse, anal intercourse, or oral/genital sex.

45. During the **past 30 days**, how frequently did you or your partner use a condom/dental dam during **vaginal intercourse**?	a. No vaginal intercourse in past 30 days b. Never used a condom c. Rarely used a condom d. Sometimes used a condom e. Most of the time used a condom f. Always used a condom
46. During the **past 30 days**, how frequently did you or your partner use a condom/dental dam during **anal intercourse**?	a. No anal intercourse in past 30 days b. Never used a condom c. Rarely used a condom d. Sometimes used a condom e. Most of the time used a condom f. Always used a condom
47. During the **past 30 days**, how frequently did you or your partner use a condom/dental dam during **oral intercourse**?	a. No oral intercourse in past 30 days b. Never used a condom c. Rarely used a condom d. Sometimes used a condom e. Most of the time used a condom f. Always used a condom

Appendix A (Continued)

48. During the past 30 days, how often did you drink alcohol or use drugs before you had sexual intercourse?	a. No sexual intercourse in past 30 days b. Never c. 1 time d. 2 or 3 times e. 4 to 9 times f. 10-19 times g. 20 or more times
49. In the past 3 months, how many people have you had vaginal or anal sex with females or males?	_____number of females _____number of males
50. In the past 3 months, how many times have you had vaginal or anal sex with females or males?	_____Times with females _____ Times with males
51. In the **past 3 months**, when you had **penile-vaginal** intercourse (penis in vagina), which form(s) of <u>contraception or protection</u> did you or your sexual partner(s) use? (**Mark <u>out of</u> that apply**):	a.____ No penile-vaginal sex in past 3 months b.____ No method c.____ Not sure d.____ Condom for males e.____ Female condom (vaginal pouch) f.____ Withdrawal ('pull-out') g.____ Patch h.____ Pill i.____ Vaginal ring j.____ Depo-Provera (injection) or Norplant (implant) k.____ Diaphragm l.____ Emergency contraceptive pill m.___ Spermicidal (over-the-counter sperm killer) n.____ IUD (intrauterine device) o.____ Rhythm Methods (Natural Family Planning) p.____ I do not know whether my partner used contraception (birth control)
52. Which best describes the most recent time that you have been tested for HIV/AIDS?	a. I have never been tested b. I have been tested within the past 12 months. c. I have been tested but not within the past 12 months. d. Not sure

Appendix A (Continued)

53. How many times (in the past 12 months and total) have you unintentionally been pregnant or gotten someone pregnant?	_____Times past 12 months _____Times total
54. Have you or any of your partners ever had an abortion?	a. Yes b. No c. Not sure

This set of questions asks about safety practices.

55. During the **past 30 days**, how many times did you ride in a car or other vehicle driven by someone else who had been drinking alcohol?	a. 0 times b. 1 time c. 2 or 3 times d. 4 or 5 times e. 6 or more times
56. During the past **30 days**, how many times did you drive a car or other vehicle when you had been drinking alcohol?	a. 0 times b. 1 time c. 2 or 3 times d. 4 or 5 times e. 6 or more times
57. During the **past 30 days**, on how many days did you carry a gun? Do not count carrying a gun as part of your job.	a. 0 days b. 1 day c. 2 or 3 days d. 4 or 5 days e. 6 or more days
58. During the past 12 months, how many times were you in a physical fight?	a. 0 times b. 1 time c. 2 or 3 times d. 4 or 5 times e. 6 or 7 times f. 8 or 9 times g. 10 or 11 times h. 12 or more times
59. During the **past 12 months**, with who did you physically fight? (**Circle all that apply**.)	a. A total stranger b. A friend or someone I know c. A boyfriend, girlfriend, or date d. My spouse or live-in boyfriend/girlfriend e. A parent, brother, sister, or other family member f. Other _____
60. During the **past 12 months**, how many times were you in a physical fight in which you were injured and treated by a doctor or nurse?	a. 0 times b. 1 time c. 2 or 3 times d. 4 or 5 times e. 6 or more times

Appendix A (Continued)

