

HEALTH CARE EDUCATION: UNDERSTANDING
GRADUATE STUDENTS' STRESS AND
LEARNING STRATEGY PREFERENCES

By

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CHAPTER 1

INTRODUCTION

Introduction

Stress is an unavoidable fact of life, and human beings are not exempt from the pressures and circumstances that may cause stress (Selye, 1978). Stress is a familiar word that has received much attention over the past few decades. Hans Selye, a pioneer of medicine and revolutionary researcher of stress believes that "complete freedom from stress is death" (Costley et al., 1991, p. 424). Stress is a multidimensional concept affecting the mind and body. The concept of stress can be categorized into two areas; (a) Physiological stress generally pertains to the human body and its physical reactions, and (b) psychological stress relates to imploring emotional responses in the cognitive and behavioral domain.

Economists reveal great concern for lost labor due to stress in their workforce. The American Institute of Stress considers it to be the number one health problem in the U.S. with job stress costing the U.S. \$300 billion annually (www.stress.org). Physicians are keenly aware of the connections stress has to illness (Selye, 1978). In today's world, typical buzzwords and phrases like de-

stress, take a mental health day, stress management training, and goals of living stress free are commonplace.

This stress era can influence college life. This is visible through increased alcoholism and binge drinking, poor student health, and steady increases in dropout rates (D'Zurilla & Sheedy, 1991; Misra, 2000; Sax, 1997). The disturbing trend in college student health is evident with reported increases in student stress nationwide (Sax, 1997, p. 252). Due largely to these increases, tremendous literature exists about first-time college student stress. Much of the literature centers on adjustments of leaving home and pressures of a new academic setting (D'Zurilla & Sheedy, 1991; Towbest & Cohen, 1996). However, little research exists on stress and the advanced degree seeking students.

Recently, collegiate administration and researchers have shifted interests to academic stress and the affect stress has on learning (Beck et al., 1997; Everly et al., 1994; Rocha-Singh, 1994; Stewart et al., 1999). Academic stress is the stress that occurs due to rigors of an academic setting.

As students experience stress in college, their learning can be affected. Whether the stress originates from new expectations placed on them by society and faculty

members or internally, college can be an extremely stressful experience. College students are required to learn and retain massive amounts of material, concepts, and theories. As students are expected to learn new and meaningful information, the stress they experience may potentially detract from the learning experience (Mosley et al., 1994, p. 765).

Learning to manage stress is important, especially in the formative college years. Often students who have not been able to cope with their stress have increasingly more stress as they perceive their inadequacy to deal with the situation (Frazer & Etternach, 1991; O'Meara et al., 1994). This cycle of students not managing their stress levels can carry over into their lives as working professionals. Health care professional students are no exception as they too face stress in college. A demanding health care profession usually begins with a demanding academic curriculum where coping with stress is paramount. While students bring varying levels of stress with them into the new academic program, breaking the cycle of mismanaged stress is a viable option.

People are intricate beings that manage and mismanage stress. Due to the complexities of stress and the differences in individuals, stress is extremely specific to

the individual. More so, the individual's view of stress is significant because individuals' perceptions of situations can have great variance (Lazarus et al., 1985). Whether or not stress is present is not as relevant as what students believe to be relevant in their lives.

Many health care related studies reveal the extreme occurrences of stress with specific concentrations on burnout and depression (Frazer & Etternach, 1991; Mosley et al., 1994; O'Meara et al., 1994). The inability to manage stressful situations lends health care students to suffer from physical and emotional effects of stress (Frazer & Etternach, 1991; O'Meara et al., 1994). Stress can take on many forms, yet two terms can conceptualize stress: physiological stress and psychological stress.

Physiological Stress

Hans Selye (1978), a physician trained in Prague, identifies physiological stress detailing the effects of stress on the human body. His research primarily focused on the physical conditions that occur in the body when under stress. Selye's definition of stress is widely accepted. He defines stress as "the nonspecific response of the body to any demand" (p. 472). Stressors are those external factors that produce stress (Selye, 1978, p. 78). A

stressor can be considered the cause while the stress is the effect (Selye, 1978).

Selye also provides a more direct way of thinking about stress. It is the "rate of wear and tear in the body" (p. 1). Externally, the body may show visible physiological reactions to stress in a number of ways such as sweaty palms, rapid breathing, and an increased heart rate. Internally, Selye notes that more reactions may occur inside one's body that are not visible.

Psychological Stress

Unlike physiological stress, emotional or psychological stress is often more difficult to isolate than the physiological forms of stress described by Selye. Ideally, students strive towards psychological balance. Psychological balance is when perceived stress is evaluated and then balanced with adequate coping resources. Anxiety is also a term connected to stress that affects the psychological balance of an individual.

Many consider stress and anxiety to be identical concepts, yet they are not. Rollo May (1977), an existential psychoanalyst, has written extensively on the difference between stress and anxiety. In his book, The Meaning of Anxiety, May (1977) warns against using stress

as a synonym for anxiety. The differences between stress and anxiety are as follows:

Anxiety is how the individual relates to stress, accepts it, and interprets it. Stress is a halfway station on the way to anxiety. Anxiety is how we handle stress. (p. 113)

The Diagnostic, Statistical Manual for Mental Health

(DSM-IV, 1994) is a manual used by clinicians and researchers in the mental health fields to classify different mental disorders. The DSM IV defines anxiety as the "apprehensive anticipation of future danger or misfortune accompanied by a feeling of dysphoria or somatic symptoms of tension" (p. 764). Unlike anxiety, stress is not a term defined in the DSM- IV Manual.

Students' perception of their stress levels can also negatively affect learning (Lazarus et al., 1985). A perceived stress whether minute or massive is the frame of reference from where students make decisions. This perceived stress often impacts decision-making abilities and reflects how students view the world around them. Decision-making skills are crucial for health care professionals as they focus on human life and improving health (Mosley et al., 1994, p. 765).

Academic Stress

Academic stress is the stress of activities related to studies and life for students attending higher education (personal communication, Gadzella, 2001). Academic stress can involve both physiological and psychological responses and is most often related to a learning environment, project, or task (O'Meara et al., 1994). This relationship between perceived stress levels and illness susceptibility brought on by stress can affect student performance and wellness (O'Meara et al., 1994).

Stress can bring about various negative affects on learning (Mosley et al., 1994, p. 765). High levels of stress may work against students as they attempt a mastery of the academic curriculum (Stewart et al., 1999, p. 243). Stress is found at the graduate levels of academia, and it is evident in the area of health care professional programs. The desire to master large amounts of material and to perform well on an examination, time restraints, and fear of failure are instigators of stress for health care professional students (Towes et al., 1997, p. 1000).

Research on academic related stress has only recently begun to resonate within higher education populations. The most recent research is typically specific especially toward a group of students or a particular discipline, such

as medicine or dentistry. For instance, research has been conducted with stress and its effects on marital relations of medical students (Katz, 2000, p. 3), with Latino college students on the role of stress and family support (Torres & Solberg, 2001, p. 53), and with student nurses and stress concerning work and school programs (Jones & Johnson, 1999, p. 162). This precise research is advantageous in seeking improvement of health care education programs to improve services, curricula, and general student needs.

Health Care Education

Current health care professional and graduate students have multiple stressors that can affect their lives. Graduate students pursuing health care fields are grouped and referred to as professional health care students. Research in academic medicine finds that "medical school is recognized as a stressful environment that often exerts a negative effect on the academic performance, physical health, and psychological well being of the students" (Mosley et al., 1994, p. 765).

Stress symptoms and reactions may overlap the two categories of physiological and psychological stress. For example, a student may have an elevated heart rate and have problems recalling an answer to a question that is known. Academic-related stress falling under the psychological

category can also produce many physiological symptoms of stress. For example, a student may experience feelings of panic before an exam thereby blocking efforts to study.

The perception of the health care education admissions process is that of a highly stressful environment with rigorous application procedures, intense personal interviews, and challenging admissions testing. This process is completed before beginning a degree program in health care education. Further perceptions of professional health care training is that of a highly intense curricula, unparalleled competition and high expectations.

Since the process of gaining acceptance to professional degree programs in itself can be stressful, students are all too familiar with stress. Typically, one expects the presence of stress when completing degrees with high academic standards and rigorous coursework. Professional degree programs are designed so that by passing the designated national and state exams students may obtain professional licensure. This professional licensure enables the person to legally practice in a particular field. A professional degree program is intended to prepare an individual for a specific career or profession. Whereas academic degree programs may provide

specific content, the degree is not directly connected to one profession or licensure.

The University of Oklahoma-Tulsa (OU-Tulsa) offers professional health care programs in allied health, medicine, nursing, pharmacy, and public health. The campus is located on a 56-acre facility in Tulsa, Oklahoma. OU-Tulsa affords students seeking health care careers an option to study in both of Oklahoma's metropolitan cities: Oklahoma City and Tulsa. The delivery of academic courses at the Tulsa campus is presented in multiple formats, which includes distance education, live interactive television, world-wide-web enhanced courses, and traditional formal lecture.

These health care disciplines incorporate clinical experiences or residencies within the community emphasizing real-life learning as part of the curricula. Real-life learning is learning that is "relevant to the living tasks of the individual in contrast to those tasks considered more appropriate to formal education" (Fellenz & Conti, 1989, p. 3).

Students seeking professional health care careers generally have high scholastic achievements and successful histories in academics. The University of Oklahoma like many universities has a rigorous application process,

requiring entrance exams, observation hours, plus several years of prerequisite coursework before receiving acceptance to begin a program. Most program applications are complex promoting competition among a myriad of qualified students.

Once admitted, students are often required to transition between classrooms and clinics adjusting to the learning environment. Students are expected to adjust from the structured academic environment to interpersonal client interactions while maintaining the highest level of professionalism and ethical standards. Often this results in adding more pressure to an already challenging curriculum.

With these obligations, students' abilities to cope with stress while learning required coursework become of even greater importance to their educational success. Adult educators can utilize expertise and knowledge of coping with stress within the field to guide and promote students' educational success in various disciplines. By relying on strong, effective techniques found in adult learning, graduate students can use these techniques to evaluate and potentially adjust their perceived stress levels.

Adult Education

The field of study of adult education can be traced back to the founding of the American Association for Adult Education (AAAE) in 1926 (Courtney, 1989, p. 16). This field of study places the focus on the individual and the individual's experiences as they relate to learning. Today the focus has advanced from adult education to adult learning (Fellenz & Conti, 1991; Knowles, 1980). The adult learning premise is that adults take responsibility for their own learning; in essence, they own it. Adults enter into learning activities with personal experiences. These experiences incorporate rich resources for students to gain from one another and not just from the instructor.

Malcolm Knowles (1970), a legendary adult education author, introduced a new model of assumptions of adult learning as "andragogy". Andragogy is "the art and science of helping adults learn" (p. 43). As a central component of adult learning, andragogy's foundation is the encouragement for adults to be active in all steps of the learning process. The andragogical concept is rooted in four assumptions of adult learning. The andragogical model reveals that adults experience:

1. The need to know. Adults need to know why they need to learn before beginning their learning task (Knowles, 1989, p. 64).

2. The learners' self-concept. The self-concept moves from one of being a dependent personality toward one of being a self-directed being.
3. The role of the learners' experiences. They accumulate a growing reservoir of experience that becomes an increasing resource for learning.
4. Readiness to learn. This becomes oriented increasingly to the developmental tasks of social roles.
5. Orientation to learning. Their timeperspective changes from one of postponed application of knowledge to immediacy of application, and accordingly, orientation toward learning shifts from one of subject-centeredness to one of performance-centeredness (Knowles, 1980 pp. 43-44).
6. Motivation. Their motivation to learn is receptive to both external and internal motivators (Knowles, 1984, p. 68).

While andragogy is a core concept of adult education, three other major concepts are important to adult learning: (a) self-directed learning, (b) lifelong learning, and (c) real-life learning. These concepts are imbedded in the adult learning process and are found as professional health care students verge on learning tasks.

Adult learners are classically active participants and interpret their experiences. An adult learner is distinctive from children because of accumulated life experiences and the ability to reflect on those experiences. This critical reflection "involves our recognizing the assumptions underlying our beliefs and

behaviors" (Brookfield, 1988, p. 325). When adults reflect on experiences, this incorporates the ability to make subtle discrimination between varying degrees and kinds of truth, which itself permits a more faithful understanding of reality (Hostler, 1977, p. 61).

Self-Directed Learning

Along with Knowles' (1975) humanistic approach to adult learning, he has contributed much new knowledge in the area of self-directed learning. Self-directed learning places an emphasis on the learner as an individual. The self-directed learner is one who helps define what is to be learned and how the task is to be evaluated. Self-directed learning is:

A process in which individuals take the initiative with or without the help of others in diagnosing their learning needs, formulating learning goals, identifying human material resources for learning, choosing and implementing appropriate learning strategies and evaluating learning outcomes. (p. 18)

Self-directed learning is reinforced with adults because "when people have the opportunity to learn by taking some initiative and perceiving the learning in the context of their own life situation, they will internalize more quickly, retain more permanently, and apply more confidently" (Knowles, 1992, p. 11).

Students with a positive self-concept are responsible for their own lives and desire to direct their own learning. Self-concept is "the composite of ideas, feelings, and attitudes that a person has about his or her own identity, worth, capabilities and limitations" (O'Toole, 1997, p. 1348). This developing self-concept will stimulate "a deep psychological need to be seen and treated by others as being capable of self direction" (Knowles, 1989, p. 83). As times change and technology advances health care, students must evoke self-directed learning techniques to remain current and knowledgeable in their respective fields. As health care professional students initiate further learning or explore additional information, they are in essence utilizing self-directed learning skills.

Lifelong Learning

Modern adult learning practices emphasize the importance for adults to become lifelong learners. Lifelong learning is "the process of learning that continues throughout one's lifetime based on individual needs, circumstances, interests, and learning skills" (Chobot, 1989, p. 377). Adult learners and educators tend to embrace Knowles' (1984) philosophy that "in order to prepare human beings for a world of accelerating change,

all of education should be organized around the concept of lifelong learning" (p. 363).

Current health care literature also reflects many of the concepts found in adult education. The prevailing attitude is that:

If physicians are to be lifelong learners and able to assess changing health care needs, to keep up with changing concepts and new knowledge, and to adapt their own performance accordingly, they must develop the requisite skills during the formative years of medical school training. (Neufeld & Barrows, 1974, p. 1041)

Real-Life Learning

When learning reflects real life, Smith (1982) believes meaning is incorporated (p. 30). The importance of Robert Smith's thinking comes from providing a logical process about adult learning. One of Smith's fundamental learning beliefs is that "a central task of learning how to learn is developing awareness of oneself as a learner" (p. 30). Real-life learning is simple. It is learning that occurs from the real-life experiences of the learner. The learner's choices, opportunities, problems and experiences are reflected immediately when learning from life.

Real-life learning is student-centered. This is different from the traditional academic setting of teacher-centered instruction where the teacher is viewed as the

expert. "People are generally ill-prepared through formal education to learn from everyday life experience"

(Sternberg, 1990, p. 35). Other ways in which real-life learning differs from formal education is that in real-life there are a multitude of answers to various problems or questions. Also, problems are often solved by groups of learners versus an individual (Sternberg, 1990, p. 35).

Learning Strategies

As students act in a particular manner when initiating a new learning project, they are utilizing their learning strategy preference. Learning strategies are the techniques or skills that an individual elects to use in order to accomplish a learning task (Fellenz & Conti, 1989, p. 7). Learning strategies are often influenced by experience and circumstances specific to the learner.

Learning styles are often confused with learning strategies. Learning styles of adults are steady throughout the learner's life. While learning styles are stable, learning strategies can fluctuate as learners can best complete the task at hand (Fellenz & Conti, 1991, p. 64).

Specifically, "learning strategies tend to focus on solving real problems involving metacognitive, memory, motivational, and critical thinking strategies" versus the

study of "skills in note taking, outlining, and test passing" (Fellenz & Conti, 1989, p. 4). Although learners have a dominant learning strategy preference, they may select to use other strategies. Alternative strategies can be learned to best approach and complete the learning task (James, 2000, p. 66).

Metacognition is a popularized term in education that generally refers to a persons' awareness of how they learn. A full understanding of one's learning strategy can improve student performances in the classroom (Munday, D., 2003; Munday, W., 2003).

Problem Statement

The substantial amounts of knowledge health care professional students are expected to master can be overwhelming and immensely stressful (Balogun et al., 1999; Frazer & Etternach, 1991; O'Meara et al., 1994). Time pressures of overcrowded curricula, academic performance, fear of failure, unfulfilled expectations, and societal expectations are a few of the issues that beleaguer health care professional students (Balogun et. al., 1999; Brust, 1986; Carmel & Bernstein, 1987; Misra et al., 2000). Furthermore, the shared responsibility of another's health is a pressure that often affects health care professional students (Frazer & Etternach, 1991; O'Meara et al., 1994).

Stress is a multidimensional concept of physiological, psychological, and academic related stresses. These stresses can affect students at any given time in their higher education experience. If academic stress is believed to negatively affect learning abilities, what can be done to foster student learning as students attempt to learn and maintain new knowledge?

The health sciences and medical academic environment at OU-Tulsa lacks a clear description of the types of stress or stressors that students may experience. To describe students' stress and to understand who is affected by this stress can lead students to accurately define their stress. Understanding to what degree stress affects the learner can provide insight to university student services, to administration, and for future program development. In defining the stress students may begin to uncover ways of managing and controlling personal stress effectively.

The relationship between academic stress and learning strategy preferences provides students a viable option to maintain, control, and evaluate their learning process. Due to the high level of responsibilities placed on health care professional students academically and socially, the ability to learn is vital. The nature of their task is focused on healing and saving lives. Therefore, health

care professional students' understanding and application of knowledge is imperative.

As research and technology progress, these health care professionals must also be knowledgeable of the newest technology, theories, and practices. This expectation encourages students to become lifelong learners in order to succeed. Ideally teaching students to become lifelong learners will enable them to have the information as to best treat or serve their patients as they advance in a particular career.

In analyzing learning strategy preferences, students can learn to adapt their learning strategy to enrich the learning task. When students have options to select the best learning strategy for the task, their stress levels could potentially decrease. Understanding learning strategies may offer opportunities to create and implement different skills that can be helpful to professional health care students. Analyzing the strategy used by the student may provide ways to lower stress levels of professional health care students when engaging in learning activities.

Purpose

The purpose of this study was to describe the stress levels and learning strategies of professional graduate students in a health science center. In addition to

describing each of these, the study investigated the relationship between stress and learning strategy of a specific group of professional health care students. In order to accomplish this, the descriptions were based on both quantitative and qualitative data.

Research Questions

After a profile was constructed of the students for the demographic variables of age and gender and for hours of work and hours of study, the following research questions were addressed:

1. What are the learning strategy preference categories of students in health science professions?
2. How do learning strategy categories of students in the health science professions compare to the norms for Assessing the Learning Strategies of Adults (ATLAS)?
3. What is the relationship between stress and (a) demographic variables and (b) academic variables.
4. What is the profile of students in the health science professions for stress as measured by the Student-life Stress Inventory (SSI)?
5. What is the relationship between learning strategies and (a) demographic variables and (b) academic variables.
6. What is the relationship of the SSI and ATLAS?
7. How does the different learning strategy preference groups cope with stress?

Methods

Both quantitative and qualitative data were collected. Instruments are available to measure student stress levels

and learning strategies. Quantitative data was collected using two instruments: Assessing the Learning Strategies of Adults (ATLAS) and Student-life Stress Inventory (SSI). The ATLAS provides learning strategy preference categories, and the SSI measures general student stress levels. The ATLAS and SSI instruments provide quantitative data. This data was analyzed with frequency distributions to produce profiles of the students on each instrument. The concepts in the two instruments were compared to the demographic and academic variables using the statistical technique of analysis of variance. Chi-square was used to compare the categorical data from the instruments. Focus group interviews with specific learning strategy preference groups provided the qualitative data. The constant comparative method of data analysis was used to analyze the data from the focus groups. This method is "widely used in all kinds of qualitative studies" (Merriam, 1998, p. 18). The constant comparative method involves "comparing one segment of data with another to determine similarities and differences" (p. 18).

This strategy combines inductive category coding with a simultaneous comparison of all social incidents observed. As social phenomena are recorded and classified, they also are compared across categories. Thus, the discovery of relationships... begins with the analysis of initial observations [and]

undergoes continuous refinement. (Lincoln & Guba, 1985, p. 335)

This study relied upon volunteer participation. Assumptions were made that the volunteers were truthful about their personal experiences. The majority of the volunteers were from the College of Allied Health studying Physical and Occupational Therapy. A limitation of this study was that the sample population represented a single context within one environment. The sample was limited to one higher education institution focusing on health science programs at the University of Oklahoma, Tulsa.