61. During the **past 12 months**, have you experienced any of the following? (**Circle all that apply**.)	a. Verbal threats, pressure, or coercion for sex against your will b. Sexual touching against your will c. Attempted sexual penetration (vaginal, anal, oral intercourse) against your will d. Sexual penetration (vaginal, anal, oral intercourse) against your will e. I have not experienced any of these

62. The next questions ask about emotional health in THE PAST SEVEN DAYS. Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement. *The rating scale is as follows:*
0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

	0	1	2	3
a- I found it hard to unwind.	0	1	2	3
b- I was aware of dryness of my mouth.	0	1	2	3
c- I couldn't seem to experience any positive feeling at all.	0	1	2	3
d- I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion).	0	1	2	3
e- I found it difficult to work up the initiative to do things.	0	1	2	3
f- I tended to over-react to situations.	0	1	2	3
g- I experienced trembling (e.g., In the hands).	0	1	2	3
h- I felt that I was using a lot of nervous energy.	0	1	2	3
i- I was worried about situations in which I might panic and make a fool of myself.	0	1	2	3
j- I felt that I had nothing to look forward to.	0	1	2	3
k- I found myself getting agitated.	0	1	2	3
l- I found it difficult to relax.	0	1	2	3
m- I felt down-hearted and blue.	0	1	2	3
n- I was intolerant of anything that kept me from getting on with what I was doing.	0	1	2	3
o- I felt I was close to panic.	0	1	2	3
p- I was unable to become enthusiastic about anything.	0	1	2	3
q- I felt I wasn't worth much as a person.	0	1	2	3
r- I felt that I was rather touchy.	0	1	2	3
s- I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
t- I felt scared without any good reason.	0	1	2	3
u- I felt that life was meaningless.	0	1	2	3

Appendix A (Continued)

Sometimes people feel so depressed and hopeless about the future that they may consider attempting suicide that is, taking some action to end their own life. The next questions ask about suicide.

63. During the past 12 months, did you ever seriously consider attempting suicide?	a. Yes b. No
64. During the past 12 months, did you make a plan about how you would attempt suicide?	a. Yes b. No
65. During the past 12 months, did you actually attempt suicide?	a. Yes b. No

This set of questions gets at how you generally deal with the situations that arise in your life.

75. Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you *OVER THE PAST WEEK*. There is no right or wrong answers. Do not spend too much time on any statement. The rating scale is as follows:
0   I don't usually do this at all
1   I usually do this a little bit
2   I usually do this a medium amount
3   I usually do this a lot

OVER THE PAST WEEK	0	1	2	3
a. I turn to work or other activities to take my mind off things.	0	1	2	3
b. I concentrate my efforts on doing something about the situation I'm in.	0	1	2	3
c. I say to myself "this isn't real".	0	1	2	3
d. I use alcohol or other drugs to make myself feel better.	0	1	2	3
e. I get emotional support from others.	0	1	2	3
f. I give up trying to deal with it.	0	1	2	3
g. I take action to try to make the situation better.	0	1	2	3
h. I refuse to believe it is happening.	0	1	2	3
i. I say things to let my unpleasant feelings escape.	0	1	2	3
j. I get help and advice from other people.	0	1	2	3
k. I use alcohol or drugs to help me get through it.	0	1	2	3
l. I try to see it in a different light, to make it seem more positive.	0	1	2	3
m. I criticize myself.	0	1	2	3
n. I try to come up with a strategy about what to do.	0	1	2	3
o. I get comfort and understanding from someone.	0	1	2	3
p. I give up attempting to cope.	0	1	2	3

Appendix A (Continued)

q. I look for something good in what is happening.	0	1	2	3
r. I make jokes about it.	0	1	2	3
s. I do something to think about it less, such as going to the movies, watching TV, reading, day dreaming, sleep, or shopping.	0	1	2	3
t. I accept the reality of the fact that it is happening.	0	1	2	3
u. I express my negative feelings.	0	1	2	3
v. I try to find comfort in my religion or spiritual beliefs.	0	1	2	3
w. I try to get advice from other people about what to do.	0	1	2	3
x. I learn to live with it.	0	1	2	3
y. I think hard about what steps to take.	0	1	2	3
z. I blame myself for things that happen.	0	1	2	3
z.a. I pray or meditate.	0	1	2	3
z.b. I make fun of the situation.	0	1	2	3