CHAPTER 2

REVIEW OF THE LITERATURE

Stress

Stress is a fact of life, yet many people have mastered the ability to handle or react to stress positively. Many have not. In the field of health care, stress is omnipresent. Are health care providers effectively instructed how to manage and handle the stress they may face in the workplace?

Stress is often present for students as they train to be health care professionals. Training can expose students to high levels of stress throughout the medical education process during performance-critiqued clinical rotations and comprehensive exams. Many colleges and universities review the effectiveness of the healthcare training only as it relates to the patients served. The focus on effectiveness of training students is often knowledge-based or content-based. When training includes stress management techniques coupled with content information, students are presented with a more realistic worldview of health care fields and better ways to handle professional demands.

Massive volumes of informational material can be found on stress, which is likely due to the fact that "stress as a universal human and animal phenomenon results in intense

and distressing experience and appears to be of tremendous influence in behavior" (Lazarus, 1966, p. 2). By most accounts, the term 'stress' originated in the field of engineering, and to the engineer stress is "any external force directed at some physical object" (p. 12). The multidimensional concept of stress can be hard to define due to the inconsistent terminology reflected in the literature and the various contradicting definitions (p. 2). One probable reason for the multiple theories on stress can be relayed back to the different disciplines that study stress. Sociologists and anthropologists are primarily focused on the social science perspective of stress while medicine, psychiatry, and physiology are deeply rooted in the biological science aspect.

Stress-related research shows "that it is difficult to distinguish physical health (physiological) from psychological health" (Hobfoll, 1988, p. 81). However for comprehension purposes, stress can easily be divided into two categories: physiological and psychological stress (Hobfoll, 1988; Lazarus, 1966). Furthermore, "psychological stress represents a totally different level and type of analysis from physiological stress and comprises a separate although related set of problems" (Lazarus, 1969, p. 171). Although "physiological and

psychological theories have evolved separately, it is becoming clear that the two perspectives cannot be separated" and that "an integrative approach provides the most information" when studying stress (Lazarus, 1969, p. 19). Stress management and coping can be effectively taught in health care training and medical education, thus improving students' performances, as they become independent medical providers.

Physiological Stress

Dr. Hans Selye's (1956) research is at the forefront of physiological stress theories. His findings are centered on the premise that the body responds against a stressor. He coined the theory "general adaptation syndrome" consistently found in medical literature (Lazarus, 1969, p. 169). In his book The Stress of Life (1978), Selye conveys to the reader what medicine has learned about stress since the 1930s. His premise is that once the body detects stress, the body presents the stress in human tissues and hormones thereby affecting one's physical health. A stress or stressor is known as 'noxious stimuli', which means injurious or harmful stimuli (p. 170). Theorizing, Selye states "life is largely a process of adaptation to the circumstances in which we exist" (p. xv).

Although stress is not a new concept, many alternative techniques of managing and coping with stress continue to develop. If "man always knew about this condition and now still fails to grasp its essence completely," the manner in which educators train health care providers should be consistently reviewed and evaluated for effectiveness (Selye, 1978, p. 4).

Psychological Stress

It is difficult to define the parameters of psychological stress because stress is interpreted by the individual (Lazarus, 1969). When "the most important values and goals of the people observed are endangered or disrupted", a person experiences stress (Lazarus, 1966, p. 2). Furthermore, "the stressor effects depend not so much upon what we do or what happens to us but on the way we take it" (Selye, 1978, p. 370). Even though stress is unavoidable, individual reactions to stress can be modified to better manage stressful situations.

There are four main classes of reactions used to index stress: (a) reports of disturbed affect, (b) motor-behavioral reactions, (c) changes in the adequacy of cognitive functioning, and (d) physiological changes (Lazarus, 1966, p. 6). With reports of disturbed affects, the reactions are likely to be in the form of fear and

anxiety. Depression is also an effect of stress. For the motor-behavioral class, the reactions can be in the form of muscle tension or speech disturbances. As for cognitive function, stress creates disruptions with problem solving and basic perceptual skills. Physiological changes seen in this stress index are much more internal, such as a change in adrenal glands affecting hormones and the autonomic nervous system. Also a person's heart rate and blood pressure can be affected.

The process of stress is explored mostly relying on a person's ability to cognitively think about what is happening and then about how to cope with what has happened. This process is illustrated in Hobfoll's (1988) work:

The stress process is mediated by cognitive appraisal and by coping. Cognitive appraisal is the evaluative process by which individuals assess his or her stress in a particular circumstance. Coping in turn, is defined as the process by which individuals manage both the demands that are appraised as stressful and the negative emotions generated by this appraisal. (1988, p. 10)

McGrath (1970) defined stress as "a substantial imbalance between environmental demand and the response capability of the focal organism" (Hobfoll, 1988, p. 17). This imbalance can be detected in graduate students in the health care professions. Students out of balance often

provide warning signs to classmates and professionals.. For example, a warning sign might be a change in eating habits or erratic behavior not typically common to the student. Early detection that a student is experiencing problems with stress provides the student an opportunity to quickly handle the problem or circumstance to avoid various academic predicaments, such as failing a course.

It is important to consider that "ongoing stress influences the ability to concentrate properly, it distorts thinking and generally reduces intellectual functioning" (Addley, 1997, p. 13). For students, research shows that social support has significant effects when utilized to manage stress (Addley, 1997, O'Meara et al., 1994). "Social support has significant main effects and that it is most important in stressful circumstances" (Turner, 1981 p. 364). Improvements in medical education training could prove a viable option in reducing negative effects of stress on students possibly in the form of a universal course on helping students handle stress in the work and academic environments.

Academic Stress

The predominant historical literature on stress was produced from the mid 1950's to present day. Research began to surface over the past decade focusing on academic

related stress. Much of the literature of relevance on academic stress involves medical education, specifically related to training physicians.

For the purpose of this study, academic stress was defined as stress experienced or perceived by a student in direct relationship with one's academic performance and achievement. Academic stress may produce both physiological reactions and psychological reactions. It is understandable and somewhat expected that "students report experiencing academic stress at predictable times each semester with the greatest sources of academic stress resulting from taking and studying for exams, grade competition and the large amount of content to master in a small amount of time" (Misra & McKean, 2000, p. 41). Other types of academic stress may plague students throughout the academic school year.

Students who have consistently dealt with academic stress successfully or unsuccessfully tend to continue addressing stress in their career as they did in the training programs. For example, "adaptive or maladaptive skills developed during medical school may lay the groundwork for later professional adjustment" (Mosley et al., 1994, p. 765). Moreover, "physical therapy students who are stressed in school become licensed physical

therapists who continue to be stressed" (O'Meara et al., 1994 p. 75).

Ideally, students benefit when they can identify techniques and discover tools to manage and address their stress. "Stress research shows that feeling in control of the situation is related to lower levels of stress" (Misra & McKean, 2000, p. 52). Accomplishing better stress management skills during the student's professional training program is believed to ultimately produce more effective health care practitioners.

Health Care Education

Students in formal and informal curricula have the ability to directly affect their own learning, utilizing adult education techniques and concepts. Health care professional students are said to experience higher levels of stress than a student pursuing a generic academic program (Neufeld & Barrows, 1974; Stewart et al., 1999). Incorporating one or more adult education techniques in the learning process can significantly reduce health care professional students' stress by empowering students to take ownership of their learning.

The process of training adults for a profession is more than simply entering a room with four walls and listening to an expert speak on a particular subject.

Health care professional students are being trained formally in classrooms, but classroom learning continues to evolve. Adult students give much more value to hands-on experiences found in real-life settings (Sternberg, 1988). For instance, medical students are trained in classrooms where an educational foundation is built, and then students are placed in clinics, emergency rooms, doctors' offices, and hospitals for the real-life learning process. There are three categories of instructional learning settings: formal learning, non-formal learning, and informal learning (Merriam & Cafferrella, 1999). Simply characterized:

Formal learning takes place in educational institutions and often leads to degrees or credit of some sort. Nonformal learning refers to organized activities outside educational institutions, such as those found in learning networks, churches, and voluntary associations. Informal learning refers to the experiences of everyday living from which we learn something.
(p. 21)

The traditional or formal means of instruction is often thought of as lecture-based, didactic in nature with students being tested to measure their success of retaining and applying the knowledge. In the past decade, an onset of technology and distance education has somewhat transformed the formal instruction arena in that the delivery is fresh and new. However, the basic formal education principles still remain mostly lecture-based with

the expert disseminating information to students.

Conversely, non-formal instruction is typically viewed as less structured than formal education, often involving or striving towards social change.

An ideal illustration of non-formal instruction is Myles Horton and the Highlander School now called the Highlander Research and Education Center. Highlander is located in the hills of Tennessee and was an inspirational place for adult learning, ultimately leading to social change. Beginning with the Labor Movement onto segregation and the Civil Rights Movement of the 1960s, and to the present, Highlander still represents a place to organize and empower people.

It has been said that with informal learning, many adults may not even realize they are learning (Knowles, 1975). Furthermore, they may not realize they are indeed teaching one another. Research completed with a graduate support group provides an example of informal learning (Figueroa, 2003). This grassroots support group of Oklahoma State University students worked in collaboration in order to complete tasks associated with doctoral dissertation processes. The students in this support group would generate their own agendas and direct meeting sessions. Even though university instruction certainly falls within

the category of formal instruction, many students often expand their learning to encapsulate all three of the categories of instructional learning settings as they strive towards their chosen professions.

When teaching adult students, a zest to learn can assist students long after they complete their professional training (Houle, 1980). Houle also believes that students can be instructed in the benefits of continuing education as it relates to their professions. "Students can be taught about the evaluative and quality control systems to which they will become subject during practice, including peer review, re-licensure, and self-administrative examinations" (p. 86). This process is important for students as they become grounded in a profession.

Socialization in the Professions

Many continuing education opportunities are presented in both formal and informal settings. Cervaro (1988) believes, "The aim of continuing education should be to help professionals develop their ability to reflect in and on their own practice" (p. xi). Professionals, particularly health care professionals, have participated in formal training when obtaining a degree, passing exams for licensure, and completing other credentialing programs. These professionals then may rely on formal continuing

education to maintain the licensure, to remain current in the career fields, and to gain new knowledge through practice (Cervaro, 1988). "Formal continuing education programs should become a place in which practitioners learn to reflect on their own tacit theories of the phenomena of practice" (Schon, 1987, p. 321).

Many collegiate institutions have the goal to provide programs that prepare students for real-life situations and problems; however, a gap exists between what professional schools provide and what practicing professionals actually need to know; this begs the question, "Can the prevailing concepts of professional education ever yield a curriculum adequate to the complex, unstable, uncertain, and conflictual world of practice?" (Schon, 1987, p. 12).

Real-Life Learning

Real-life learning often commences because the adult needs an immediate application of the particular knowledge sought (Conti & Fellenz, 1991, p. 64). Basically, the adult has identified what it is that needs to be learned due to a specific circumstance. Robert Sternberg (1990) distinguishes between real-life learning problems and academic-centered learning problems. In real-life circumstances, adults are identifying problems unlike in

academic settings where the instructor usually identifies the problem (p. 35).

In academic learning, problems are typically structured, and there is one right answer. In real-world situations, problems are more complex and may have a multitude of answers, each with differing consequences. Other significant differences in real-world learning and academic-based learning are that real-life learning implores adults to examine other arguments and to adjust to delayed or missing feedback that is normally provided in academic settings. Moreover, real-life learning allows adults to solve problems by making group decisions as one would in a business or in a family unit. Academic environments strongly promote individual problem solving, which typically lacks necessary external information (p. 40).

A noted adult education author, Allen Tough (1967) expressed a practical focus on education. His mentor, Cyril O. Houle, heavily influenced this approach. Houle's opinion of real-life learning greatly impacted the field of education, signified by statements such as "knowledge is to be put to use, and, if it is not, why bother to pursue it" (Houle, 1961, p. 16). Both Houle and Tough believed that learning for practical reasons was beneficial. Each noted

that education must not always possess a theoretical or formal educational process for students to learn (Houle, 1961; Tough, 1967).

Experience plays an important role in adult learning (Houle, 1961; Knowles, 1975). Past experiences do not always have a positive influence on the adult's response to education, frequently resulting in "either avoiding it [learning] or coming to it with positive or negative feelings" (Smith, 1982, p. 41). Yet, indisputably, adult experiences are involved with learning to the degree that it has been said, "Experience is the adult learners' living textbook" (Lindeman, 1926/1961, p. 7).

Along with experiences, critical thinking can also be utilized in real-life situations (Brookfield, 1987). To utilize critical thinking students should (a) identify and challenge assumptions, (b) challenge the importance of concepts, (c) imagine and explore alternatives, and (d) use reflective skepticism throughout the learning process (Brookfield, 1987, p. 7). Undergoing critical self-reflection allows students to look at what they believe and, possibly, why they believe it.

To apply these concepts to learners, Tough (1967) asks, "To what extent do schools and colleges actually increase the student's skill in planning and conducting the

sorts of learning that will be important for him after he finished his full-time schooling" (p. 56). More importantly, can students decide upon a learning task that will help them in the future after school? Does a student have the ability to judge the time and cost involved or even the benefits of the learning project? "Unfortunately the typical full-time student receives very little practice in these skills because he rarely has much real choice about whether and what to learn" (Tough, 1968, p. 56). Typically students studying health care do not have much control over what they learn; however, they do have a say over how they approach a learning task.

Adult Education

In order to determine the role that adult education techniques can play in reducing student stress, it is important to explore the adult education concepts of learning how to learn, real-life learning, and lifelong learning. Adult education has been given various definitions and has undergone so much discussion that many educators often agree to disagree. Even though adult education is well rooted in history with such organizations as the Junto and Chautauqua, the core characteristics that distinguish adult education from other types of education are still being questioned today.

Remarking on the powerful stance of adult education, Lindeman stated that in "adult education, one begins to learn after prolonged observation, [it] has not merely changed citizens from illiteracy to literacy; it has rebuilt the total structure of life's values" (1926/1961, p. xlii). However the meaning of adult education is interpreted, the process of how adults learn warrants additional scholarly debates and discussions.

The basic universality for the field of adult education is its multiplicity. This field is defined from multiple perspectives. Smith's (1982) definition of adult education refers to "a purposeful effort to foster learning by persons who have become largely responsible for their own comings and goings" (p. 38). Other terms commonly used to refer to the education of adults are adult learning, continuing education, real-life learning, lifelong learning, and community education (Darkenwald & Merriam, 1982, p. 8).

As complex as the term adult education is, even greater discourse exists on what constitutes an adult. Some argue that an adult is someone 25-years old and older (Maehl, 2000, p. xv). Whereas Smith (1982) resolves that an adult is "the person who regards himself or herself as an adult and has assumed the responsibilities associated

with adulthood" (p. 38). Nevertheless, Smith concedes, "One can learn how to learn more effectively and efficiently at any age" (p. 15).

Learning How to Learn

Robert Smith (1982) defines learning how to learn as "possessing or acquiring the knowledge and skill to learn effectively in whatever learning situation one encounters" (p. 19). Although the tenets of learning how to learn are not new, Smith applies new ideas focused on issues that adult learners can implement in many aspects of their lives, beginning with the principle that "a central task of learning how to learn is developing awareness of oneself as a learner" (p. 57).

Learning how to learn is helpful to people seeking to expand the effectiveness of the learning processes (Knowles, 1990). The three sub processes of adult learning are key elements by which optimal learning can occur (Smith, 1976, p. 6). The three sub processes include the learner's participation in (a) planning, (b) conducting, and (c) evaluating learning activities.

Specifically, planning incorporates the learner's needs and goals personally identified. Secondly, conducting is the learner's way of moving through different stages of the learning activity and using resources. Also

included in this process is incorporating the giving and receiving of feedback. Lastly, evaluating is how the learner measures whether and to what degree goals were met (Smith, 1982, p. 6).

There are three components to learning how to learn. The first component is the learners' needs, or what is it they want or need to know (Smith, 1982, p. 20). Smith (1982) details four types of learners' needs:

1. General understanding provides a foundation for the positive attitude and motivation that learning requires
2. Basic skills are considered learning by listening and viewing, plus by way of reading writing and arithmetic.
3. Self knowledge, which is develop[ing] awareness and understanding of self as a learner
4. Educational processes for three modes of learning is the notion that adults usually learn in one of three contexts: self-directed, collaborative or institutional.
(p. 20-22)

The second component of learning how to learn is learning style, which is the adult's preferential style in how one approaches learning. Learning style is also described by Smith (1982) as "an individual's characteristic ways of processing information, feeling and behaving in learning situations" (p. 24). The third component is training, or the way knowledge is provided to the learner. Training is a mechanism for "providing for

learning about learning and for improving learning proficiency" (p. 25).

As many authors before him have wondered, Smith (1982) asks the question "what is learning?" (p. 34). Ultimately, he determines that learning is "a product, a process, or a function" (p. 34). Learning as a product is said to focus on outcomes. The concern is on the end result. The learner looks to determine what resulted from the outcome of the learning. For example, does the learner know the definition of particular science terms or have the skills to accomplish a set task?

Learning as a process is the description of what occurs while the learning is happening (Smith, 1982, p. 34). This function is not concerned with an end result but with the process itself. Learning as a function concentrates on specifics that help produce learning. In focusing on the aspects of learning like motivation, participation, or change, the function of learning can become clearer (p. 34-35).

To help adult learners better understand themselves, Smith (1982) introduces six optimum conditions for learning:

1. Students feel the need to learn and have input into what, why, and how they will learn.

2. Learning's content and processes bear a perceived and meaningful relationship to past experience and experience is effectively utilized as a resource for learning.
3. What is to be learned relates optimally to the individual's developmental changes and life tasks.
4. The amount of autonomy exercised by the learner is congruent with that required.
5. Students learn in a climate that minimizes anxiety and encourages freedom to experiment.
6. Their learning styles are taken into account. (p. 47-49)

Although health care professional students have demonstrated a strong academic background, the concept of learning how to learn is one that can lead to greater understanding of personal needs as learners. For instance, an awareness of one's own learning strategy preferences provides opportunities to utilize knowledge to improve learning processes in the classrooms (Munday, D., 2002; Munday, W., 2002). The health sciences professions could benefit from expanding this concept of learning strategy awareness to better assist students during clinical rotations, residencies, and internships.

Lifelong Learning

In his classic work, Lindeman (1926/1961) declared, "Education is life" (p. 4). This provides a starting point for the formal recognition of the concept of lifelong learning. Lifelong learning is "the process of learning

that continues throughout one's lifetime based on individual needs, circumstances, interests, and learning skills" (Merriam & Cunningham, 1989, p. 377). The concept of lifelong learning provides understanding that education is more than what happens in a classroom. It also signifies that learning does not end once a person's academic or traditional schooling ceases. "In an era of breathtaking change, it is truly impossible to acquire early in life the knowledge that adulthood will require" (Smith, 1982, p. 15).

Adults can identify skills that they wish to acquire to address their changing learning needs (Conti & Kolody, 1998, p. 109). In order to do this, adults need to utilize self-directed learning skills. Two adult education authors, Malcolm S. Knowles and Stephen Brookfield, have brought much new knowledge to the field of education with their core concepts of self-directed learning and critical thinking. These two concepts also bring insight to adult learning specific to health care professional students.

For graduate students, the ability to "develop their own competence as learners" is vital to succeeding in health care programs and ultimately in the professions. Knowles' (1975) definition of self-directed learning emphasizes the importance of the individual.

In its broadest meaning, "self-directed learning" describes a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. (p. 18)

Knowles' (1980) mission of producing competent people is understood in the statement that "the foundational competence all people must have is the competence to engage in lifelong self-directed learning" (p. 19). "Once adults make the discovery that they can take responsibility for their own learning. . . . they experience a sense of release and exhilaration" (p. 45). In essence, adult learners who have the capacity to self-direct will typically connect meaning to their education or learning task because they participated in the process. Self-directed learning is highly significant learning because it occurs when adults question their ways of thinking and behaving in their personal relationships (Merriam & Cafferella, 1999, p. 291).

Also students who have developed critical thinking abilities typically consider other perspectives and remain open to new ideas (Brookfield, 1987). "Engaging in the critical self-reflection that may lead to changes in a perspective is, in itself, a process that requires self-

awareness, planning, skill support and discourse with others" (Cranton, 1994, p. 144). "Having decided on the worth, accuracy, and validity of new ways of thinking or living, we begin to find ways to integrate these into the fabric of our lives" (Brookfield, 1987, p. 27). This integration is best accomplished when a learner is able to reflect upon past experiences.