67. I am currently taking prescribed medication for depression, anxiety, or other emotional problem.	a. Yes b. No c. Not sure

68. Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle SA. If you agree with the statement, circle A. If you disagree, circle D. If you strongly disagree, circle SD.

a. On the whole, I am satisfied with my life.	SA	A	D	SD
b. At, times I think I am no good at all.	SA	A	D	SD
c. I feel that I have a number of good qualities.	SA	A	D	SD
d. I am able to do things as well as most other people.	SA	A	D	SD
e. I feel l do not have much to be proud of.	SA	A	D	SD
f. I certainly feel useless at times.	SA	A	D	SD
g. I feel that I'm a person of worth, at least on an equal plane with others.	SA	A	D	SD
h. I wish I could have more respect for myself.	SA	A	D	SD
i. All in all, I am inclined to feel that I am a failure.	SA	A	D	SD
j. I take a positive attitude toward myself.	SA	A	D	SD

The next set of questions asks about your satisfaction with various aspects of your life. Please circle the number on the word that best describes your satisfaction with each area.

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Appendix A (Continued)

69. I would describe my satisfaction with	Terrible	Unhappy	Mostly Dissatisfied	Mixed	Mostly Satisfied	Pleased	Delighted	Does Not Apply
a. My childhood as:	1	2	3	4	5	6	7	9
b. My current family life as:	1	2	3	4	5	6	7	9
c. My experience at the University of Kentucky as:	1	2	3	4	5	6	7	9
d. My friendships as:	1	2	3	4	5	6	7	9
e. Where I live as:	1	2	3	4	5	6	7	9
f. My relationship with a significant other as:	1	2	3	4	5	6	7	9
g. My work for pay as:	1	2	3	4	5	6	7	9
h. My social life as:	1	2	3	4	5	6	7	9
i. My academic life as:	1	2	3	4	5	6	7	9
j. My extracurricular activities as:	1	2	3	4	5	6	7	9
k. My financial situation as:	1	2	3	4	5	6	7	9

The next set of questions is about your perceptions of your general emotional and physical health during the past 30 days.

70. Would you say that in general your health is:	Excellent	Very Good	Good	Fair	Poor	Don't Know
	1	2	3	4	5	6

71. Please write in the number of days for each question.

a. Now thinking about your physical health, which includes physical illness or injury, for how many days during the **past 30 days** was your physical health not good?	____Number of Days
b. Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the **past 30 days** was your mental health not good?	____Number of Days
c. During the **past 30 days**, for about how many days did poor mental or physical health keep you from doing your usual activities, such as self-care, work/school, and recreation?	____Number of Days
d. During the **past 30 days**, for about how many days did PAIN make it hard for you to do your usual activities, such as self-care, work, or recreation?	____Number of Days
e. During the **past 30 days**, for about how many days have you felt SAD, BLUE, or DEPRESSED?	____Number of Days

Appendix A (Continued)

f. During the **past 30 days**, for about how many days have you felt WORRIED, TENSE, or ANXIOUS?	____Number of Days
g. During the **past 30 days**, for about how many days have you felt you did NOT get ENOUGH REST or SLEEP?	____Number of Days
h. During the **past 30 days**, for about how many days have you felt VERY HEALTHY AND FULL OF ENERGY?	____Number of Days

For the questions below, please circle the number of the answer or write in your answer in the space provided, whichever applies.

72. How old are you?	_____years
73. What is your gender?	a. Female b. Male
74. How do you describe your race?	a. White – not Hispanic b. Black – not Hispanic c. Hispanic or Latino d. Asian or Pacific Islander e. Other (specify): _____
75. Which best describes you?	a. Heterosexual (straight) b. Gay or lesbian c. Bisexual d. Not sure
76. Which best describes your parents' marital status?	a. Never married to each other. b. Married c. Divorced d. Widowed _____
77. Which best describes your mother's level of education?	a. Did not complete high school. b. High school c. Some college or post secondary education d. College degree e. Post bachelors degree
78. Which best describes your father's level of education?	a. Did not complete high school. b. High school c. Some college or post secondary education d. College degree e. Post bachelors degree
79. Do you have health insurance?	a. Yes b. No c. I'm not sure