Reflective Practice

John Dewey's (1938) classic writing, Experience and Education, centers on the association of life experiences and a person's ability to learn from them. There is great "potential of learning from experience; not all experience leads to learning" (Merriam & Caffarella, 1999, p. 225). Experience is key when learning to be a reflective practitioner.

Reflective practice is when people make decisions based on personal experiences and previous learning. More specifically, reflective practice is "reflection on their patterns of action, on the situations in which they are performing, and on the know-how implicit in their performance" (Schon, 1983, p. 55). For many students the ability to reflect must be developed and encouraged. This process can be difficult if the instructor has not developed a personal ability to critically reflect.

Schon's (1987) reflection-in-action is commonly associated with professional practice and basically involves thinking about "what we are doing while we are doing it" (p. 26). In other words, being quick on your feet and 'keeping your wits about you' are also expressions used as examples of reflection-in-action in the literature (Schon, 1983, 1987). An example of reflection-in-action is having the awareness of one's learning strategy preference and then making necessary adjustments as to better meet one's needs.

Current ongoing research with health care education students, specifically, physical therapy learners' self-assessment abilities were associated with Schon's (1987) adult learning concept of reflective practice (Musolino, 2000, p. 37). Mental health care programs as well as general health care programs are looking to reflective practice to "develop and test new approaches to professional education that would address issues of team capacity and readiness to learn" (Wilshaw & Bohannon, 2003, p. 33). Reflexivity and thoughtful practice are important elements to providing effective health care and to improving higher education in general (Glen, 1995; Jarvis, 1992). Students who learn reflective practice can benefit

greatly when the critical review is proactive and assumptions are challenged.

Recognizing that learning does not always take place in the classroom and knowing that "adults grow as learners because of their life experiences" is the essence of an adult educator (Knowles, 1998, p. 159). As for students preparing for careers in the health science professions, a great educational philosophy to possess and share is that "the whole of life is learning, therefore education can have no endings" (Lindeman, 1926/1961, p. 5).

Focus Groups

Two popular qualitative research methods used in the social sciences are focus groups and interviews (Patton, 1990, Morgan, 1988). With origins in sociology, focus groups resonate in the area of market research (Morgan, 1988, p. 10). Robert Merton and colleagues produced a classic work entitled "The Focused Interview" in 1956, which sought the opinions of radio listeners (Stewart & Shamdasani, 1990, p. 9). Today, focus groups are still widely used in marketing research (Greenbaum, 1998). The intent of marketing research focus groups is different from that of academic-related focus groups (Krueger & Casey, 2000, p. 7). Marketing groups typically benefit from significant funding, use visual aids to influence the

participants, and are interested in selling a product. Those in social science or academics usually work with a limited budget and are interested in data results, which can be used to answer a question, rather than in selling a product or service (Morgan, 1988, p. 10).

For informational gathering purposes, most qualitative researchers rely on interviews. The term focus group is often linked with the term interview (Gay, 1996, p. 224). In actuality, focus groups are "group interviews. . . . which involve a small number of people who have something of interest in common" (p. 224). Both methods, interviewing and focus groups, can produce rich data that afford the researcher numerous personal experiences for study (Zemeke & Kramlinger, 1982, p. 85).

Focus groups are "a carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment" (Krueger, 1994, p. 18). A typical focus group involves between 6 and 12 people and includes a moderator to assist in discussing a particular topic or groups of topics (Gay, 1996; Zemke & Kramlinger, 1982). The size of a focus group is important for several reasons, including efficiently managing the group, observing the interaction between participants, and collecting participants' spontaneous

responses (Morgan, 1988, p. 18). Focus groups larger than 12 people tend to "limit each person's opportunity to share insights and observations" (Krueger, 1994, p. 78).

A tactic to determine whether to conduct a focus group is "to ask how actively and easily participants would discuss the topic of interest" (Morgan, 1988, p. 23). Focus groups are flexible tools in that they "can be adapted to obtain information about almost any topic in a wide array of settings and from very different types of individuals" (Stewart & Shamdasani, 1990, p. 140). Thus, with an endless supply of topics, focus groups are gaining in popularity among many researchers (Patton, 1987).

Focus groups that experience high levels of participant involvement are usually preferred. This is due to the "explicit use of the group interaction to produce data and insights that would be less accessible without the interaction found in a group" (Morgan, 1988, p. 12). Specifically, the researcher can learn from the interaction of the participants as they discuss the topic. When focus group participants are allowed to explore topics, it may appear that less control is available to the moderator (Morgan, 1988, p. 18).

Basically focus groups are dealing with "topics supplied by the researcher, who typically takes the role of

a moderator" (Morgan, 1988, p. 10). A moderator's goal is to "get closer to participants' understanding" on the particular research topic (p. 24). The idea is to try and learn not only what they think or know but also to ask why it is they think a particular way.

In focus groups, the questions are typically predetermined, open-ended, and carefully planned according to the study. A moderator should not seek consensus with the focus group nor encourage debate over the questions (Krueger & Casey, 2000; Stewart & Shamdasani, 1990). Focus group questions should:

1. Sound conversational
 2. Use words the participants would use when talking about the issue
 3. Be easy to say
 4. Be clear
 5. Be short
 6. Usually be open-ended
 7. Usually be one-dimensional
 8. Include clear, well-thought out directions.
- (Krueger & Casey, 2000, pp. 41-42)

The researcher's potential analyzable data relies greatly upon the quality of the question. Not only are the questions important, but they also are "the key to obtaining rich and valid insights" (Stewart & Shamdasani, 1990, p. 30).

Several skills are important to becoming an effective moderator and individual characteristics or traits of an

effective moderator can be learned (Krueger & Casey, 2000; Merriam, 1998). If the moderator does not appear to be interested or attentive, it is doubtful the participants will be eager to divulge personal information. Moderators' respect for participants may be one of the most influential factors affecting the quality of focus group results (Krueger & Casey, 2000, p. 97).

Other important characteristics of a moderator can be considered common sense because they are so basic, yet they remain vital to successfully conducting a focus group. An important characteristic is belief in the participants. One must trust that the participants have wisdom about what is being asked. Moderators should also have adequate background knowledge and be able to communicate both orally and in written formats. A positive attitude and a sense of humor are also effective as the moderator interacts within the group (Krueger & Casey, 2000, pp. 97-99).

A recommended pattern for introducing the group discussion can help the moderator begin smoothly. The pattern includes, "the welcome, the overview of the topic, the ground rules, and the first question" (Krueger & Casey, 2000, p. 107). It is important to expect differences between groups, yet remaining focused will enable the

researcher better opportunities for comparison and group analysis.

Moderators usually refer to an interview guide when conducting the focus group. This guide is a "list of questions you intend to ask in the interview" (Merriam, 1998, p. 81). It is also important for the moderator to help participants feel comfortable discussing their views on the topic (Krueger, 1994; Stewart & Shamdasani, 1990).

A good moderator makes it clear to participants that he or she wants to learn from them. The moderator realizes the importance of striving to have all persons in the group respond, because all experiences of those present are important. Assuring the participants of confidentiality is another important step to securing trust when conducting focus groups (Merriam, 1988).

The moderator must also consider to what extent the participants have been influenced by the moderator or by another group member. To help control this, "the researcher seeks primarily to identify evidence that repeats and is common to several participants" (Krueger, 1994, p. 153). The researcher's objective should be to learn about things that the group feels are important; however, "the amount of direction provided by the interviewer [moderator] does influence the types and

quality of the data obtained from the group" (Stewart & Shamdasani, 1990, p. 11). Ultimately a balance between the researcher's influence and group members' influence is desired.

Self-Assessment

It has been argued that self-assessment is essential for self-reflection and appraisal (Braskamp & Ory, 1994). The majority of literature in the areas of education and self-assessment relates to collegiate instruction and its faculty members. Their self-assessment is utilized in teaching performance and evaluations. In relation to faculty self-assessments, "self-appraisals have sufficient credibility and trustworthiness to warrant their use, particularly to help faculty engage in an ongoing program of self-monitoring and improvement" (p. 103).

Brookfield (1986) denotes how the terms "assessment" and "evaluation" are often used interchangeably (p. 264). He contends that the two terms are very different and that with evaluation, judgments are made. For students, self-assessments hold many unique opportunities toward greater understanding about learning and individuals.

In a recent study with physical therapy students, a self-assessment tool proved to improve students' abilities to identify problems and promote organized thinking

(Carlson, 1999, p. 41). This study also revealed that students who practiced self-assessment were better equipped to be self-directed in their learning tasks (p. 41). By utilizing self-assessment by means of student questionnaires, colleges and universities can glean information regarding student choices, learning patterns, and individual perceptions.

CHAPTER 3

METHODS AND PROCEDURES

Introduction

A core subset of students was solicited for their participation in this study that sought to understand the relationship of stress to learning. Information gathered from 165 full-time students at The University of Oklahoma-Tulsa (OU-Tulsa) served as the data for this study. Data were collected related to learning strategy preference, stress, and demographic and academic variables. Learning strategy preferences were identified with ATLAS (Assessing the Learning Strategy of Adults), and stress was measured with the SSI (Student-life Stress Inventory).

The collection of student data was completed before or immediately following class. Students who provided their first and last names received an e-mail invitation to participate in a learning-strategy-specific focus group session. Data analysis was performed using the Statistical Package for the Social Sciences (SPSS). Frequency distributions were used for both the demographic and academic variables. A chi-square test was used to analyze this study's frequencies compared to the norms for ATLAS. In addition, multiple one-way analyses of variance procedures were conducted to investigate relationships

between learning strategy preferences, stress, and the demographic and academic variables.

Population

In educational research, one typically first identifies a problem for study, and then the study's population. A population is a group that has a similar set of characteristics and is the group to which the researcher would like the results of the study to be generalities (Gay, 1987, pp. 102-103).

A good sample is representative of the population from which it was selected. The target population for this study was graduate students enrolled in Health Care Professional programs at The University of Oklahoma Health Sciences Center in Tulsa. There were 338 students enrolled on the OU-Tulsa campus in the health science fields for the academic year 2001-2002. A total of 165 students volunteered to participate in the study.

Only students who were enrolled full-time in the health science disciplines were asked to volunteer their participation for this study. The disciplines were Allied Health, of which students study physical and occupational therapy, Medicine, Nursing and Public Health. Demographic data was gathered prior to administering the instruments for this study. Students were asked to provide information

related to, age, gender, race, average hours employed per week, and average hours studying per week. Other information collected included academic program information and current year in program.

Design

When conducting a descriptive research study, researchers most often utilize qualitative data. Qualitative research has been referred to as an umbrella concept due to the variation in data collection and range of topics (Merriam, 1998; Patton, 1987). This form of research is a "concept covering several forms of inquiry that help us understand and explain the meaning of social phenomena with as little disruption of the natural setting as possible" (Merriam, 1998, p. 5). Qualitative researchers from the social and behavioral sciences typically "concern themselves with issues related to human behavior and functioning" (Strauss & Corbin, 1990, p. 19). Qualitative research wants to understand and study people's unique feelings, thoughts, and intentions about the world in which they live (Merriam, 1998; Patton, 1990).

To undertake a descriptive research study, the researcher's desire is often to try and see what the participants see. Further, the wish is to understand and learn from what exists in the participants' world. This

study was conducted to describe the profiles of health care professional students in programs at OU-Tulsa. Also to investigate if a relationship of the student profiles and student stress levels exist. For comparison purposes, data were collected on other health care professional students on the campus of OU-Tulsa in areas of medicine, nursing, and public health as well as the allied health students.

This study used a descriptive design. The variables include the learning strategy preferences of health care professional students at OU-Tulsa, and graduate student stress levels. A descriptive study:

Determines and reports the way things are. . . .
. Typical descriptive studies are concerned with the assessment of attitudes, opinions, demographic information, conditions and procedures. Descriptive data are usually collected through a questionnaire survey, interviews, or observation. Just as the historical researcher has no control over what was, the descriptive researcher has no control over what is, and can only measure what already exists. (Gay, 1987, p. 189)

Using both qualitative and quantitative methodologies, the learning strategy preferences of students enrolled on the OU-Tulsa campus was explored. The Assessing the Learning Strategy of Adult Students (ATLAS) and the Student-life Stress Inventory (SSI) provided quantitative data, and multiple focus groups supplied qualitative data. The University of Oklahoma students were asked to

voluntarily participate in this study. Nine focus groups were conducted with the learning strategy preference groups of Navigators, Engagers, and Problem Solvers, which produced detailed, qualitative information. The qualitative responses were profiled to uncover themes and to allow comparisons of similarities and differences.

ATLAS

The Assessing the Learning Strategies of Adults (ATLAS) is an instrument designed to identify learning strategy profiles quickly and simply (Conti & Kolody, 1998). ATLAS was the first instrument administered to the health care professional students. ATLAS is printed on color-coded paper and bound in a horizontal flip, booklet format. After selecting one or more colored cards with the brief statements with which the reader most closely identifies, participants discover their learning strategy group as a Navigator, Problem Solver, or Engager. After only minutes required to complete the ATLAS, students' learning strategies are characterized as follows:

The Navigators and Problem Solvers initiate a learning task by looking externally to themselves at the utilization of resources that will help them accomplish the learning. Engagers, on the other hand, involve themselves in the reflective process of determining internally that they will enjoy the learning task enough to finish it. . . . Navigators are much more concerned than Problem Solvers with

identifying exactly what needs to be learned
and on designing a plan for the learning. . . .
Problem Solvers are more concerned with
identifying a variety of solutions for the
learning task. (Conti & Kolody, 1999 p. 18)
The ATLAS instrument has been used in numerous

doctoral dissertations to study various groups from high
school noncompleters (James, 2000), first-time college
students (Willyard, 2000), physical and occupational
therapy students in their first year (Chesbro, 2000), and
eBay auction participants (Ghost Bear, 2001). Each
doctoral dissertation utilized ATLAS in attempts to
understand the role learning strategies play as students
complete learning tasks.

ATLAS is a valid instrument for measuring the learning
strategy preferences of professional health care students
(Conti & Kolody, 1998). Validity refers to "the degree to
which a test measures what it is intended to measure" (Gay,
1987, p. 553). In addressing validity, there are three
important types. They are construct validity, content
validity, and criterion-related validity.

Construct validity is known as "the degree to which a
test measures an intended hypothetical construct" (p. 131).
ATLAS is based on research findings of the Self-Knowledge
Inventory of Lifelong Learning Strategies (SKILLS) and
brings with it construct validity. The construct validity

of ATLAS was established by integrating the results of many research studies using the SKILLS and fusing together these results (Conti & Kolody, 1999, p. 18). The construct validity of ATLAS was established by reviewing the literature of studies actually using SKILLS in field-based research and by consolidating the similar data from many studies (p. 18).

Content validity is "the degree to which a test measures an intended content area" (Gay, 1987, p. 129). The content validity for ATLAS was established by utilizing discriminate analyses to identify learning strategies used by each group of learners when compared to other groups of learners (Conti & Kolody, 1999, p. 19). The results of these discriminate analyses were used to write each item in ATLAS. The accuracy of the discriminate analyses that were used to separate the three learning strategy preference groups were as follows: 96.1% between the Navigators and Problem Solvers as one group and the Engagers as the other group and 98.3% between the Navigators and Problem Solvers (p. 18). The distributions of the respondents among the three groups were as follows: Navigators—36.5%, Problem Solvers—31.7%, and Engagers—31.8% (p. 18).

Criterion-related validity is "validity [that] is determined by relating performance on a test to performance

on another criterion (Gay, 1987, p. 543). Criterion-related data on the ATLAS is still being collected. Results from previous studies using the ATLAS "verify at least 90% of participants agree that ATLAS correctly identifies their learning strategies" (Ghost Bear, 2001, p. 83). Consequently, to compare the learning strategy on ATLAS to the criterion-related data, health care professional students were asked to confirm if their ATLAS grouping was accurate in describing their learning strategy. Similar to other studies, 91% of the students felt their ATLAS score accurately described their learning preferences.

A test is considered to be reliable when the "test consistently measures whatever it measures" (Gay, 1987, p. 135). A reliable test indicates the same results are reached each time the test is administered (p. 135). Furthermore, "reliability is not prized for its own sake but as a precondition for validity" (Lincoln & Guba, 1985, p. 292). When a researcher places "effort in shoring up validity, reliability will follow" (Guba, 1978, p. 71). In one study ATLAS had a reliability of .87 in test-retest examinations on time periods of one-week to three-weeks (Ghost Bear, 2001, p. 85).

Student-life Stress Inventory

Immediately following the administration of ATLAS participants were asked to self assess their level of stress as either mild, moderate, or severe. Then the Student-life Stress Inventory (SSI) was administered. The SSI is an instrument specifically developed to accurately measure student's stress. In the development of the SSI, a model described by Morris (1990) was used, and then small groups of students met to discuss the types of stressors students experience and their reactions to the stressors (Gadzella, 1993, pp. 301-307).

The SSI is a paper and pencil questionnaire with 51 items that takes approximately 15 minutes to complete (Gadzella, 1991). Participants report responses on a 5-point Likert scale with 1 = Never, 2 = Seldom, 3 = Occasionally, 4 = Often, and 5 = Most of the Time. The scores on the SSI can be divided into two groups and nine subcategories: (a) Stressors: frustrations, conflict, pressure, change, and self-imposed, and (b) Reactions to Stressors: physical, emotional, behavioral, and cognitive (Gadzella, 1994).

For construct validity, "the confirmatory factor analyses buttressed the notion that the SSI is a valid measurement instrument in determining college students'

stressors, reactions to stressors, and their overall stress index" (Gadzella & Baloglu, 2001, p. 84). This self-reporting instrument measures student stress levels as they relate to their life experiences (Gadzella, 1993, p. 396). Life experiences are believed to be important in obtaining accurate stress levels (Gadzella & Baloglu, 2001; Mosley et al., 1994). For this study, life experiences were also discussed further in focus group sessions.

Content validity for the SSI was reported in 1993 using analyses of variance to confirm significant differences among the students for the stress levels on the nine categories (Gadzella & Baloglu, 2001, pp. 84-94). Criterion-related validity for the SSI has not been reported to date.

Focus Groups

As a research method, focus groups have a basic purpose that shapes the questions asked utilizing group discussion. For this study, focus groups were conducted in a small conference room on the campus of OU-Tulsa. At the beginning of each session, introductions were made and the researcher clarified how confidential issues of this study would be maintained. Furthermore students were assured that names would not be used in the text, comments about professors and specific academic information would be kept

confidential. The researcher inquired about concerns of the focus group participants at the beginning of the session. Each focus group session lasted 90 minutes with 1 hour allotted for discussion and 30 minutes for questions.

A total of nine focus group sessions were conducted. One focus group was conducted with each of the three learning strategy groups: Navigators, Problem Solvers, and Engagers. The data collected assisted in describing the strategy preferences of the health care students at the University of Oklahoma in Tulsa, including their attitudes about stress. Students were selected to participate in the focus groups using the responses on the answer sheet data forms previously collected. This data form listed students' learning strategy preferences and results of the Student-life Stress Inventory along with basic demographic information. The students were easy to locate since "participants are selected because they have certain characteristics in common that relate to the topic of the focus group" (Patton, 1990, p. 4). Participants volunteered to attend a focus group specific to their learning strategy preference, thus the size of focus groups varied.

The following questions were discussed during the focus group sessions:

1. Think about a learning project you were involved in the past year. What actions did you take to help yourself accomplish that task?
2. Think of a stressful experience you had in the past year? Why was it stressful?
3. How did you deal with that situation?
4. What kinds of things exist in your program that help you deal with stress?
5. What changes in your program or academic environment would you like to see?

As the researcher strives for the complete picture of the adult learners in The University of Oklahoma health care professional programs, focus groups produced qualitative data in an attempt to understand stress and its effect on learning. Focus groups describe, "What people's lives, experiences and interactions mean to them in their own terms and in their natural settings" (Patton, 1990, p. 22).

The analysis of the focus group data were completed by transcribing each focus group session, and the responses were themed. This process occurred by reviewing the transcriptions and seeking out response similarities. All 6 focus group questions were entered into an excel spreadsheet for each focus group. A peer group meeting was set to review results and focus group findings were merged locating additional themes. The focus group themes were not preconceived.

Focus groups may not always be the preferred method in collecting qualitative data. Many advantages exist in the focus group method such as "the ability to conduct the research with less in the way of a prepared interview. Of course the price one pays for this approach is relatively chaotic data collection" (Morgan, 1988, p. 18). This study of stress and health care students sought to compare answers to semi-structured questions asked during the focus group sessions.