Appendix A (Continued)

80. What best describes your spiritual or religious involvement?	a. I am neither spiritual nor religious. b. I am spiritual, but not religious. c. I am religious, but do not participate in a specific religious group. d. I attend religious services occasionally. e. I attend religious services at least monthly. f. I attend religious services weekly.
81. With whom do you currently live? (Select all that apply.)	a. Alone b. Spouse/boyfriend/girlfriend/partner c. Roommate(s)/friend(s) d. Parent(s)/guardian(s) e. Other relatives f. Your children 7. Other
82. Where do you currently live?	a. Residence hall b. Fraternity or sorority house c. Other university/college housing d. Off-campus house or apartment e. Parent/guardian's home f. Other
83. Are you a member of a social fraternity or sorority?	a. Yes b. No
84. Please provide the following information regarding your computer on average per day.	_____Usual number of minutes per day using the computer _____ minutes using computer for school work _____ minutes using the computer to surf for general purpose _____ minutes using computer to chat, email, connect with friends and family _____ minutes chatting, gaming, gambling, or other activities not involving friends or family _____ minutes in other computer use
85. Please indicate the average number of hours **per week** that you play video games.	_____Hours playing video games
86. Please indicate the average number of hours **per week** that you watch TV	_____Hours watching television
87. What is your class standing?	a. Freshman b. Sophomore

Appendix A (Continued)

	c. Junior d. Senior e. Graduate student/Professional student
88. Which college within the University are you enrolled? i.e. Arts and Science, Education, Business, Engineering, Nursing, Agriculture, Communication, Design, Social Work, Allied Health, Pharmacy, Public Health, Medicine, Dentistry, Law	_____Current college enrollment
89. Please indicate number of credits for current (Spring 2007) semester.	a. My overall GPA is_____. b. My Fall 2006 GPA was_____. c. In Fall 2006 I attempted _____credits. d. In Fall 2006 I received _____credits. e. In Fall 2006 I received a failing grade in _____credits. f. In Fall 2006 I withdrew from _____credits. g. I was not enrolled in Fall 2006.

90. The Genesis message at UK is:	1. This is only the beginning, not the end.
	2. Be fun, Be safe, Be Responsible.
	3. The end is near, live for today.
	4. Change is within you, Do it now.
	5. I am not aware of Genesis.

Please use this space to let us know about other health concerns or situations that may affect your success in college.

Thank you for participating in this study. Your time and effort will help in developing health programs for college students.

Study Three Questionnaire

UNIVERSITY OF KENTUCKY

Listed below are a variety of thoughts that pop into people's heads. Please read each thought and indicate how frequently, if at all, the thought occurred to you over the last week. Please read each item carefully and fill in the blank with the appropriate number; using the following scale:

1= Never, 2 = sometimes, 3 = moderately often, 4 = Often, 5 = All the time					
1.	I am respected by my peers.	1	2	3	4	5
2.	I have a good sense of humor.	1	2	3	4	5
3.	My future looks bright.	1	2	3	4	5
4.	I will be successful.	1	2	3	4	5
5.	I am fun to be with.	1	2	3	4	5
6.	I am in a great mood.	1	2	3	4	5
7.	There are many people who care about me.	1	2	3	4	5
8.	I am proud of my accomplishments.	1	2	3	4	5
9.	I will finish what I start.	1	2	3	4	5
10.	I have many good qualities.	1	2	3	4	5
11.	I am comfortable with life.	1	2	3	4	5
12.	I have a good way with others.	1	2	3	4	5
13.	I am a lucky person.	1	2	3	4	5
14.	I have friends who support me.	1	2	3	4	5
15.	Life is exciting.	1	2	3	4	5
16.	I enjoy challenge.	1	2	3	4	5
17.	My social life is terrific.	1	2	3	4	5
18.	There is nothing to worry about.	1	2	3	4	5
19.	I am so relaxed.	1	2	3	4	5
20	My life is running smoothly.	1	2	3	4	5
21	I am happy with the way I look.	1	2	3	4	5
22	I take good care of myself.	1	2	3	4	5
23	I deserve the best in life.	1	2	3	4	5
24	Bad days are rare.	1	2	3	4	5
25	I have many useful qualities.	1	2	3	4	5
26	There is no problem that is hopeless.	1	2	3	4	5
27	I won't give up.	1	2	3	4	5
28	I state my opinions with confidence.	1	2	3	4	5
29	My life keeps getting better.	1	2	3	4	5
30	Today, I have a accomplished a lot.	1	2	3	4	5

Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you over the past week. There is no right or wrong answer. Do not spend too much time on any statement. The rating scale is as follows:

Appendix B (Continued)

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1.	I found it hard to unwind.	0	1	2	3
2.	I was aware of dryness of my mouth.	0	1	2	3
3.	I couldn't seem to experience any positive feeling at all.	0	1	2	3
4.	I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion).	0	1	2	3
5.	I found it difficult to work up the initiative to do things.	0	1	2	3
6.	I tended to over-react to situations.	0	1	2	3
7.	I experienced trembling (e.g., In the hands).	0	1	2	3
8.	I felt that I was using a lot of nervous energy.	0	1	2	3
9.	I was worried about situations in which I might panic and make a fool of myself.	0	1	2	3
10.	I felt that I had nothing to look forward to.	0	1	2	3
11.	I found myself getting agitated.	0	1	2	3
12.	I found it difficult to relax.	0	1	2	3
13.	I felt down-hearted and blue.	0	1	2	3
14.	I was intolerant of anything that kept me from getting on with what I was doing.	0	1	2	3
15.	I felt I was close to panic.	0	1	2	3
16.	I was unable to become enthusiastic about anything.	0	1	2	3
17.	I felt I wasn't worth much as a person.	0	1	2	3
18.	I felt that I was rather touchy.	0	1	2	3
19.	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20.	I felt scared without any good reason.	0	1	2	3
21.	I felt that life was meaningless.	0	1	2	3

In a list of statements below, you may find some statements which almost always come into your mind and other statements which almost never occur to you. Read each statement carefully and indicate how frequently you think this thought or a thought similar to it.

0 = never, 1 = almost never, 2 = sometimes, 3 = often, 4 = always						
1.	I am a social failure.	0	1	2	3	4
2.	I will never be good as other people are.	0	1	2	3	4
3.	People don't respect me anymore.	0	1	2	3	4
4.	No one cares whether I live or die.	0	1	2	3	4
5.	I'm worse off than they are.	0	1	2	3	4
6.	I don't deserve to be loved.	0	1	2	3	4
7.	I've lost the only friends I've had.	0	1	2	3	4

Appendix B (Continued)

8.	I'm not worthy of people's attention or affection.	0	1	2	3	4
9.	There's no one left to help me.	0	1	2	3	4
10.	What if I get sick and become an invalid?	0	1	2	3	4
11.	Something might be happening that will ruin my appearance.	0	1	2	3	4
12.	I am going to be injured.	0	1	2	3	4
13.	What if no one reaches me in time to help?	0	1	2	3	4
14.	I'm going to have an accident.	0	1	2	3	4
15.	I might be trapped.	0	1	2	3	4
16.	I am not a healthy person.	0	1	2	3	4
17.	There's something very wrong with me.	0	1	2	3	4
18.	Life isn't worth living.	0	1	2	3	4
19.	I'm worthless.	0	1	2	3	4
20	I have become physically unattractive.	0	1	2	3	4
21	I will never overcome my problems.	0	1	2	3	4
22	Something awful is going to happen.	0	1	2	3	4
23	I'm going to have a heart attack.	0	1	2	3	4
24	I'm losing my mind.	0	1	2	3	4
25	Something will happen to someone I care about.	0	1	2	3	4
26	Nothing ever works out for me anymore.	0	1	2	3	4

Rate each of the following statements on a scale of 1 ("not at all typical of me") to 5 ("very typical of me"). Please do not leave any items blank.