Graduate Programs at OU-Tulsa

On The University of Oklahoma-Tulsa (OU-Tulsa) campus several health science center programs are housed. These include pharmacy, public health, nursing, medicine, physical therapy, and occupational therapy. In this unique setting, these professional students complete course work in one central building as compared to many medical education settings where each program is isolated.

The health science programs at the Tulsa campus of The University of Oklahoma are typically 3-4 year programs, which is in addition to undergraduate coursework. Each program year of education may have different or unique stresses found in the various disciplines. Generally, the first year is heavily focused in the classroom, featuring mostly lecture-based curriculum. Extensive testing, which

can bring about certain stressors, is done to monitor student successes. While the second year remains focused on the classroom, students are gradually introduced into clinical situations and real-life learning circumstances. In the third and fourth years, students find themselves moving away from the classroom and toward providing direct patient care. Also many preparatory objectives for national exams and certifications occur at this time. Data were collected from four colleges at OU-Tulsa: Allied Health, Medicine, Nursing, and Public Health. Although all are medical programs, the following synopsis of the variances of curricula reveals how the different programs find students experiencing stress at various times.

College of Allied Health

The College of Allied Health in Tulsa offers a Master of Physical Therapy (PT) and a Master of Occupational Therapy (OT) degree. The Physical Therapy program is designed to teach students to "improve the ability of an individual of any age to function successfully regardless of the reason for disability: disease or trauma, developmental or acquired, acute in nature or chronic" (College of Allied Health brochure, 2002, p. 1). While also focusing on the rehabilitation of individuals, the Occupational Therapy program instills in students that "by

preventing, reducing or overcoming physical, social, and emotional impairments in people, occupational therapists help to restore and sustain the highest quality of productive life to persons of all ages" (College of Allied Health brochure, 2002, p. 1).

Admission for the OT and PT programs require 90 hours of coursework including science prerequisites specific to anatomy and physiology. The Graduate Record Examination (GRE) is also an admission requirement including a written assessment. Qualified students then are invited for a personal interview conducted by selected professors and students.

The OT and PT degree programs are similar, both involving eight semester curricula, that require 3 years to complete. The curricula for the OT and PT programs are delivered via distance education in the form of live interaction television with instruction originating from each alternating site: Oklahoma City and Tulsa. A large portion of the curriculum relies on laboratory or hands-on training. Both programs also involve clinical components that increase in length with the progression of the program. The first and second years are predominately didactic with limited clinical rotations. The third and

final year of the program place a strong emphasis on clinical learning with a rotation lasting 16 weeks.

Graduates from accredited programs in PT and OT are eligible to sit for national certification examination after meeting state licensure requirements. The licensure examinations typically occur within 8 weeks of graduation. Licensed physical and occupational therapists are employed in hospitals, clinics, home health agencies, private practice, school systems, and corporations.

College of Nursing

The graduate nursing students who participated in this study are classified as Registered Nurse (RN) who are pursuing a Master of Science (MS) degree. The Master of Science degree prepares students for leadership positions in professional nursing practice. The master's program has a specialized curriculum that is divided into career or leadership pathways. At the time of application, a student must choose one of the four leadership pathways:

Administrator-Manager, Clinical Nurse Specialist, Nurse Practitioner, or Teacher-Educator.

Admission into the program requires an associates degree or higher in nursing, completion of required prerequisites, and a current Oklahoma licensure as a Registered Nurse. Dependent upon the pathway selected, the

curriculum consists of 38 to 52 semester hours of academic credit. "The majority of nursing graduate students who enter the program as Registered Nurses complete the degree through part-time enrollment" (College of Nursing Brochure, June 2000, p. 1). Although students may pursue the program on a part-time basis, requirements for the degree must be completed within 6 years. The curriculum is delivered via distance learning, including interactive video broadcasts and Internet-based courses.

Except those in the management-administration pathway, students focus on a clinical area of nursing practice. The clinical areas vary including areas such as gerontological nursing, pediatric nursing, and psychiatric-mental health nursing. Nursing students must select either a thesis or synthesis option in order to graduate. The thesis option is a research project on selected topics such as wellness and health promotion. The synthesis option is a comprehensive examination that must be defended before a committee.

Licensure as an RN is established before admission; however, the Nurse Practitioner graduates must pass a national certification exam in order to practice. Nursing graduates are employed in various settings including hospitals, clinics, physician offices, independent health consultants, and community health organizations.

College of Medicine

The Doctor of Medicine program is housed on a community-based clinical campus that was founded in Tulsa in 1972. The program utilizes 800 clinical volunteer faculty members and employs 65 full-time faculty members (Tulsa option brochure, 2000, p. 1). For admission into the Doctor of Medicine program, students must complete 90 hours of coursework, including science prerequisites and complete the Medical College Admissions Test (MCAT). The MCAT is a 5.75 hours exam testing students in verbal reasoning, physical science and biological science.

The curriculum in medicine is different from the other programs in this study in that all students must complete basic science courses during the first and second years in Oklahoma City only. The first and second years of medical school are predominately didactic. After completion of the first two years, students then have the option to select attending classes in either Oklahoma City or Tulsa for the third and fourth years, which are clinical in nature.

The clinical component provides early patient contact. This patient interaction occurs with supervision as the student performs health care delivery in various settings working beside other practicing physicians and residents. This practice setting is a real-life learning approach to

medicine versus the university hospital settings where the medical student is third or fourth in line to direct contact with a patient following the residents and senior medical students. Tulsa medical students also encounter a wide diversity of patients and health care problems as they learn to adjust to the realities of medical practice. The Tulsa option provides students a community-focused education, including a rural health opportunity in Ramona, Oklahoma, located 25 miles northeast of Tulsa.

In order to graduate, students must pass the United States Medical Licensing Exam (USMLE) Parts I, II and III. Medical school graduates then enter the medical residency programs, which extend the training process another 3 to 7 years.

College of Public Health

The College of Public Health offers a Master of Public Health (M.P.H.) degree. This graduate degree program is a broad-based graduate program designed to prepare professionals to effectively manage future public health challenges. The curriculum has an expansive focus to encompass the changing field of health care, teaching students how to design health care programs and evaluate various health care systems including the management of those systems. Students are also exposed to policy

analysis and to various legal and ethical issues when dealing with health care, including the growing area of financial analysis. The Council on Education for Public Health accredits the College of Public Health programs (College of Public Health brochure, 2002, p. 1).

Students who enter the M.P.H. program typically have a career in the health care field or hold degrees in a health care area. The master's degree program consists of 45-credit hours and does not have regulations on maintaining a full-time or part-time status. Successful admission into the program requires a bachelor's degree with a minimum grade point average of a 3.0 on a 4.0 scale on the final 60 credit hours. The College of Public Health does not encounter much competition, for it is the only school in the state of Oklahoma offering the program in both Oklahoma City and Tulsa.

The M.P.H. program is structured around the working professional in that the course work is offered predominantly in the evenings and on weekends.

Courses are delivered in multiple formats including distance education, formal lecture, and web-based classes. Graduation from the M.P.H. program requires a final paper and a comprehensive exam; however, students do not have any form of licensure associated with this program.

The stress impact on public health students is somewhat different from that found in a typical medical educational setting. A typical public health student has a full-time job, plus the majority of students are pursuing the graduate degree part-time. The stresses for these students might produce different pressures than those of full-time medical students. For example, a lighter course load would produce less academic stress, yet financial issues of working and going to school part-time would increase the personal or non-academic stress of the student. A student who is not familiar with the newer technologies in the distance education format may experience tension until he or she becomes comfortable with the format.

Summary of OU-Tulsa Programs

There are many similarities between the health care programs of Allied Health, Medicine, Nursing, and Public Health as well as differences especially in the areas of admissions requirements, enrollment status, course delivery, clinical requirements, and licensure regulations. For instance, differences are found with the requirement of prerequisite coursework before admission into a program. Allied Health, Medicine, and Nursing each require between 60 and 90 credit hours of prerequisites. Many of these

prerequisites are specified with the majority of the courses in the area of biological science. Whereas, a difference is found with the Public Health program for it does not require prerequisites. Public Health requires a bachelor degree in any subject versus specified prerequisites.

The same is true for the requirements of admission testing. The Medical program requires the MCAT (Medical College Admissions Test), and the Allied Health programs require the GRE (Graduate Record Examination) to evaluate candidates at the time of admission. However, Nursing and Public Health do not require testing before admission into programs.

Other differences can be found for enrollment status of students: full-time status or part-time status. Allied Health and Medicine do not allow students to participate in their programs part-time. For these programs the expectation is that school is the priority, and work hours are secondary and even discouraged. In contrast, the fields of Nursing and Public Health often strive to bring real-life experiences of students into the classrooms for use in their programs. The majority of Nursing and Public Health students are working professionals at the time of

enrollment, only participating part-time in graduate programs.

For distance education, the Medical program is in contrast with the other three programs in that they do not utilize distance education. The delivery of courses for Allied Health, Nursing, and Public Health are conducted through distance education often broadcasting in Tulsa and Oklahoma City simultaneously. These programs house faculty on each metropolitan campus. Furthermore the Allied Health and Nursing programs utilize web-based instruction for assignments and e-mail to communicate with students, faculty, and staff members.

Many similarities exist in the area of clinical experiences for the OU-Tulsa graduate students. The Allied Health, Medicine, and Nursing programs each provide extensive clinical components. The Public Health program requires an internship this is referred to as fieldwork. Fieldwork is an administrative internship, which does not have a clinical focus.

Licensure is another aspect where differences are found. Before students are allowed to legally practice in their fields, they must pass national board exams and become licensed. Allied Health, Medicine, and Nursing each require national and state licensure whereas Public Health

does not have requirements at the state or national level. Each of these areas of admissions requirements, enrollment status, course delivery, clinical requirements, and licensure regulations can present varying stress to students.

CHAPTER 4

FINDINGS

It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts.

--Sherlock Holmes

Introduction

The data collection process began with students responding to eight questions specific to the student on an answer sheet provided. ATLAS was administered. The SSI was administered immediately following the ATLAS. All responses were collected on one full-page answer sheet. Each of the ATLAS learning strategy category groups, Navigators, Problem Solvers, and Engagers, comprised a focus group session.

Nine focus group sessions were conducted, three sessions for each group. The sessions were one hour and a half in length, with the final thirty minutes of the session reserved for questions or additional comments from students. Following the sessions, the researcher transcribed the audio taped sessions in order to discover similarities or differences. The constant comparative strategy often associated with Lincoln & Guba's naturalistic inquiry literature (1985) was used to analyze

the transcribed conversations to uncover possible relationships.

Demographic Variables

There were 338 students enrolled at OU-Tulsa in the health sciences during the academic year 2002-2003 (The University of Oklahoma Admissions and Records, 2003, personal communication). Of these, 165 students volunteered to participate in the study. Thus the sample consisted of just fewer than 50% of the entire population of students enrolled in the health sciences at OU-Tulsa. Of the 165 answer sheets, there were four that did not report on all the questions.

The respondents in this study were predominately women, with nearly three fourths, (70.37) of the sample reporting their gender as female (see Table 1). This result is higher than the average for colleges; the Oklahoma Higher Education statistics from the Oklahoma State Regents for Higher Education reported that women make up 55.3% of the Oklahoma college population (OSHRE, 2000, p. 73). While males make up 44.7% of the enrollment in higher education, they represented only slightly over one-fourth of this sample. The number of women who participated in this study was slightly higher than the

state population data. Oklahoma census data for 2000 reports that females compose 50.9% of the total population for the state of Oklahoma (<http://quickfacts.census.gov/qfd/states/40/40143.html>).

The mean age for students enrolled in public education institutions in Oklahoma was 27.11 (OSRHE, 2000, p. 31). The mean age of the participants in this study was 28.26 with a standard deviation of 7.8 (see Table 1). The respondents in this study were generally young, even though students must enter the program with at least 3 years of general or prerequisite coursework. Slightly over half of the students were 25 and under, and yet another one fourth of the participants were not yet 30 years old. Of those represented in the 30 to 55 age group, only 5 students were 50 years old or over. The Oklahoma State Regents for Higher Education statistics in 2000 revealed that only 6.5% of the total higher education enrollment for the state of Oklahoma was persons 50 years old or over (OSRHE, 2000, p. 32).

The ethnic makeup of the sample is representative of the state. According to the 2000 census data for Oklahoma's general population, 76.2% of the total population is white. The Native American population in

Oklahoma is 7.9% of the general population (<http://quickfacts.census.gov/qfd/states40/40143.html>).

The respondents in this study are similar to Oklahoma's general population with over 80% of the respondents who declared their race as white (see Table 1).

The percentage of Native Americans participating in this

Table 1: Frequency of Demographic Variables

Variable	Frequency	Percent
Gender		
Male	48	29.63
Female	114	70.37
Age		
21-23	42	25.77
24-25	43	26.38
26-29	41	25.15
30-55	37	22.7
Race		
African American	4	2.44
Hispanic	2	1.22
Native American	14	8.54
White	132	80.49
Asian	9	5.49
Other	3	1.83
Marital Status		
Single	81	50.00
Not Single	81	50.00

study was slightly higher than the 2000 Native American population statistics for the state of Oklahoma (OSRHE, 2000, p. 32).

Since the majority of participants in this study were relatively young, 77% were under the age of 30, it was not

expected that half of the students were married. Exactly half of the respondents reported their status as not single (see Table 1). This is consistent with the state data for single and not single persons. The 2000 summary data for the state of Oklahoma maintain that 53.5 of the state of Oklahoma population were classified as married-couples (www.factfinder.census.gov). This study's balance of single and not single respondents provided an equal representation for observation to investigate stress and marriage.

Academic Variables

Participants were asked to indicate their year of training status, which ranged from year one to year six. Almost half of the students had completed their first year of training at the time of the data collection (see Table 2). For the first and second year of training students are completing didactic coursework and are often on campus for long periods of time. About one-fourth of the students were in their third year. Students completing years three and four are most often participating in clinical rotations and internships. These rotations and internships provide direct patient care experiences and are rooted in the surrounding community, cities and towns.

The amount of time devoted to study was another question posed to the participants. Slightly over 40% of the students stated they study between 16 and 60 hours (see Table 2).

Table 2: Frequency of Academic Program Variables

Variable	Frequency	Percent
Program		
Medicine	27	16.46
Nursing	24	14.63
Occupational Therapy	15	9.15
Public Health	22	13.41
Physical Therapy	76	46.34
Year in Program		
One	72	46.45
Two	26	16.77
Three	41	26.45
Four	10	6.45
Five	5	3.23
Six	1	0.65
Hours of Study		
None	8	4.85
1-10	62	37.58
11-15	23	13.94
16-20	35	21.21
21-60	37	22.42
Hours of Work		
None	50	30.31
1-10	33	20
11-25	27	16.36
26-40	27	16.36
41-80	28	16.97

Academically, many OU-Tulsa students are devoting the majority of their time to study in attempt to master large amounts of material. Two thirds of the students listed

hours of study in the 1-10 hours range per week, thus leading the researcher to question if students are working while attending school.

Roughly one-third of the students reported that they do not work. Over 70% of students reported their hours spent at work fell within the range of 10-80 hours per week (see Table 2). This provides a wide range of hours spent working and indicates the majority of students are not solely focused on their professional programs.

Learning Strategies

The Assessing the Learning Strategies of Adults (ATLAS) instrument is utilized to place individuals into one of three learning strategy preference groups of Navigators, Problem Solvers, or Engagers. The norms for ATLAS are roughly a proportionate one-third for all three categories; the exact distribution as follows: Navigators-- 36.5%, Problem Solvers--31.7%, and Engagers--31.8% (Conti & Kolody, 1999, p. 18). The distribution for this study differed from the norm; Navigators-- 48%, Engagers-- 32%, and Problem Solvers-- 20% (see Table 3).

Table 3: Observed and Expected Outcomes for ATLAS

Categories

Groups	Observed	Expected	Difference
Navigators	77	58.76	18.24
Problem Solvers	33	51.04	-18.04
Engagers	51	51.20	-0.20

A chi-square test is "a nonparametric test of significance appropriate when the data are in the form of frequency counts" (Gay, 2003, p. 586). Chi-square was used in this study to compare group frequencies to "see if an event occurs more frequently in one group than another" and to "compare proportions actually observed in a study with proportions expected" (Gay, 1987, p. 255, p. 397). There was a significant difference between the expected norms for ATLAS and the observed frequency for the OU-Tulsa students ($X^2 = 12.03$, $df = 2$, $p = .002$). Although this study found similar numbers to the norm of Engagers as expected, there were significantly more Navigators than expected. The most underrepresented group was Problem Solvers, with significantly fewer than expected. Thus, these results are disproportionate to the norms for ATLAS (see Table 3).

Student-life Stress Inventory

The Student-life Stress Inventory (SSI) was developed by Gadzella (1991) and is utilized to study student stress.

Life experience questions found on the SSI are designed to "better understand the situations students encounter in their current learning environments" (Gadzella, 1992, p. 176). The instrument is a 51-item inventory using a 5-point Likert scale: 1 = Never, 2 = Seldom, 3 = Occasionally, 4 = Often, and 5 = Most of the Time. This study analyzes all nine sections of the SSI, plus the Total score, which represents the score from the entire instrument. All of the items are positive except for two. For these, their point values are reversed in scoring. These items were used to calculate several scores for each participant. The Total score was made up of the value for all items. In addition, scales were calculated for each of the nine scales of the SSI. These nine scales form two categories. They are Stressors and Reactions to Stressors (Gadzella, 1991). The items for the Stressors are:

Frustration: 1-7, Conflict: 8-10, Pressure
11-14, Changes: 15-17, and Self-imposed: 18-23.

The items for Reactions to Stressors are:

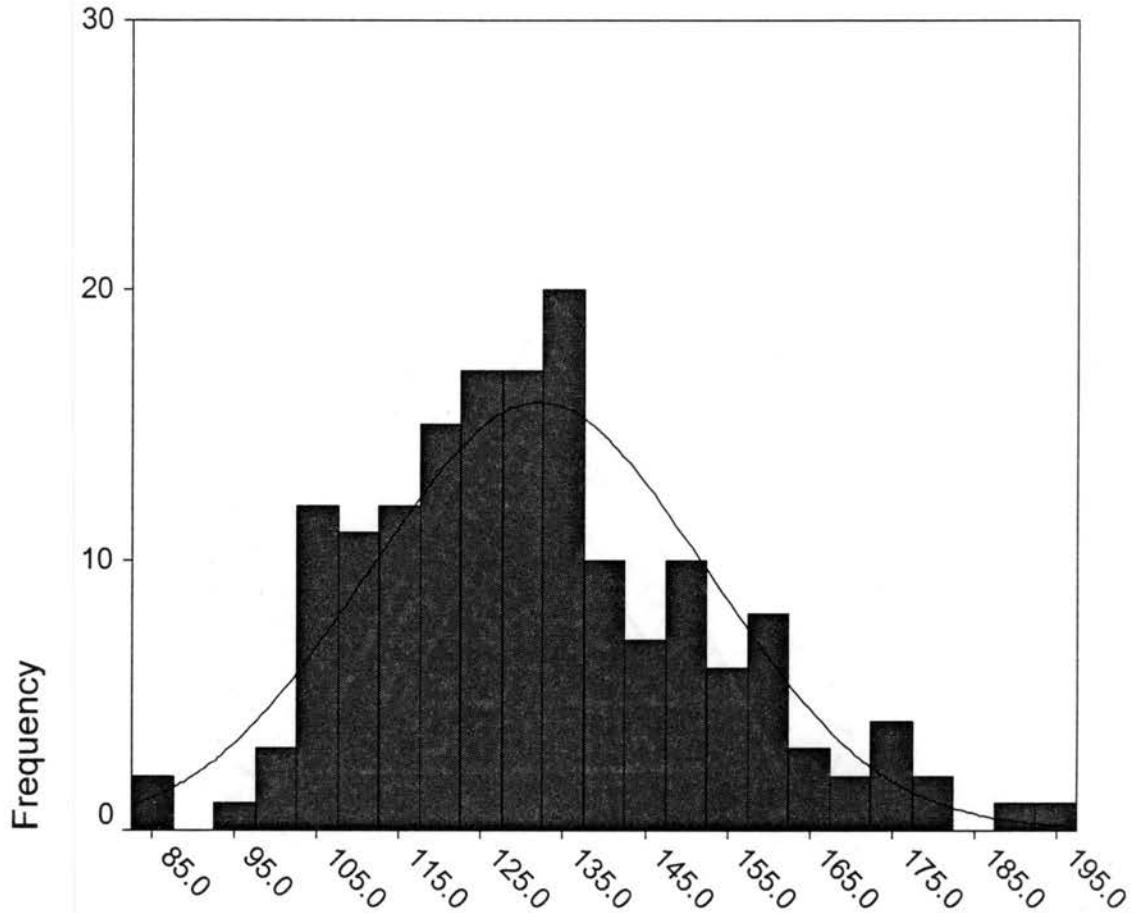
Physical: 24-37, Emotional: 38-41, Behavioral:
42-49, and Cognitive: 50-51.

Total Score

The Total score represents data from all 51 items on the SSI and these provide an overall measure of the participants' general level of stress. Even though the

stereotype of medical school is one of a high stress atmosphere with stressed students, the Total score revealed a distribution that had a wide range and that had a general pattern of a normal distribution. A normal distribution tends to have a bell shape with 68% of the respondents within one standard deviation of the mean, 13.5% of the respondents one to two standard deviations from the mean, and 5% of the respondents over two standard deviations from the mean (Gay, 1987, p. 351). The possible range for the Total score is 51 (1 x 51) to 255 (5 x 51). The participants in this study had a range of 70-193 with an average score of 131.6 and a standard deviation of 21.11 (see Figure 1). With a specified mean of 131.6, the individual average response was 2.58 (131.6/51) on the 5-point Likert scale. Thus, students reported that their Total stress affects them between Seldom and Occasionally on the scale for the SSI.

Figure 1: Distribution for SSI Total Scale



Stressors

The SSI is comprised of nine scales, which are divided simply into Stressors and Reactions to Stressors.

Stressors consists of five scales: Frustrations, Conflicts, Pressures, Changes, and Self-Imposed; Reactions to

Stressors consists of four scales: Physical, Emotional, Behavioral, or Cognitive (Gadzella, 1991).

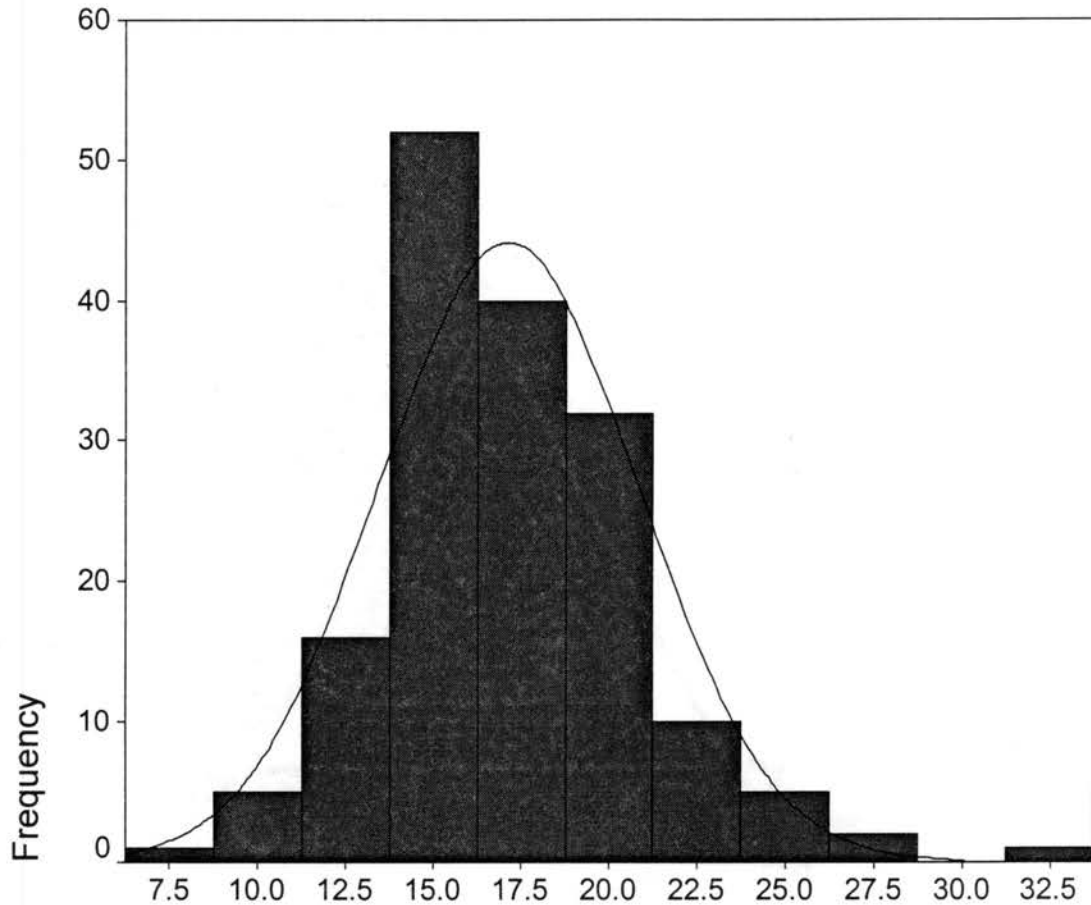
Frustrations are the negative issues when attainment of goals, location of resources, and acceptance are not

favorable to the student. Frustration is also defined as "increased emotional tension due to failure to achieve" (O'Toole, 1997, p. 632). There are 7 items on the SSI that inquire about frustrations with a possible range of 7 to 35. The responses on the Frustration scale ranged 7-32. The mean for the Frustration scale was 17.09 with a standard deviation of 3.72 (see Figure 2).

The frequency distribution for Frustration also was generally bell shaped indicating a rather normal distribution. The average respondent's answer on the 5-point Likert scale was 2.42; like the Total score, the students were distributed over almost the entire range of the scale with an average response between Seldom and Occasionally.

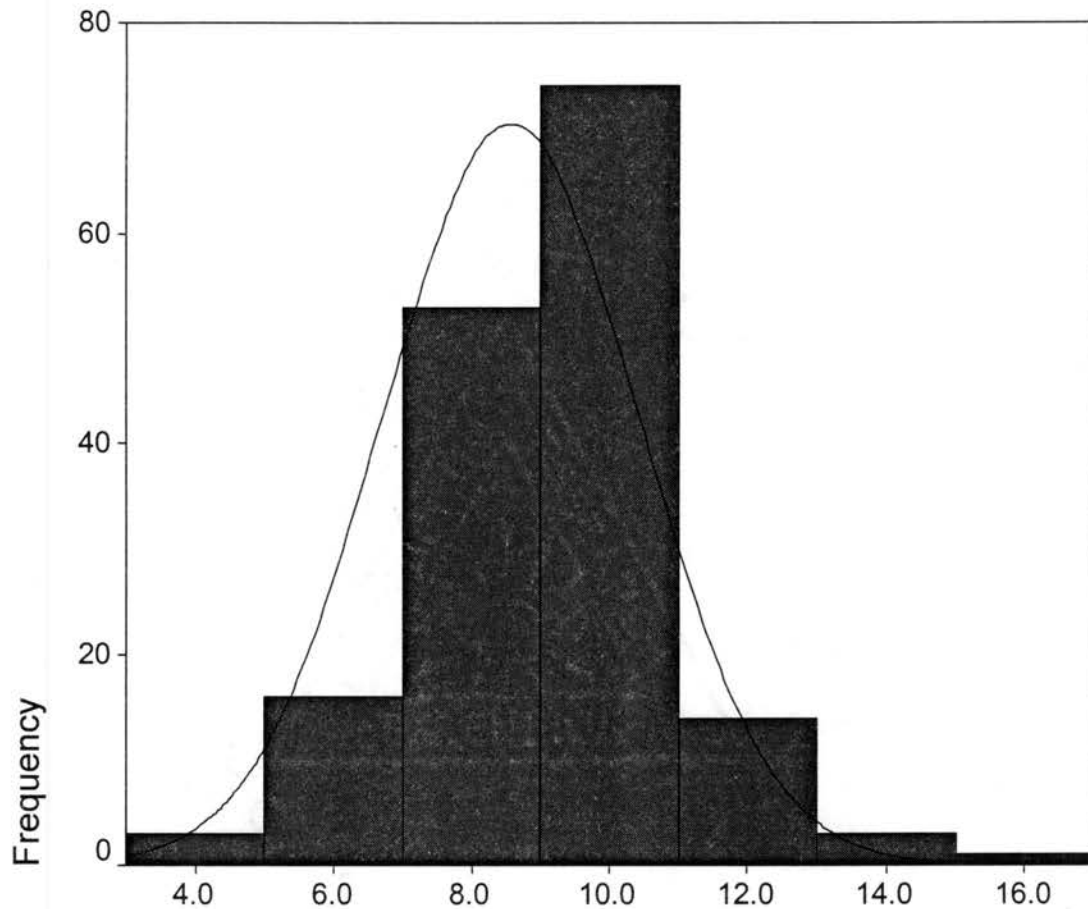
When in conflict, a person is experiencing a mental struggle (O'Toole, 1997, p. 366). The Conflict scale consists of 3 items with a possible range of 3 to 15. These three SSI questions inquire whether students are able to generate multiple solutions when experiencing conflict.

Figure 2: Distribution for SSI Frustration Scale



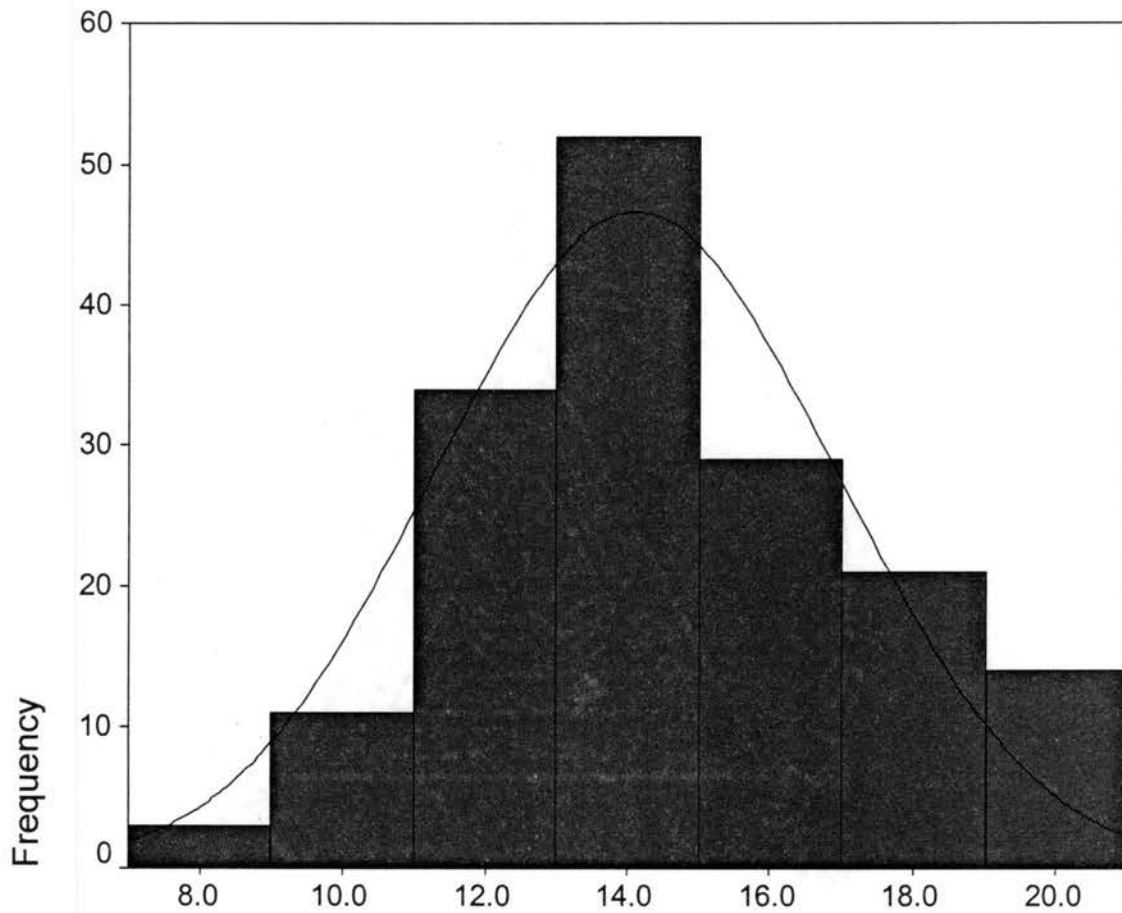
The range of responses for the Conflict scale was 3-15. The mean was 8.56 and has a standard deviation of 1.84 (see Figure 3). The frequency distribution for Conflict was generally normal with a strong emphasis at the mean and a large cluster slightly below the mean (see Figure 3). The average respondent's answer was 2.83, which indicates that students Seldom to Occasionally experience Conflict.

Figure 3: Distribution for SSI Conflict Scale



Pressure is a burden or interference with life situations and is also defined as a stress or strain (O'Toole, 1997, p. 1308). The Pressure scale consists of 4 items with a possible range of 4-20 (see Figure 4). These four questions inquire about Pressure in relation to deadlines, overloaded schedules, and relationships. The range of responses for the Pressure scale was 8-20. The mean for Pressure was 14.11 with a standard deviation of 2.79. The frequency distribution for Pressure was

Figure 4: Distribution for SSI Pressure Scale

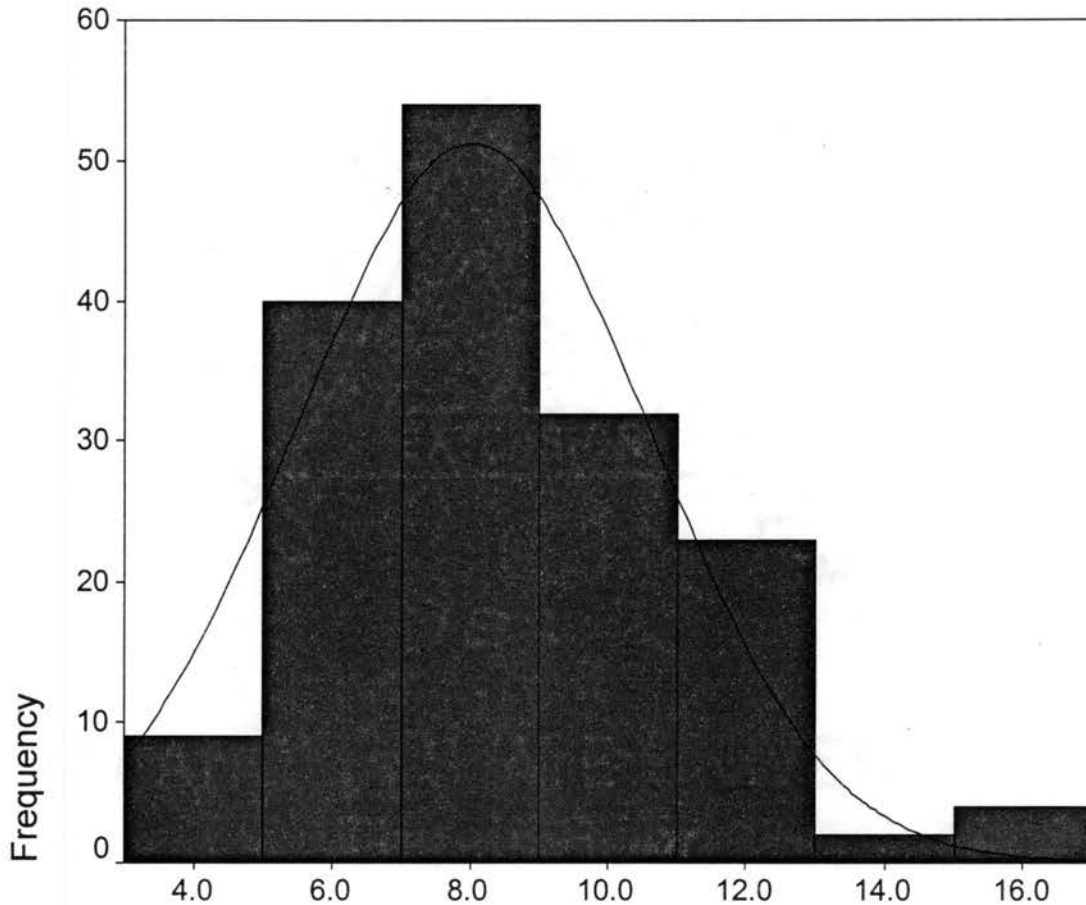


generally normal with a slight cluster just to the left of the mean. The range for Pressure begins at 8, indicating that students are experiencing pressure. The average respondent's answer was 3.52; thus, students state that they experience Pressure from Occasionally to Often.

Change is the "conversion of something to a different form" or to alter (O'Toole, 1997, p. 304). The Change scale consists of 3 items with a possible range of 3-15. These three SSI questions inquire whether Change is

disruptive to the student. The range of responses for the Changes scale was 3-15. The mean for Change was 8.04 with a standard deviation of 2.56 (see Figure 5). The frequency distribution for Change was generally normal with clusters

Figure 5: Distribution for SSI Change Scale

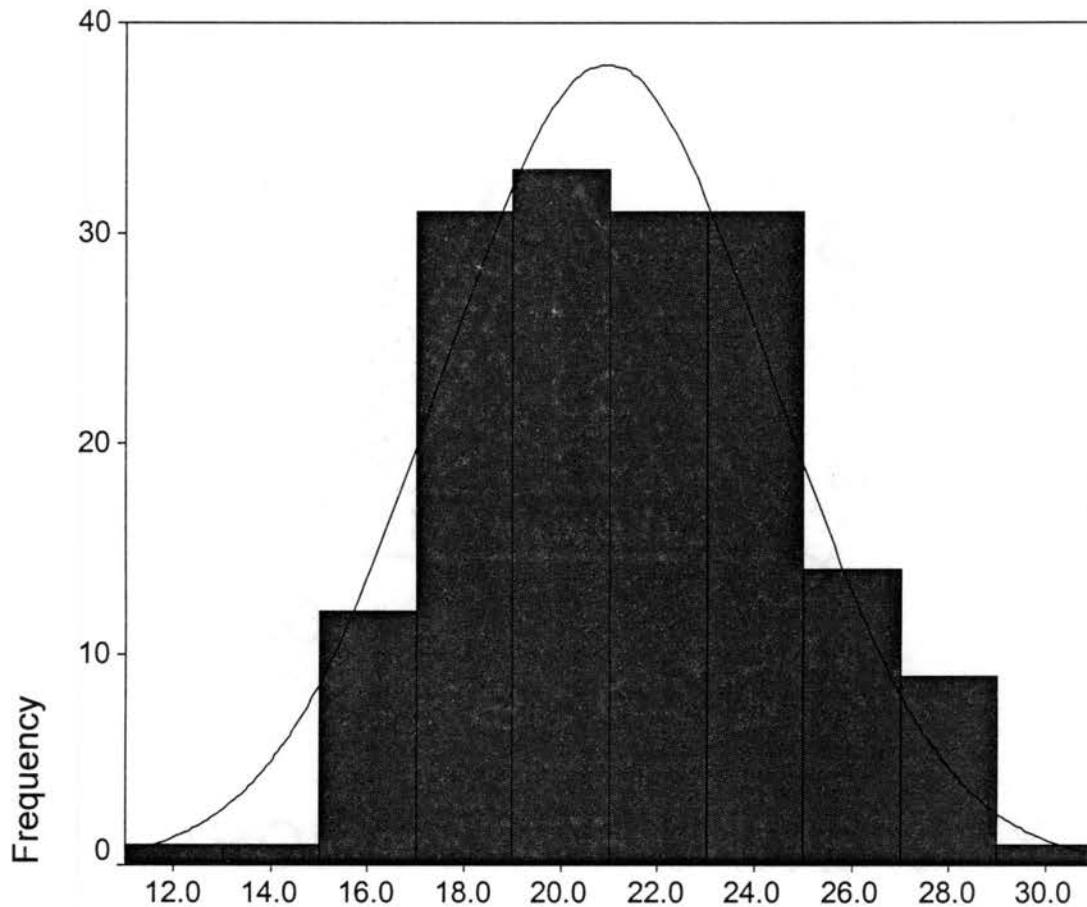


both below and above the mean. The average respondent's answer was 2.68, which indicates that students Seldom to Occasionally experience change.

Self-imposed is a force placed upon the self (O'Toole, 1997, p. 1463). The Self-Imposed scale consists of 6 items

with a possible range of 6-30. These six questions ask students about their tendencies to compete, worry, or procrastinate. The range of responses for the Self-Imposed

Figure 6: SSI Self-Imposed Scale



scale was 12-29. The mean was 20.93 with a standard deviation of 3.42 (see Figure 6). The frequency distribution for Self-Imposed was generally bell-shaped displaying a rather normal distribution. The average respondent's answer was 3.48, indicating that students Occasionally to Often experience self-imposed stress.