Not at all typical of me				Very typical of me
1	2	3	4	5

1.	If I do not have enough time to do everything, I do not worry about it.	1	2	3	4	5
2.	My worries overwhelm me.	1	2	3	4	5
3.	I do not tend to worry about things.	1	2	3	4	5
4.	Many situations make me worry.	1	2	3	4	5
5.	I know I should not worry about things, but I just cannot help it.	1	2	3	4	5
6.	When I am under pressure I worry a lot.	1	2	3	4	5
7.	I am always worrying about something	1	2	3	4	5
8.	I find it easy to dismiss worrisome thoughts.	1	2	3	4	5
9.	As soon as I finish one task, I start to worry about everything else I have to do.	1	2	3	4	5
10.	I never worry about anything.	1	2	3	4	5
11.	When there is nothing more I can do about a concern, I do not worry about it any more.	1	2	3	4	5
12.	I have been a worrier all my life.	1	2	3	4	5
13.	I notice that I have been worrying about things.	1	2	3	4	5
14.	Once I start worrying, I cannot stop.	1	2	3	4	5
15.	I worry all the time.	1	2	3	4	5
16.	I worry about projects until they are done.	1	2	3	4	5

Appendix B (Continued)

The following set of questions asks about your satisfaction with various aspects of your life. Please circle the number on the word that best describes your satisfaction with each area.

I would describe my satisfaction with	Terrible	Unhappy	Mostly Dissatisfied	Mixed	Mostly Satisfied	Pleased	Delighted	Does Not Apply
my childhood as:	1	2	3	4	5	6	7	9
my current family life as:	1	2	3	4	5	6	7	9
my experience at the University of Kentucky as:	1	2	3	4	5	6	7	9
my friendships as:	1	2	3	4	5	6	7	9
where I live as:	1	2	3	4	5	6	7	9
my relationship with a significant other as:	1	2	3	4	5	6	7	9
my work for pay as:	1	2	3	4	5	6	7	9
my social life as:	1	2	3	4	5	6	7	9
my academic life as:	1	2	3	4	5	6	7	9
my extracurricular activities as:	1	2	3	4	5	6	7	9
my financial situation as:	1	2	3	4	5	6	7	9

This set of questions gets at how you generally deal with the situations that arise in your life.
Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement. The rating scale is as follows:
0 I don't usually do this at all
1 I usually do this a little bit
2 I usually do this a medium amount
3 I usually do this a lot

OVER THE PAST WEEK				
I concentrate my efforts on doing something about the situation I'm in.	0	1	2	3
I say to myself "this isn't real".	0	1	2	3
I use alcohol or other drugs to make myself feel better.	0	1	2	3
I get emotional support from others.	0	1	2	3
I give up trying to deal with it.	0	1	2	3
I take action to try to make the situation better.	0	1	2	3
I refuse to believe it is happening.	0	1	2	3
I say things to let my unpleasant feelings escape.	0	1	2	3
I get help and advice from other people.	0	1	2	3
I use alcohol or drugs to help me get through it.	0	1	2	3

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Appendix B (Continued)

I try to see it in a different light, to make it seem more positive.	0	1	2	3
I criticize myself.	0	1	2	3
I try to come up with a strategy about what to do.	0	1	2	3
I get comfort and understanding from someone.	0	1	2	3
I give up attempting to cope.	0	1	2	3
I look for something good in what is happening.	0	1	2	3
I make jokes about it.	0	1	2	3
I accept the reality of the fact that it is happening.	0	1	2	3
I try to get advice from other people about what to do.	0	1	2	3
I learn to live with it.	0	1	2	3
I think hard about what steps to take.	0	1	2	3
I blame myself for things that happen.	0	1	2	3

The following set of questions asks about your social support. Please read and select the number/word that best describes the social support you receive from family, friends, and significant others.

	Very Strongly Disagree	Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree	Very Strongly Agree
There is a special person who is around when I am in need.	1	2	3	4	5	6	7
There is a special person with whom I can share joys and sorrows.	1	2	3	4	5	6	7
My family really tries to help me.	1	2	3	4	5	6	7
I get the emotional help & support I need from my family.	1	2	3	4	5	6	7
I have a special person who is a real source of comfort to me.	1	2	3	4	5	6	7
My friends really try to help me.	1	2	3	4	5	6	7
I can count on my friends when things go wrong.	1	2	3	4	5	6	7
I can talk about my problems with my family.	1	2	3	4	5	6	7
I have friends with whom I can share my joys and sorrows.	1	2	3	4	5	6	7
There is a special person in my life who cares about my feelings.	1	2	3	4	5	6	7
My family is willing to help me make decisions.	1	2	3	4	5	6	7
I can talk about my problems with my friends.	1	2	3	4	5	6	7