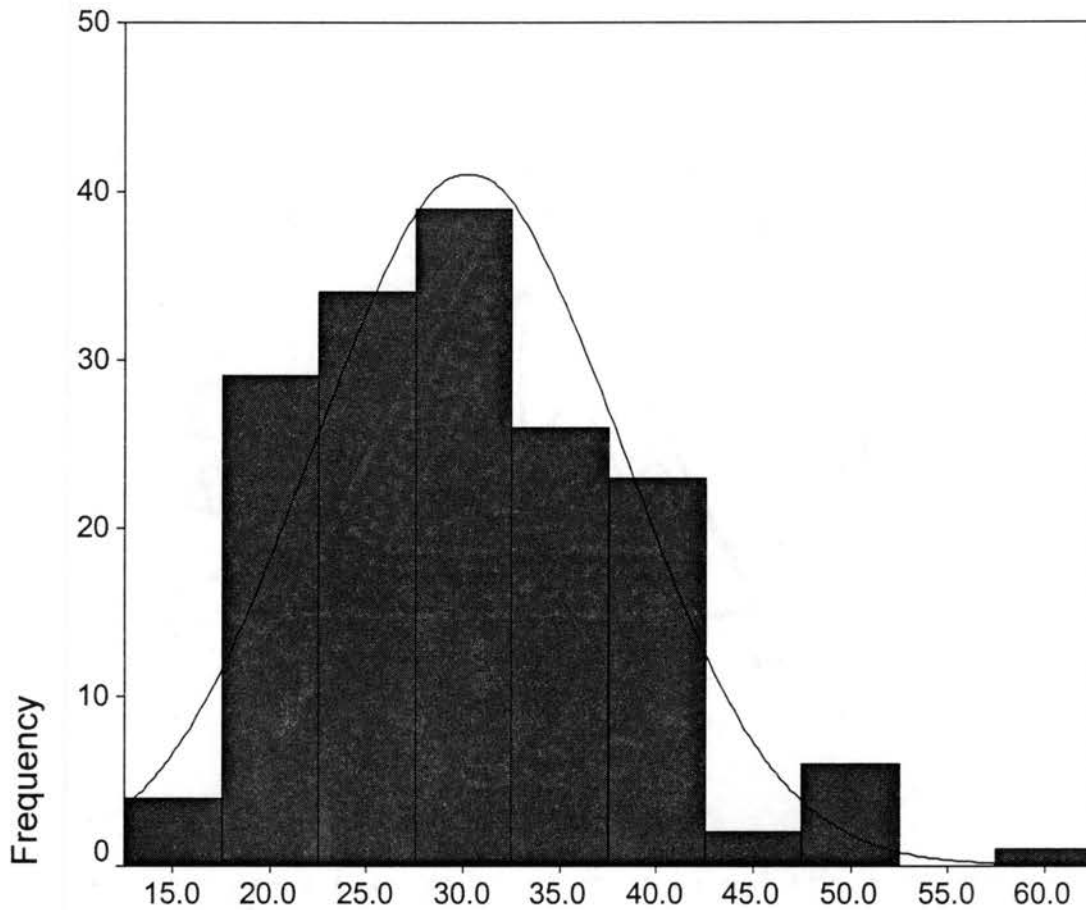
Reactions to Stressors

The Reactions to Stressors as grouped by the SSI are Physical, Emotional, Behavioral, or Cognitive. The term physical refers to anything pertaining to the body (O'Toole, 1997, p. 1247). The Physical scale of the SSI consists of 14 items with a possible range of 14-70. These fourteen questions inquire about issues such as headaches, stuttering, weight fluctuations, and general aches and pains in reaction to stress. The range of responses was 1-59. The mean was 30.01 with a standard deviation of 8.26 (see Figure 7). The frequency distribution for the Physical scale was generally a normal distribution except for frequency 22 which created an outlying cluster (see Figure 7). The average respondent's answer was 2.14, which indicates that students Seldom to Occasionally react physically to stress.

Emotion is an alteration of feeling (O'Toole, 1997, p. 522). The emotional scale consists of 4 items with a possible range of 4-20. These four questions focus on students' reactions to stress with fear, guilt, and anger. The range of responses was 1-20. The mean was 11.01 with a standard deviation of 3.45 (see Figure 8). The frequency distribution for Emotion was also generally normal with a

basic bell-shape, again showing a cluster just to the left of the mean. The average respondent's answer was .75,

Figure 7: Distribution for SSI Physical Scale

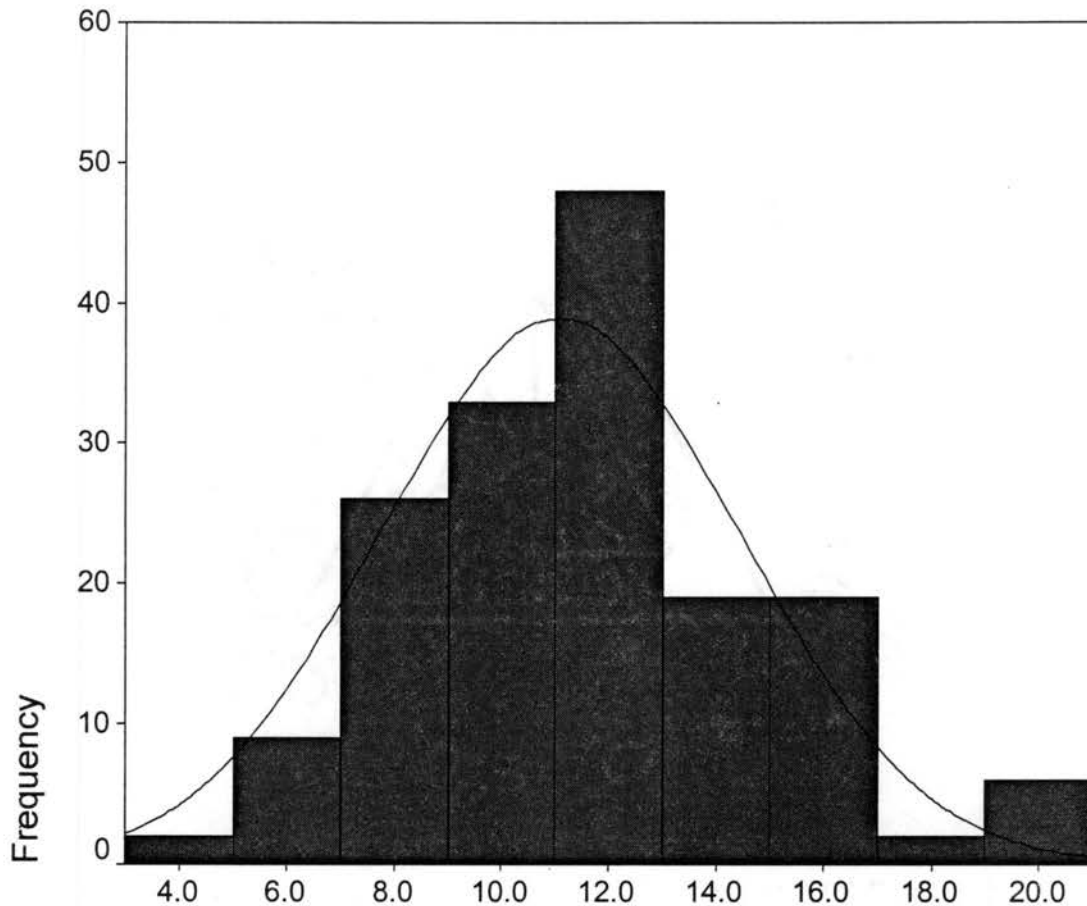


which indicates that Seldom to Occasionally students struggle with Emotional reactions to stress.

Behavior is the observable responses of someone (O'Toole, 1997, p. 185). The Behavioral scale consists of 8 items with a possible range of 8-40. These eight questions inquire about student tendencies of reacting to stress by crying, attempting suicide, smoking, or using

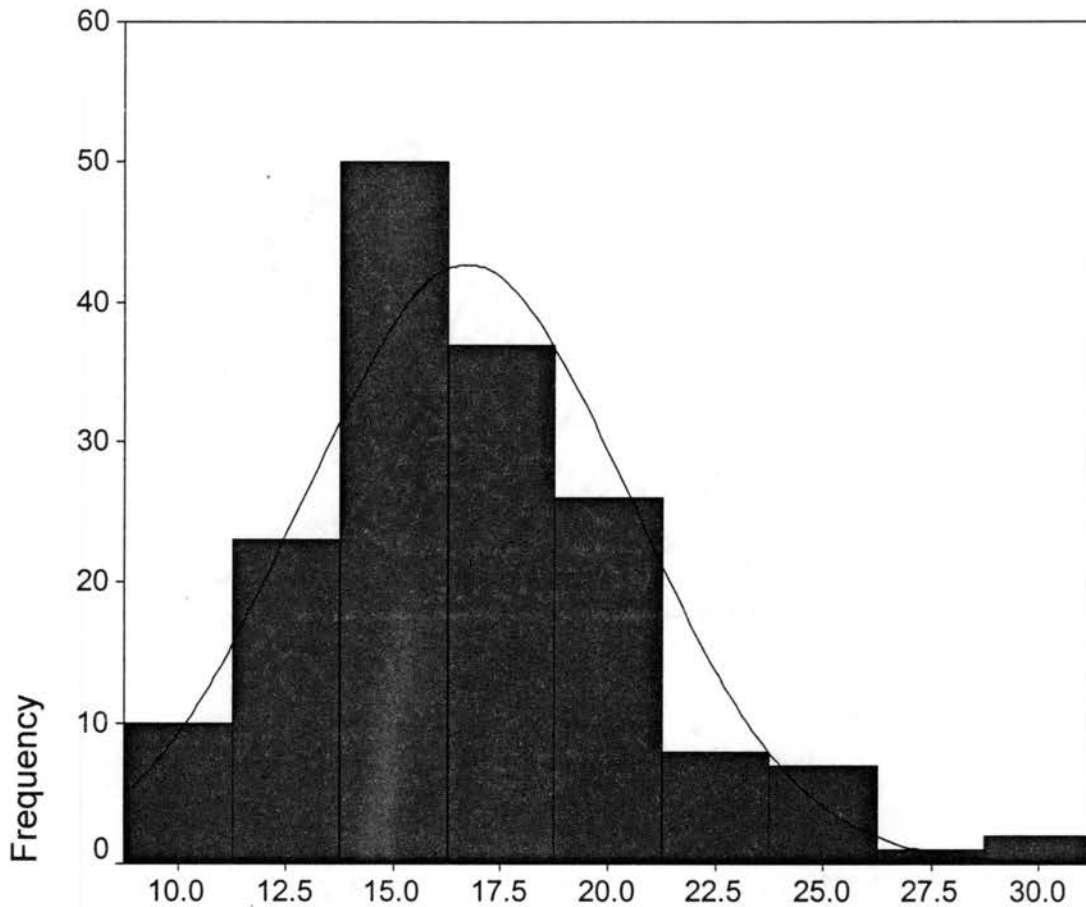
drugs. The range of responses for Behavior was 1-31. The mean was 16.6 with a standard deviation of 4.02

Figure 8: Distribution for SSI Emotional Scale



(see Figure 9). The frequency distribution for Behavioral looks similar to many of the charts with a generally normal distribution. The average respondent's answer was 2.07, which indicates that students' Behavioral reactions to stress occur Seldom to Occasionally. Cognition is the ability to critically think about a situation, or it is simply knowing, perceiving, and remembering (O'Toole, 1997, p. 349). The Cognitive scale consists of 2 items with a

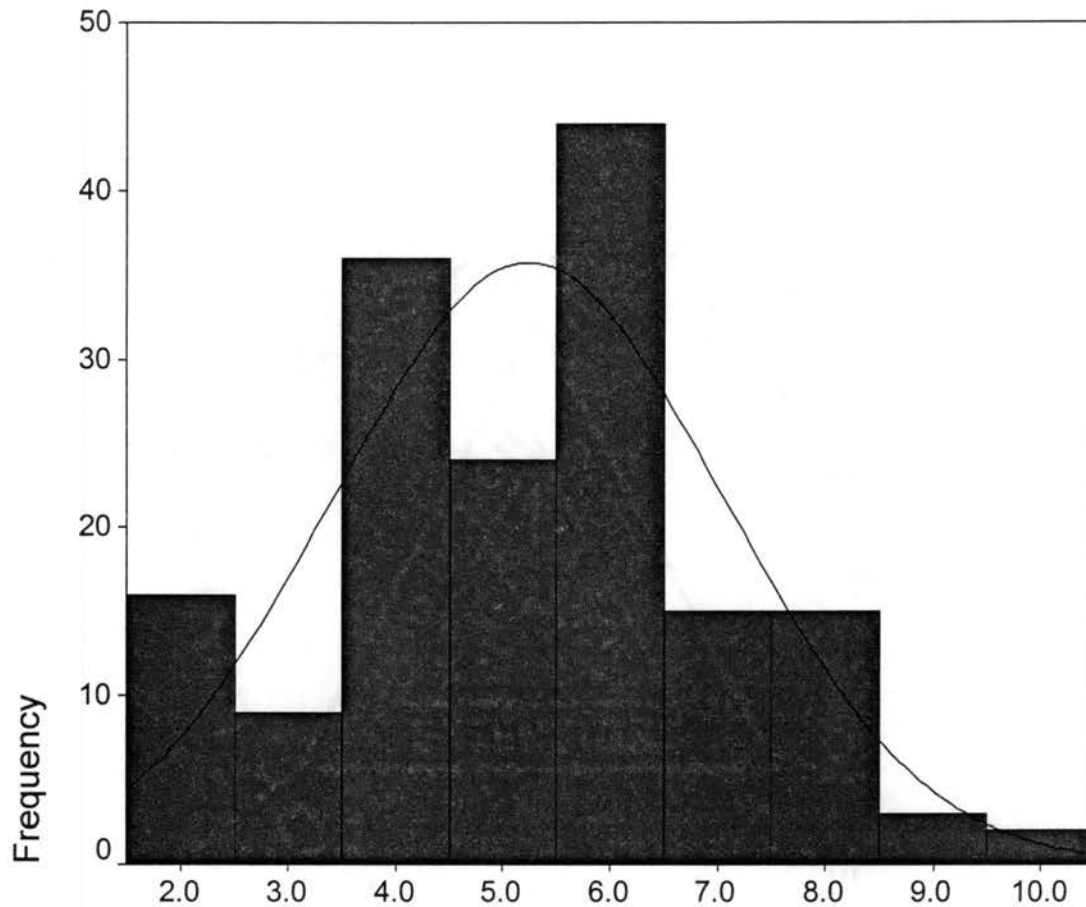
possible range of 2-10. These two questions focus on whether students have analyzed their stress. The range of Figure 9: Distribution for SSI Behavioral Scale



responses for the Cognitive scale was 1-10. The mean was 5.2 and has a standard deviation of 1.86 (see Figure 10).

The frequency distribution for Cognition also follows a typical bell-shaped curve and shows a generally normal distribution. The average respondent's answer for Cognition was 2.6, which indicates that students Seldom to Occasionally have Cognitive reactions to stress (see Figure 10).

Figure 10: Distribution for SSI Cognitive Scale



Summary of Scale Distributions

A frequency distribution is the amount of variation among members of the sample population (Gay, 1987, p. 379). The nine scales for this study all showed a generally normal distribution and highlight the median responses. When the distribution is somewhat symmetrical there are similar amounts of respondents with high scores as to the number of respondents with low scores. This result notes there are OU-Tulsa students who score high and low on the

stress inventory. The majority of the distributions reveal that OU-Tulsa students are slightly to the left of the mean showing lower stress scores.

Relationship of Stress to Other Variables

Several analyses were conducted in order to examine the relationship of stress to other variables. One set of analyses for the nine stress scales investigated the relationship between the SSI scales and either the academic variables or the demographic variables. The statistical procedure analysis of variance (ANOVA) was used for these analyses. Other ANOVA procedures were completed to determine if a relationship existed between the SSI scores and the perceptions of stress when their self-assessed stress levels grouped the students. The relationship between the SSI scores and learning strategy preference was also investigated.

One-way analysis of variance (ANOVA) is a statistical test "used to determine whether there is a significant difference between two or more means at a selected probability level" (Gay, 2003, p. 467). Generally, ANOVA reveals the variance of scores that have been separated into distinct groups. This is done to identify whether the differences between the groups is more than what is expected by chance (Gay, 2003).

Demographic Variables

Several one-way analyses were conducted to investigate the relationship of stress to various demographic variables. Separate analyses were conducted for each of the nine SSI categories of: Frustrations, Conflicts, Pressures, Changes, Self-imposed, Physical, Emotional, Behavioral, and Cognitive. In addition, composite scores were constructed for the scales that made up the Stressors and for these that made up the Reactions to Stressors. Finally, the Total scale was included. Three demographic variables were analyzed: age, race, and marital status. Overall, no significant differences were found among the SSI scales and the demographic variables of age (see Table 4), race (see Table 5), and marital status (see Table 6).

For age, the participants were divided into four quartiles with a range of 21 years of age to 55 years of age (see Table 4). The variable of age was grouped by ages: 21 to 23, 24 to 25, 26 to 29, and 30 to 55. This grouping provided four relatively equal groups. The quartiles ranged between 22.7% and 26.4% of the sample for this study.

For race, the participants were divided into two categories of white and non-white (see Table 5). Since many of the non-white groups were small, they were grouped

into one category. The distribution for the sample was 80% white and 20% non-white.

Table 4: ANOVA for SSI Scores and Age

Scale	SS	df	MS	F	P
Physical					
Between	318.45	3	106.15	1.57	0.199
Within	10893.53	161	67.66		
Self-imposed					
Between	43.33	3	14.44	1.24	0.299
Within	1882.07	161	11.69		
Changes					
Between	17.99	3	6.00	0.91	0.436
Within	1057.63	161	6.57		
Reactions					
Between	385.10	3	128.37	0.69	0.562
Within	30135.48	161	187.18		
Conflict					
Between	6.68	3	2.23	0.65	0.586
Within	553.77	161	3.44		
Total					
Between	845.88	3	281.96	0.63	0.598
Within	72291.72	161	449.02		
Cognitive					
Between	6.28	3	2.09	0.60	0.618
Within	564.72	161	3.51		
Stressors					
Between	164.78	3	54.93	0.53	0.660
Within	16555.00	161	102.83		
Frustration					
Between	18.89	3	6.30	0.45	0.717
Within	2250.75	161	13.98		
Emotion					
Between	11.78	3	3.93	0.33	0.807
Within	1944.19	161	12.08		
Pressure					
Between	2.51	3	0.84	0.11	0.957
Within	1278.30	161	7.94		
Behavioral					
Between	5.17	3	1.72	0.10	0.957
Within	2656.22	161	16.50		

Table 5: ANOVA for SSI Scores and Race

Scale	SS	df	MS	F	p
Stressor					
Between	250.00	1	250.00	2.47	0.118
Within	16423.75	162	101.38		
Frustration					
Between	32.38	1	32.38	2.35	0.128
Within	2236.06	162	13.80		
Self-imposed					
Between	26.59	1	26.59	2.29	0.132
Within	1883.19	162	11.62		
Conflict					
Between	5.82	1	5.82	1.72	0.192
Within	548.69	162	3.39		
Total					
Between	676.00	1	676.00	1.52	0.220
Within	72247.14	162	445.97		
Emotional					
Between	9.73	1	9.73	0.82	0.368
Within	1930.05	162	11.91		
Physical					
Between	42.41	1	42.41	0.62	0.433
Within	11104.98	162	68.55		
Reaction					
Between	103.81	1	103.81	0.55	0.458
Within	30354.99	162	187.38		
Changes					
Between	1.93	1	1.93	0.29	0.590
Within	1069.46	162	6.60		
Cognitive					
Between	0.70	1	0.70	0.20	0.656
Within	567.06	162	3.50		
Pressure					
Between	1.35	1	1.35	0.17	0.679
Within	1274.96	162	7.87		
Behavioral					
Between	1.94	1	1.94	0.12	0.731
Within	2653.69	162	16.38		

Table 6: ANOVA for SSI Scores and Marital Status

Scale	SS	df	MS	F	p
Conflict					
Between	10.38	1	10.38	3.27	0.072
Within	507.90	160	3.17		
Cognitive					
Between	5.56	1	5.56	1.65	0.201
Within	540.12	160	3.38		
Self-imposed					
Between	12.50	1	12.50	1.10	0.297
Within	1824.00	160	11.40		
Changes					
Between	6.72	1	6.72	1.03	0.313
Within	1048.12	160	6.55		
Pressure					
Between	7.56	1	7.56	0.98	0.323
Within	1229.65	160	7.69		
Emotional					
Between	6.32	1	6.32	0.54	0.463
Within	1871.46	160	11.70		
Reaction					
Between	30.25	1	30.25	0.16	0.688
Within	29842.54	160	186.52		
Frustration					
Between	2.23	1	2.23	0.16	0.688
Within	2197.58	160	13.73		
Stressor					
Between	12.50	1	12.50	0.12	0.725
Within	16095.78	160	100.60		
Behavioral					
Between	0.50	1	0.50	0.03	0.861
Within	2609.83	160	16.31		
Total					
Between	3.86	1	3.86	0.01	0.926
Within	70953.51	160	443.46		
Physical					
Between	0.01	1	0.01	0.00	0.992
Within	10952.94	160	68.46		

For marital status, the participants were divided into single and not single (see Table 6). There was an exact

distribution in this study with half of the sample married and half single.

Academic Variables

Four academic variables were analyzed: hours spent studying per week; hours spent working per week, academic program, and academic year in program. Overall, there were no significant differences found between the SSI Scores and the academic variables of hours spent studying per week (see Table 7), hours spent working per week (see Table 8), academic program (see Table 9), and year in program (see Table 10).

For hours spent studying per week, the participants' responses were divided into five groups: (a) None, (b) 1 to 10 hours, (c) 11 to 15 hours, (d) 16 to 20 hours, and (e) 21 to 60 hours. This division placed approximately one-fifth of the participants in each group and is compatible with real world study patterns.

For work hours per week, the participants' responses were divided into five groups: (a) None, (b) 1 to 10 hours, (c) 11 to 25 hours, (d) 26 to 40 hours, and (e) 41 to 80 hours. This division was compatible with real world work patterns.

Table 7: ANOVA for SSI Scales and Hours Spent Studying

Scale	SS	df	MS	F	P
Frustration					
Between	102.51	4	25.63	1.89	0.114
Within	2167.12	160	13.54		
Total					
Between	2706.21	4	676.55	1.54	0.194
Within	70431.39	160	440.20		
Stressors					
Between	608.45	4	152.11	1.51	0.202
Within	16111.33	160	100.70		
Cognitive					
Between	20.24	4	5.06	1.47	0.214
Within	550.75	160	3.44		
Physical					
Between	395.91	4	98.98	1.46	0.216
Within	10816.06	160	67.60		
Conflict					
Between	16.10	4	4.03	1.18	0.320
Within	544.35	160	3.40		
Reaction					
Between	851.68	4	212.92	1.15	0.336
Within	29668.91	160	185.43		
Behavioral					
Between	70.35	4	17.59	1.09	0.365
Within	2591.04	160	16.19		
Emotional					
Between	51.39	4	12.85	1.08	0.369
Within	1904.59	160	11.90		
Changes					
Between	18.58	4	4.65	0.70	0.591
Within	1057.03	160	6.61		
Pressure					
Between	16.80	4	4.20	0.53	0.713
Within	1264.01	160	7.90		
Self-imposed					
Between	24.41	4	6.10	0.51	0.726
Within	1900.99	160	11.88		

Table 8: ANOVA for SSI Scores and Hours Worked

Scale	SS	df	MS	F	P
Emotional					
Between	84.00	4	21.00	1.79	0.132
Within	1871.97	160	11.70		
Cognitive					
Between	21.57	4	5.39	1.57	0.185
Within	549.42	160	3.43		
Behavioral					
Between	71.26	4	17.81	1.10	0.358
Within	2590.14	160	16.19		
Conflict					
Between	14.84	4	3.71	1.09	0.364
Within	545.61	160	3.41		
Pressure					
Between	32.34	4	8.09	1.04	0.390
Within	1248.47	160	7.80		
Changes					
Between	23.28	4	5.82	0.89	0.474
Within	1052.33	160	6.58		
Stressors					
Between	321.00	4	80.25	0.78	0.538
Within	16398.79	160	102.49		
Self-imposed					
Between	33.82	4	8.46	0.72	0.583
Within	1891.57	160	11.82		
Frustration					
Between	36.68	4	9.17	0.66	0.623
Within	2232.95	160	13.96		
Total					
Between	731.84	4	182.96	0.40	0.805
Within	72405.76	160	452.54		
Physical					
Between	66.39	4	16.60	0.24	0.916
Within	11145.59	160	69.66		
Reactions					
Between	117.76	4	29.44	0.15	0.961
Within	30402.82	160	190.02		

Table 9: ANOVA for SSI Scores and Academic Program

Scale	SS	df	MS	F	p
Changes					
Between	52.83	4	13.21	2.06	0.088
Within	1018.56	159	6.41		
Physical					
Between	460.68	4	115.17	1.71	0.151
Within	10735.11	159	67.52		
Self-imposed					
Between	76.15	4	19.04	1.64	0.167
Within	1845.46	159	11.61		
Reactions					
Between	898.13	4	224.53	1.21	0.310
Within	29588.18	159	186.09		
Total					
Between	2126.59	4	531.65	1.20	0.315
Within	70733.77	159	444.87		
Behavioral					
Between	73.44	4	18.36	1.13	0.343
Within	2574.87	159	16.19		
Pressure					
Between	34.05	4	8.51	1.09	0.364
Within	1242.26	159	7.81		
Stressors					
Between	398.32	4	99.58	0.98	0.422
Within	16204.90	159	101.92		
Frustration					
Between	50.08	4	12.52	0.90	0.466
Within	2215.16	159	13.93		
Emotional					
Between	37.07	4	9.27	0.77	0.546
Within	1914.83	159	12.04		
Cognitive					
Between	3.67	4	0.92	0.26	0.901
Within	552.84	159	3.48		
Conflict					
Between	2.84	4	0.71	0.20	0.935
Within	550.96	159	3.47		

Table 10: ANOVA for SSI Scores and Year in Program

Scale	SS	df	MS	F	p
Behavioral					
Between	62.63	1	62.63	3.92	0.049
Within	2442.25	153	15.96		
Reactions					
Between	299.53	1	299.53	1.57	0.212
Within	29201.42	153	190.86		
Total					
Between	684.18	1	684.18	1.50	0.222
Within	69664.50	153	455.32		
Changes					
Between	7.47	1	7.47	1.10	0.296
Within	1039.60	153	6.79		
Physical					
Between	62.50	1	62.50	0.89	0.347
Within	10765.09	153	70.36		
Stressors					
Between	78.32	1	78.32	0.76	0.386
Within	15866.77	153	103.70		
Self-imposed					
Between	6.69	1	6.69	0.57	0.452
Within	1801.21	153	11.77		
Pressure					
Between	3.29	1	3.29	0.42	0.519
Within	1201.06	153	7.85		
Frustration					
Between	2.95	1	2.95	0.21	0.651
Within	2193.53	153	14.34		
Emotional					
Between	1.36	1	1.36	0.11	0.739
Within	1862.64	153	12.17		
Cognitive					
Between	0.10	1	0.10	0.03	0.863
Within	526.19	153	3.44		
Conflict					
Between	0.00	1	0.00	0.00	1.000
Within	546.17	153	3.57		

For Academic Program, the participants' responses were divided into five groups. These groups are the five health

science colleges offering degrees on The University of Oklahoma-Tulsa campus. The five groups were: Medicine, Nursing, Occupational Therapy, Pharmacy, and Physical Therapy.

The first two years of study are mostly classroom experiences. However, the final two years are predominantly clinical experiences. To investigate if stress differences existed during these stages of study, the students were grouped as either: in years 1 and 2 or in years 3 and 4. There was a significant difference on the Behavior scale when students were grouped by these stages of their program (see Table 10).

For Students in the grouping of each year of program for three years, the participants' responses were divided into three groups of academic years: year one, year two, and year three. All three years were analyzed to see if there were significant differences of SSI scores and the year of training. There were no significant differences between the SSI Scores and the three academic year program grouping (see Table 11).

Table 11: ANOVA for SSI Scores and Each Year of Program for Three Years

Scale	SS	df	MS	F	p
Behavioral					
Between	73.97	2	36.98	2.31	0.102
Within	2430.91	152	15.99		
Reaction					
Between	375.36	2	187.68	0.98	0.378
Within	29125.58	152	191.62		
Self-imposed					
Between	20.86	2	10.43	0.89	0.414
Within	1787.04	152	11.76		
Total					
Between	732.20	2	366.10	0.80	0.452
Within	69616.48	152	458.00		
Changes					
Between	7.84	2	3.92	0.57	0.565
Within	1039.23	152	6.84		
Physical					
Between	74.99	2	37.50	0.53	0.590
Within	10752.60	152	70.74		
Emotional					
Between	12.92	2	6.46	0.53	0.590
Within	1851.08	152	12.18		
Frustration					
Between	14.35	2	7.17	0.50	0.608
Within	2182.13	152	14.36		
Stressor					
Between	81.49	2	40.74	0.39	0.677
Within	15863.61	152	104.37		
Cognitive					
Between	2.64	2	1.32	0.38	0.683
Within	523.66	152	3.45		
Conflict					
Between	1.53	2	0.77	0.21	0.808
Within	544.64	152	3.58		
Pressure					
Between	3.39	2	1.70	0.21	0.807
Within	1200.95	152	7.90		

Self-Assessment Variable

Before initiating the question segment of the 51-item Likert instrument, students were asked to rate their overall stress levels. Self-assessment is the segment of the SSI in which students rate their own stress levels, using the designation of mild, moderate, or severe. These ratings were used for the self-assessment analyses.

Unlike the analyses for demographic and academic variables, significant differences were found on 10 of the 12 SSI scales (see Table 12). The two scales that did not show significant differences were Conflict and Behavior. Post hoc analyses were conducted on the other 10 scales to locate the differences in the groups. The Scheffe procedure was used. This procedure determines where the significant difference was within the data. The Scheffe test calculates an F ratio for each mean comparison and is considered to be a conservative test (Gay, 1987, p. 393, p. 409).

All 10 individual, post hoc analyses revealed the pattern of two primary groups: a mild and moderate group and a severe group (see Table 13). The severe group tended to consistently score higher on the SSI scales, the Total scale, and on the Stressor and Reactions to Stressors

scales. Thus, the group that self-assessed itself as having severe stress scored significantly higher on

Table 12: ANOVA for SSI Scores and Self-Assessment on Stress

Scale	SS	df	MS	F	p
Stressors					
Between	3700.19	2	1850.10	23.02	0.001
Within	13019.59	162	80.37		
Changes					
Between	237.02	2	118.51	22.89	0.001
Within	838.59	162	5.18		
Total					
Between	12434.46	2	6217.23	16.59	0.001
Within	60703.14	162	374.71		
Pressure					
Between	191.14	2	95.57	14.21	0.001
Within	1089.68	162	6.73		
Emotional					
Between	241.67	2	120.84	11.42	0.001
Within	1714.30	162	10.58		
Physical					
Between	1296.71	2	648.35	10.59	0.001
Within	9915.27	162	61.21		
Frustration					
Between	236.59	2	118.29	9.43	0.001
Within	2033.05	162	12.55		
Reaction					
Between	2663.77	2	1331.88	7.75	0.001
Within	27856.81	162	171.96		
Self-imposed					
Between	159.74	2	79.87	7.33	0.001
Within	1765.66	162	10.90		
Cognitive					
Between	43.26	2	21.63	6.64	0.002
Within	527.74	162	3.26		
Conflict					
Between	15.56	2	7.78	2.31	0.102
Within	544.89	162	3.36		
Behavioral					
Between	48.90	2	24.45	1.52	0.223
Within	2612.49	162	16.13		

almost all of the scales than those who viewed their stress as either mild or moderate.

For the Learning Strategy Scores by SSI Scores, the ANOVA showed one significant difference on the scale of Conflict. The remaining 11 scales showed no significant differences. Thus, learning strategy preference groups reveal no systematic differences on the Student-life Stress Inventory (see Table 14).

Summary of one-way ANOVA Techniques

Several one-way ANOVAs were conducted to investigate the relationship between stress, as measured by the Student-life Stress Inventory (SSI) scores and the academic and demographic variables. Of the 96 individual analyses conducted, only one significant difference was found. Thus, there were no overall differences in stress related to the demographic and academic variables in this study.

However, the situation for self-assessment was very different. Here 10 of the 12 scales showed significant differences. The post hoc analyses revealed two distinct groups. The group with the higher stress scores viewed themselves as severely stressed. Those with the lower stress scores viewed themselves as with mildly or moderately stressed. These findings support the notion that when students believe they are stressed, this perception is

reality. Students who believe they are stressed are indeed stressed.

Table 13: Means for Scales with Significant Differences in Self-Assessment

Variable	Mild	Moderate	Severe
Stressors	64.5	67.6	80.5
Changes	7.1	7.7	11.1
Pressure	12.8	13.9	16.6
Emotional	9.8	10.8	13.9
Physical	25.9	29.9	36
Frustration	16.2	16.8	20.1
Reaction	57.4	62.5	71.8
Self-imposed	20.2	20.7	23.4
Total	121.9	130.2	152.2
Cognitive	5.8	5.3	4

Learning Strategies

Focus groups were completed with Allied Health students who were studying physical and occupational therapy to collect data related to stress and learning strategy preferences. Three focus group sessions were conducted with each of the learning strategy preference groups of Navigators, Problem Solvers, and Engagers for a total of nine focus group sessions. There were 48 Allied Health students who participated in focus group sessions in a 4-week period. The focus groups were conducted on the campus of OU-Tulsa in a medium-size conference room and had

approximately 6-8 participants in each session. The students' words were powerful when they described and discussed stress in the focus group sessions. Some of the descriptive words expressed were as follows: extremely frustrated, afraid, fear, forced, sadness, difficult, unfamiliar, disrupted, unstable, pressure, confusing, pain, and worried.

Navigators

Navigators typically are focused students tending to be results-oriented, planners, organizers, and high achievers who appreciate logical connections (Conti & Kolody, 1999, p. 9). Several common responses emerged from the Navigator focus groups. Navigators stated they accomplish learning tasks and projects best when they begin the project early, thereby not procrastinating. Also, they prefer to write out goals and make lists of necessary tasks to keep organized. The idea of crossing off items on the list was also satisfying to one student in the study.

Navigators in this study commented that it was helpful to set specific times dedicated to either study or to complete assignments. They often set their own deadlines for completion. A Navigator in this study commented, "To stay on top of things, I bought a schedule type of calendar, plus I try to not overdo it" (Female, 2nd year, Occupational

Therapy student). Planning and structure are extremely important to Navigators (Conti & Kolody, 1999, p. 9).

Table 14: ANOVA for SSI Scores and Learning Strategies

Scale	SS	df	MS	F	p
Conflict					
Between	28.67	2	14.33	4.30	0.015
Within	526.90	158	3.33		
Pressure					
Between	28.75	2	14.38	1.88	0.156
Within	1208.03	158	7.65		
Behavioral					
Between	45.30	2	22.65	1.55	0.215
Within	2305.56	158	14.59		
Stressors					
Between	299.71	2	149.85	1.52	0.221
Within	15551.11	158	98.42		
Emotional					
Between	26.06	2	13.03	1.17	0.313
Within	1758.19	158	11.13		
Total					
Between	903.21	2	451.61	1.12	0.330
Within	63836.34	158	404.03		
Changes					
Between	13.29	2	6.65	1.04	0.354
Within	1005.70	158	6.37		
Analyze					
Between	6.56	2	3.28	0.99	0.376
Within	526.00	158	3.33		
Frustration					
Between	18.64	2	9.32	0.74	0.479
Within	1990.06	158	12.60		
Reaction					
Between	185.25	2	92.62	0.59	0.556
Within	24802.74	158	156.98		
Physical					
Between	34.19	2	17.09	0.29	0.749
Within	9310.92	158	58.93		
Self-imposed					
Between	3.87	2	1.94	0.16	0.852
Within	1910.82	158	12.09		

Stressful situations that Navigators have experienced in the past year fall into three groups. The three categories of stress issues for Navigators were personal stress, academic stress, and environmental stress. Personal stress totaled about 56% of the stress issues discussed in the focus groups. Students described their personal stress with examples like: planning a wedding, building our first home, and spouse's miscarriage. Other personal stress issues for Navigators were in regard to family members; these included listing parents' divorce and loved ones medical conditions as stress causing events. Navigators discussed personal issues of stress through comments like "I just didn't know what to do," and "I felt out of control". A second year Occupational Therapy student commented, "I was extremely frustrated because I didn't know what was going on with her" [a close family member]. The loss of control with daily life seemed to be a continuing theme of stressors for Navigators.

Academic stressors were discussed through issues such as: confusions from assignment information, presenting for a class project, and unclear assignment deadlines. Over 36% of Navigators stress was labeled academic-related. Studying for finals and writing papers were other stressful situations Navigators in this study experienced. One first

year Physical Therapy student stated, "If only I knew what my instructor expected of me, my stress would be less." The environment was found to have caused about 8% of the stress scenarios generated by Navigators. Completing a clinical rotation in an unfamiliar setting, plus the burden of commuting to clinical rotations were also listed as stressful. Consensus was reached in one focus group as students discussed the extra stress of a changing environment each time they were assigned to a new clinical site.

Navigators in this study attempted to manage and cope with stress by scheduling time off, actually writing in a planner or date book, setting aside time to have fun. Many students commented that they live by organizers and planners. While other students commented that they schedule regular tanning sessions and manicures to relieve stress.

Problem Solvers

Problem Solvers are critical thinkers who often test assumptions and generate alternatives. Students who are Problem Solvers are open to alternatives and tend to be curious and inventive. Likewise, Problem Solvers often "procrastinate because it allows thinking to continue" (Conti & Kolody, 1999, p. 12).

From the Problem Solver focus group, a question regarding specific actions taken to complete learning projects was asked. The Problem Solvers in this study commented repeatedly on the big picture stating they wanted to check my [their own] understanding and get the overall idea of the project, often using timetables. Once the big picture was lucid, Problem Solvers stated that they needed to break it down and split it into sections to complete a learning task. Common remarks from Problem Solvers included that they preferred to stay away from distractions and stay at school to complete learning tasks.

When asking Problem Solvers about their stress, the responses were extremely individualized and related to a wide range of topics from concerns about the future to a school case report. Analysis of the Problem Solvers answers showed that there were no clear patterns of stress except that the determinations that Problem Solvers answers were individualized. Problem Solvers also commented that when under stress it is important for them to "remain calm and address the problem". A Physical Therapy student revealed that he avoided stress by "keeping my nose in the books." Problem Solvers are those who prefer practical experience and who thrive in environments that allow reflection (Conti & Kolody, 1999, p. 13).

Engagers

Engagers learn best if they are actively engaged in something that interests them or in which meaning can be associated (Conti & Kolody, 1999, p. 13). Moreover, Engagers rely on others in their learning process; "because the central feature of learning for Engagers is building relationships, they rely heavily on human resources" (Conti & Kolody, 1999).

In the Engager focus group sessions in this study, Engagers frequently reported that they prefer to involve others in their learning process. The Engagers revealed that they often ask for help, talk with other students about the project, consult with classmates, and share ideas and brainstorm with others when completing an assignment. Engagers also indicated that they needed to "go over the list in their heads" and "make mental notes" as they learn.

After inquiring about the types of stress that Engagers experience, the response was overwhelmingly clear that the focus group itself was a positive environment for Engagers. The discussions during the Engager focus groups were more lively and active than the other groups. Many comments were seconded by others and were often coupled with other student responses.

The Engagers responses about stress were completely focused on relationships. Their issues with stress centered mostly on boyfriends, grandparents, parents, marriages, and roommates. The underlying theme for Engager is that stress is personal. Engagers in this study sought ways to vocalize how stress directly affects them. Being verbal with stress and stress-related issues is important to Engagers. To do this they call their friends, get advice from people, and even help others in order to relieve their own stress.

Summary of Learning Strategies

Qualitative research was conducted with Allied Health students in the fields of physical and occupational therapy. Nine focus groups were conducted with 48 participants. The 3 learning strategy preference groups produced distinctly different data when discussing stress. Students were asked to critically reflect upon a previous stressful experience while completing a program at OU-Tulsa. The responses dramatically matched the general characteristics of the learning strategy preference groups of Navigator, Problem Solver, and Engager.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Summary of the Study

Stress is not a new concept. Stress can affect people both physically and psychologically (Lazarus, 1969; Selye, 1978). Stress can also affect learning abilities (Misra & McKean, 2000; Mosley et al., 1994; O'Meara et al., 1994). Training students to become health care professionals is often viewed as a stress-provoking process (Mosley et al., 1994; Tows, 1997).