Appendix B (Continued)

On-line Program for Managing Stress and Anxiety

College students are busy and have varying schedules; thus, they may finding it

difficult to participate in mental health and well-being promotion activities that require

attendance at a meeting or face-to-face session. In order to develop more accessible and

convenient support for promoting college-students' well-being, we are interested in your

thoughts about web-based activities that might reduce your worrying and enhance your

sense of well-being. Please respond to these questions about an Internet-based activity.

Please respond to the following questions regarding your preference of participating in an on-line anxiety management training program.

Would you be interested in developing strategies for dealing with stress and anxiety related to your college and personal life?
--- Yes   ---NO

If you answer yes, please rank them in your order of preference. (1 = most preferable, 3 = least preferable).

- Individual face-to-face counseling
- Online self-help training program
- Face-to-face Group-support

If an online anxiety management self-help training program was available, how likely is it that you would participate in this activity? (Please select one)
- Very Likely
- Likely
- Unlikely
- Very Unlikely
- Not sure

If you answer the previous question as very likely/ likely, would you prefer this on-line training to be:
- Receive the feedback based on your specific responses via email regularly.
- Receive feedback based on your request using the "contact us" icon.
- Without any feedback.

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Appendix B (Continued)

How likely would you be to search the Internet for information for certain condition related to your physical health:

- - Very Likely
- - Likely
- - Unlikely
- - Very Unlikely
- - Not sure

How likely would you be to search the Internet for information for certain condition related to your mental health:

- - Very Likely
- - Likely
- - Unlikely
- - Very Unlikely
- - Not sure

How likely would you be to search the Internet looking for online-assistance strategies for your health improvement:

- - Very Likely
- - Likely
- - Unlikely
- - Very Unlikely
- - Not sure

How likely is it that you trust these online information and strategies:

- - Very likely regardless the website type
- - Only trust scientific or health organization resources (e.g. scientific journals, medical websites)
- - Unlikely
- - Not applicable

Please respond to the following questions related to your demographics.

How old are you?	_____years
What is your gender?	1. Female 2. Male

Appendix B (Continued)

How do you describe your race?	1. White – not Hispanic
	2. Black – not Hispanic
	3. Hispanic or Latino
	4. Asian or Pacific Islander
	5. Other (specify):
	_____

Which best describes your parents' marital status.	1. Never married to each other.
	2. Married
	3. Divorced
	4 Widowed

Which best describes your mother's level of education?	1. Did not complete high school.
	2. High school
	3. Some college or post secondary education
	4. College degree
	5. Post bachelors degree

Which best describes your father's level of education?	1. Did not complete high school.
	2. High school
	3. Some college or post secondary education
	4. College degree
	5. Post bachelors degree

What is your marital status?	1. Single
	2. Married

What best describes your spiritual or religious involvement?	1. I am neither spiritual or religious.
	2. I am spiritual, but not religious.
	2. I am religious, but do not participate in a specific religious group.
	3. I attend religious services occasionally.
	4. I attend religious services at least monthly.
	5. I attend religious services weekly.

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Appendix B (Continued)

With whom do you currently live? (Select all that apply.)	1. Alone 2. Spouse/boyfriend/girlfriend/ partner 3. Roommate(s)/friend(s) 4. Parent(s)/guardian(s) 5. Other relatives 6. Your children 7. Other
Where do you currently live?	1. Residence hall 2. Fraternity or sorority house 3. Other university/college housing 4. Off-campus house or apartment 5. Parent/guardian's home 6. Other
What is your class standing?	1. Freshman 2. Sophomore 3. Junior 4. Senior 5. Graduate student/Professional student
Which college within the University are you enrolled? i.e. Arts and Science, Education, Business, Engineering, Nursing, Agriculture, Communication, Design, Social Work, Allied Health, Pharmacy, Public Health, Medicine, Dentistry, Law; Other?	_____Current college enrollment
How many hours each week do you work for Pay?	———
At the time I am completing this survey I would rate my overall tension regarding my college life as:	1 Less than usual 2 As usual 3 More than usual
At the time I am completing this survey I would rate my overall tension regarding my social life as:	1 Less than usual 2As usual 3 More than usual

Appendix B (Continued)

At the time I am completing this survey I would rate my overall tension regarding my work as:	1 Less than usual
	2 As usual
	3 More than usual
At the time I am completing this survey I would rate my overall tension regarding my financial status as:	1 Less than usual
	2 As usual
	3 More than usual
How would you describe your satisfaction with the way you deal with your daily challenges and worries?	1 Very satisfied
	2 Fairly satisfied
	3 Not very satisfied
	4 Not at all satisfied
	5 Not sure
Are you interested in learning new way for dealing with your daily challenges and worries?	1 Very interested
	2 Somewhat interested
	3 Not very interested
	4 Not at all interested

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Educational Background

Year	Degree	Institution
1996	Bachelor in Nursing	Jordan University of Science and Technology, Irbid, Jordan
2000	Master in Nursing Education	University of Jordan, Amman, Jordan

Certificates and Licensure

Year	License
1996	Jordanian RN License
	Jordanian Nurses and Midwives Council
2001	ABG & Chest Physiotherapy License
	Jordanian Nurses and Midwives Council

Professional Positions Held

Year	Employer	Title
2007 – 2011	University of Kentucky College of Nursing, Lexington, KY	Research Assistant
2005 – 2007	Jordan University of Science and Technology, Irbid, Jordan	Clinical Trainer
2003 – 2004	Ministry of Health Nursing Institutes, Abu Dhabi, UAE	Senior Nursing Tutor
2001 – 2003	Jabal Al-Zayton Hospital, Zarqa, Jordan	Head of In-Service Education Department
2001 – 2003	Jabal Al-Zayton Hospital, Zarqa, Jordan	Nursing Educator
1998 – 1999	University of Jordan, Amman, Jordan	Clinical Instructor
1997 – 1998	Jordan Hospital, Amman, Jordan	Staff Nurse
1996 – 1997	University of Jordan Hospital, Amman, Jordan	Staff Nurse

Scholastic and professional honors

Year	Honors	Institution
2009	Best Doctoral Student Poster Presentation, Scholarship Showcase	University of Kentucky, College of Nursing
2010	Second place award for best oral presentation,4th annual Graduate Student Interdisciplinary Conference	University of Kentucky
2010	College of Nursing Sima Rinku Maiti Scholarship	University of Kentucky

Research Presentations

2009	The relationship among undergraduates' mental health and demographics, life- satisfaction, and coping strategies. Poster Presentation, Southern Nursing Research Society Conference, Baltimore, MD
2009	The relationship among undergraduates' mental health and demographics, life- satisfaction, and coping strategies. Poster Presentation, University of Kentucky, CON Scholarship Showcase, Lexington, KY
2010	Psychometric Properties of the 21-Item Depression, Anxiety, and Stress Scale (DASS-21) Among a Sample of Young Adults. Poster Presentation, Southern Nursing Research Society Conference, Austin, TX.
2010	Psychometric Properties of the 21-Item Depression, Anxiety, and Stress Scale (DASS-21) Among a Sample of Young Adults. Poster Presentation, University of Kentucky, CON Scholarship Showcase, Lexington, KY
2010	The Role of Maladaptive Coping in Predicting Undergraduates' Psychological Distress Symptoms. Oral presentation at the 4th annual Graduate Student Interdisciplinary Conference, Lexington, KY

Professional Memberships and Committees

2007	Kentucky Alcohol Prevention Committee
2007	Graduate Student Activities and Advisory Committee
2008	The Honor Society of Nursing, Sigma Theta Tau International
2008	Golden Key International Honour Society
2009	Southern Nursing Research Society

Publications

Mahmoud, J.S., Hall, L., and Staten, R. (2010). The Psychometric Properties of the 21-Item Depression, Anxiety, and Stress Scale (DASS-21) Among a Sample of Young Adults. *Southern Online Journal of Nursing Research, 10*(4). Online: http://snrs.org/publications/SOJNR_articles2/Vol10Num04Art02.html

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Signature