Health care training is incredibly important due to the nature of healing and saving lives. Sharing the responsibilities of diagnosing, treating, or caring for another's health can be a stressful process. Adding to those pressures is the stress of the training experience itself. Students are introduced to massive amounts of educational material with expectations of mastery. Understanding how students learn and how they react to stress are two important steps to helping them become successful health care professionals.

Therefore, the purpose of this study was to describe the learners in the health care professions at The University of Oklahoma-Tulsa (OU-Tulsa), where stress was

believed to affect learners. This study specifically sought to understand students' learning strategy preferences and stress indexes. This was accomplished by (a) identifying the learning strategy preferences of adult learners at OU-Tulsa majoring in the health care professions; (b) identifying the student stress levels of those learners; (c) examining the relationship of these preferences and stress levels to academic variables, demographic variables, and a self-assessment variable; and (d) conducting focus groups to describe the stress for each learning strategy preference group.

For this descriptive study, 165 students at OU-Tulsa volunteered their participation. Student data were collected from four colleges on the campus of OU-Tulsa: Allied Health, Medicine, Nursing, and Public Health. Two instruments were used to collect the quantitative data; one identified learning strategy preferences and another identified student stress levels. The Assessing the Learning Strategies of Adults (ATLAS) identified learning strategies and placed individuals in the categories of Navigator, Problem Solver, or Engager. The Student-life Stress Inventory (SSI) measured the individual stress level for each student and reported it in several scales. In

addition, students self-assessed their stress levels as mild, moderate, or severe.

To collect qualitative data, focus group sessions were conducted. Focus group participants were invited to further discuss stress and learning issues in greater detail. Nine focus group sessions were conducted with three sessions for each of the ATLAS categories. There were 48 students who participated in focus group sessions.

Summary of Findings

Several statistical procedures were used to investigate students' stress levels and their learning strategies along with demographic and academic variables. These procedures included frequency distributions, chi-square, and analysis of variance. Focus groups were conducted to collect qualitative data.

Chi-square was used to determine the relationship between the learning strategy scores of OU-Tulsa students and the norms for ATLAS. The findings indicate a significant difference between what was observed for OU-Tulsa students and what was expected based on the norms for ATLAS. The University of Oklahoma-Tulsa's health science programs in Allied Health, Medicine, Nursing, and Public Health attract a disproportionate number of Navigators and Problem Solvers with Navigators outnumbering Problem

Solvers. The observed number of Engagers was close to the expected frequency.

Frequency distributions were computed for each of the nine scales of stressors and reactions to stressor on the SSI, and for the total stress scale. These frequency distributions consistently resemble a generally, normal bell-shaped distribution. These distributions reveal that there is a wide variation in the stress levels of the medical students and that the stress is not as intense as generally thought. For scale after scale, the distributions generally showed larger clusters of responses at the mean. The distributions further revealed that some students scored very low when dealing with stress, indicating that they are rarely influenced by stress. Moreover, the distributions revealed that some students are clearly affected by high levels of stress.

Analysis of variance (ANOVA) statistical techniques were also conducted in this study. The ANOVA was conducted to determine if the Student-life Stress Inventory (SSI) scales differed among various demographic and academic variables. Of the 96 analyses conducted, only one significant difference was found.

Nine focus groups were conducted on the campus of OU-Tulsa. Each learning strategy preference group of

Navigators, Problem Solvers, and Engagers was carried out three times. There were 48 students who volunteered for the 90-minute sessions. The smallest focus group had 4 students participating and the largest group involved 8 students.

The problem for this study was conceptualized around the three areas: stress, adult learning, and health care education. Conclusions and recommendations were drawn from each of the three concept areas and have foundations in this study's literature review. To link stress and adult learning together can provide greater understanding and insight for personnel in various academic settings as well as health care professional students.

Stress

As a result of the findings in this study, the following conclusions can be drawn about stress and the students at OU-Tulsa. The link of stress and adult learning is tenable in the following five conclusions:

1. Stress is individually defined.
2. The stress level for health care students cannot be predicted.
3. The perception of intense stress for all health care students is not accurate.
4. Learning strategy preferences influence perceptions of stress.
5. Learning strategy groups define stress differently.

Of the five conclusions about stress, the first conclusion relates to the individual. Perceptions of stress are key to understanding how stress affects students. The students' frame of reference is in how they perceive stress and stressful situations. Thus, stress is individually defined.

The focus groups revealed that students' perceptions are their reality. If stress is perceived, it matters not whether stress is indeed present (Lazarus, 1969). Kidd wrote in his landmark book How Adults Learn (1959) that "the learner reacts to all experience as he perceives it" (p. 49). This signifies that stress can impact people in various ways. Also this is shown in the ANOVA for Total Score (see Table 13) where a mild/moderate group and a severe group split. Further revealing that some students are motivated by stress, and others are immobilized by it.

Stress was equally distributed among this study's population. There were no significant differences among the variables in this study. The students who self-assessed their stress levels as severe had higher stress scores than those who assessed their stress levels as either mild or moderate.

This study explained that stress is not particular. The focus groups revealed that stress often could come from

more simplistic issues found in everyday life experiences. A multitude of issues can bring about stress to the students at OU-Tulsa, not only the academic environment. It is not the rigorous, intellectual environment alone affecting students, but also the complexities of everyday life that are causing students stress.

Examples of everyday life issues were discussed in several focus groups. Such things as the lack of finances, the death of a pet, a student's car breaking down, and not being satisfied with health insurance were said to bring on more stress.

Money and the lack of it cause me stress. At 25 years old, I should be more independent with my finances but I'm still relying on my parents. (Female, Navigator, second year physical therapy student)

I moved in with my fiancé which has actually increased my stress level a lot because I don't have as much space and independence as I have been used to. (Female, Engager, second year physical therapy student)

The students spoke about extremely private and personal stress issues with candor. Often the groups discussed various unexpected life circumstances that can affect students. For example, none were as great as losing a family member.

When my father died, everything stable and familiar in my life changed. I experienced sadness with all the change. I wish my dad

could be a part of the grandbabies' lives.
(Female, Problem Solver, second year
occupational therapy student)

My wife severely hemorrhaged during a
miscarriage and almost died on our anniversary.
We lost the baby at 3 months along but my wife
was okay. (Male, Navigator, third year physical
therapy student)

Relationships and the importance of relationships in
students' lives was a major theme for the Engagers in this
study. Feelings are at the forefront for Engagers since
"Engagers initiate a learning activity from the affective
domain" (Conti & Kolody, 1998 p. 13). Meaning must be
assigned before an Engager will fully connect.
Furthermore, an Engagers assignment of meaning as they
operate from the affective domain can be found in many
aspects of students' personal lives not just with learning
activities. The following examples highlight the role
relationships play in students' lives:

I have never talked to my parents about the
topic of dating or guys. I was sure they were
totally against how I felt about this person.
They have high expectations for me and my future
husband. I already know there were things about
him they didn't like. (Female, Engager, second year
physical therapy student)

When my parents were going through a rough time
and my dad was going to quit his job, I was really
stressed. My parents were unstable and they were
also very stressed out. (Female, Engager, third year
physical therapy student)

The pressures in the academic curricula were also issues discussed in a few of the focus groups. For instance, some students discussed the issue of lacking confidence in one's own abilities.

I was doing a clinical rotation that was my last choice, and I was very unfamiliar with the setting. I felt like I was not smart enough to remember what I needed to know for the rotation (Female, Engager, third year physical therapy student).

When I was writing the case report for clinical reasoning, I constantly wondered if I would meet the criteria. This [case report] was the majority of the points for the whole course. (Male, Problem Solver, second year physical therapy student).

The second stress related conclusion is regarding predictors of stress: stress levels for health care students could not be predicted by the variables included in this study. Successful predictors of students who experience stress would provide great knowledge for student service personnel. The demographic data of age, race, gender, and marital status were analyzed. Academic data focused on academic program, the year in program, average hours working per week, and average hours spent studying per week were also analyzed. Classifying students academically or demographically did not predict stress in the OU-Tulsa population.

After analysis with multiple techniques of frequency distributions, and of chi-square and ANOVA with the academic and demographic variables, there were no systematic differences among students. Demographic and academic data did not identify groups or patterns of stress among students. Other methods of identifying students who are affected by stress are necessary.

The third stress related conclusion addresses the stereotype of health care education environments and experiences: The perception of intense stress for all health care students is not accurate. An important step in effectively addressing stress is to learn about the individual. Some students at OU-Tulsa were rather unaffected by stress of their health care education process. Therefore, institutions and their personnel would benefit by inquiring about the reality of the student and understand the various influences on the student. A metaphor of a funnel emerges when thinking about the health care education process. Beginning at the high school level, a great number of students often succeed and achieve high marks in the concept areas of math and science. This success can lead high school student to pursue careers in medical-related fields. This is the widest circumference of the funnel.

Then students proceed onto colligate levels continuing their studies in math and science where there are not as many students who excel. However, many students will succeed, and they may begin a health care program as a graduate student. The funnel has gotten smaller and is more condensed as students apply to graduate programs in health care. Students may begin professional training where they will learn a great amount of knowledge in order to care for and heal people. Some students will not complete their health care training. Thus, the funnel is now at the smallest circumference as students complete their professional degree programs, and they begin to practice medicine and related fields.

The negative perceptions of health care training as stressful and overwhelming is prevalent in medical education literature. However, many OU-Tulsa students did not share that perception of health care training. This is not to say that students were unaffected by stress, but it implies that it is not a crippling experience approached as something one must survive. The opposite is true in this instance, for if a student perceives their stress to be severe, it is severe!

It is important to understand the learning strategy preferences of the students at OU-Tulsa. How the students

approach a learning task can produce insightful information to how the perceptions of a stressful health care training process was shattered.

Learning Strategy Preferences

The fourth and fifth stress related conclusions center around learning strategy preferences and stress: Learning strategy preferences influence perceptions of stress, and learning strategy groups define stress differently. The student's preferences were obtained when they completed the ATLAS instrument. The general characteristics of the learning strategy preference groups of Navigators, Problem Solvers, and Engagers were evident in each of the focus group sessions. When discussing stress and learning, the Navigators at OU-Tulsa matched the general characteristics of Navigators as recorded in the ATLAS.

Navigators

Navigators have been underrepresented in many doctoral studies using ATLAS (Ghost Bear, 2001; James, 2000; Massey, 2002). This study revealed the opposite with almost half of the respondents described as Navigators. The Navigators in this study comprised 48% of the total participants.

Navigators are focused, desire a charted course of actions, and accomplish goals efficiently (Conti & Kolody, 1999, p. 9). Navigators also value planning and structure

and do not tolerate those who waste time (p. 10). Since Navigators prefer to exercise control to their learning environment, many OU-Tulsa students viewed the structure and linear curriculum positively.

Navigators in this study discussed goal setting, deadlines, outlines, and early preparation as ways to minimize stress. The resounding agreement in the focus group with Navigators was that they do not procrastinate; they enjoy getting a jump on assignments so they are not "cramming at the last minute". The practice of critical reflection can be found in a Navigator-specific focus group.

I work with people who are seriously ill and cannot take care of themselves. It is hard to complain about having so much to do or my everyday hassles when I have so many blessings in my life. It helps me to reflect on my life and thank God for being able to get up everyday and make my own decisions. (Female, Navigator, third year physical therapy student)

Consistent with these findings, the majority of OU-Tulsa students who participated in this study are similar to the Alice-type learner, which Sternberg (1996) describes in relationship to intelligence testing. Alice-type learners are linear and analytical thinkers with good memory skills, yet they often lack the ability to synthesize or create new ideas (p. 8). However, Alice-type

learners often have difficulty adjusting to changes academically and in life (p. 9). This theory pinpoints a fault in our school system because Alice-type learners were conditioned to memorize and to get good grades. School systems often reward these Alice-type learner abilities over other abilities such as creativity or innovation.

Barbara-type learners have different abilities from Alice-type learners. Barbara-type learners achieved average grades, but they tend to receive poor test scores. Although the reference letters for Barbara-type learners maybe glowing, often the Barbara-type learners do not receive admission into graduate programs. "Barbara's problem is that she probably has not been very heavily reinforced for what she does well" (p. 9).

The Celia-type learner at best is considered average. Celia-type learners have mediocre grades, test scores, and letters of reference, "but most feel that Celia is not intelligent" (Sternberg, 1996, p. 9). Celia-type learners are intelligent mostly because "she can go into an environment, figure out what is needed to move ahead in that environment, and do it" (p. 9).

Problem Solvers

Problem Solvers were underrepresented in this study. Problem Solvers made up only 20% of the total participants

in this study. Unlike the Navigators in this study, Problem Solvers are innovative thinkers who do not respond well to rigidity, yet they enjoy generating alternatives (Conti & Kolody, 1999, p. 13). Problem Solvers prefer to "rely on critical thinking skills" (p. 13) whereas the Navigators desire a more structured path for learning.

Health science and medical training is often viewed as rigorous with a structured curriculum, which is most likely a deterrent to Problem Solvers due to a narrow view of right and wrong decisions. However, the traits of Problem Solvers are extremely beneficial to the field of medicine and health sciences because questioning the manner of treatment in the past or questioning how things have always been done and trying to generate new ideas or ways of treating patients would potentially lend to health care improvements, innovations, and discoveries.

Although there were very few Problem Solvers in this study, the Problem Solvers also fit the general characteristics of the learning strategy preference group. Problem Solvers in this study stated that they avoided stress by "creating a time table in [my] mind of when to get parts of the assignment done" (Female, second year occupational therapy). Also, one student divulged, "I like

to hide myself from distractions like friends and the telephone" (Male, first year physical therapy student).

The Problem Solvers focus group session carried a theme of the big picture; the Problem Solver students discussed things like "checking understanding" and "getting an overall idea for the project". Multiple Problem Solvers commented that they do their best work when they look at the entire assignment then break it into sections.

Sir Arthur Conan Doyle's famous literary character, Sherlock Holmes, is a classic Problem Solver. This is evident in the character's comments such as:

My mind rebels at stagnation. Give me problems, give me work, give me the most abstruse cryptogram, or the most intricate analysis, and I am in my own proper atmosphere. I can dispense then with artificial stimulants. But I abhor the dull routine of existence. I crave for mental exaltation. (Sherlock Holmes to Dr. Watson in *The Sign of Four*, 1994)

Implications for health science students who do not possess Problem Solving traits are alarming due to the nature of medical professions in which uncovering truths and challenging assumptions is paramount. With the high rate of change in protocols and therapies and vast amount of new information routinely dispensed in the current health care setting, problem solving abilities are beneficial.

Engagers

The number of Engagers at OU-Tulsa was quite close to the ATLAS norms. Engagers that participated in this study made up 32% of the total participants. The Engagers also expressed information in the focus group sessions that was similar to the general characteristics of the Engager learning strategy preference.

Engagers in this study are primarily concerned with relationships; this is unlike the Navigators who tended to focus on and discuss more academic-related issues. Engagers explained that the various relationships formed with peers, professors, and their own families were of more importance than academic issues. This sentiment from the Engager focus group sessions was echoed by Kidd who stated, "The key to learning is engagement—a relationship between the learner, the task or subject matter, the environment, and the teacher" (Kidd, 1973, p. 266).

As learners, Engagers are also attracted to an environment that encourages and fosters human interactions. There are elements in the nature of health care professions that support these Engagers' preferences; these involve touching, healing, and working closely with patients.

The overwhelming consistency with the Engagers comments in this study concerned relating to people.

Academically, Engagers looked to "get input from others", and they discussed feeling comfortable asking for help when necessary. Also it was unanimous with the Engager group that "consulting with classmates" was a positive exercise. The theme for the Engagers group was collaboration. They preferred to share ideas and talk about class projects or assignments as a way to relieve stress and to complete learning tasks.

The OU-Tulsa students revealed the same characteristics in the focus groups as the three learning strategy preference groups found in ATLAS. Although statistically, this study found no significant differences between students and stress, the OU-Tulsa students described different ways of perceiving, reacting, and managing their stress.

Management of Stress

The management of stress was discussed in the focus group sessions when the students were asked how they deal with a stressful situation. The responses from the Navigators in this study were similar to those characteristics revealed in ATLAS. For instance, Navigators commented they prefer to manage stress by "planning, keeping my planner to date." Also Navigators discussed "staying on budget, listing priorities, getting

more information from peers and professors, and general discussion as ways to keep stress in check".

The Problem Solvers discussed managing stress in a multitude of ways which were extremely individualized. Problem Solvers stated they "just do it" and do not focus on managing stress. Others preferred to "go through old memories and stay calm" as means to deflect stress.

On the other hand, Engagers stated they were very active when managing their stress. Participants preferred to "talk it out", to help others, and to have "a dialogue in my head" when experiencing stress. A theme for the Engager participants in this study was prayer as a means to manage stress. Again, Engagers rely upon the relationship formed with a higher power to assist them in stressful situations.

To ultimately view these adult learners from a narrow higher education perspective, which focuses on curriculum content, would be overlooking the holistic needs of the adult learners at The University of Oklahoma-Tulsa campus. Eduard Lindeman (1926/1961), a visionary in the field of adult education, understood the higher education perspective when he wrote, "If adult education is to produce a difference of quality in the use of intelligence,

its promoters will do well to devote their major concern to method and not content" (1926, p. 114).

Adult Learning

Another step in understanding students is to recognize that they are adults and that they utilize adult learning principles. As a result of the findings of this study, the following three conclusions can be drawn about adult learning:

1. The students at OU-Tulsa are adult learners who utilize adult learning principles and rely on adult experiences.
2. Students are being influenced not by higher education but by adult education and the complexities of life.
3. OU-Tulsa students use metacognition.

The first adult learning conclusion helps to define the OU-Tulsa student population: The students at OU-Tulsa are adult learners who utilize adult learning principles and rely on adult experiences. A few characteristics of adult learners are that adults need relevance in their learning, they need to apply learning immediately, and they need to feel important (Knowles, 1984). OU-Tulsa students are identifying problems in their personal and professional lives which directly links them to real-life learning. The students are seeking the immediate application of knowledge to help solve their problems. As students seek knowledge, learning-how-to-learn techniques are often explored.

OU-Tulsa students have adapted to the academic environment and continue to adjust and implement learning-how-to-learn principles. Throughout this process, students are becoming more aware of themselves as learners. Smith's learning-how-to-learn principles are connected to this personal awareness of how students learn. Additionally, the adult education principles of learning how to learn and lifelong learning are also crucial to remaining current in today's information age.

As learners in health science professions, students continuously received reinforcement about the need to become lifelong learners. These reminders often come at the introduction of continuing education credits required by professional organizations like The Oklahoma State Medical Association (OSMA) and The American Physical Therapy Association (APTA). Many continuing education requirements are earned yearly and are mandated by professional organizations.

Students also strive to become lifelong learners when they understand the importance of remaining current in an ever-changing health care system. Whether students are required or are self-directed in the process of gaining new knowledge, students can continue to rely on adult education

principles throughout their lives as practitioners and health science professionals.

In the focus group sessions when students were asked to reflect on previous stressful experiences, students used critical reflection. This critical reflection is an avenue that can provide greater understanding to students about the management or mismanagement of stress. Critical thinking is an adult education principle that may allow students to question their ways of thinking and to evaluate new ways to cope with stressful life experiences.

The second conclusion related to adult learning in this study reflects the understanding that many things can influence adult students: Students are being influenced not by higher education, but by adult education and the complexities of life. The complexities of life for OU-Tulsa students can be related to the classic concept found in adult education, Theory of Margin (McClusky, 1963). The Theory of Margin represents the idea that "adulthood is a time of growth, change, and integration in which one constantly seeks balance between the amount of energy needed and the amount available" (Merriam & Cafferella, 1999, p. 280).

Theory of Margin states that a balance in which load of life (L) when divided by Power of life (P) equal the

Margin in life (M) or $(M = L/P)$ (Merriam & Cafferella, 1999, p. 280). The energy that remains is Margin in life. This premise is relevant because "adult students in particular have to be adept at juggling multiple responsibilities and demands on their time" (Merriam & Cafferella, 1999, p. 280). When one's balance is faulty or one's Margin in life is not vast, stress is often the result.

A person's awareness of how he or she learns is called metacognition (Conti & Fellenz, 1991). Using metacognition is how the students who were more stressed at OU-Tulsa recognized they were stressed. Students who realized or knew they were stressed were indeed experiencing stress. Since this study revealed that students know themselves, it is important to remember that asking students about personal stress and stress-related issues can provide valuable information.

The third conclusion related to adult learning regards metacognition: OU-Tulsa students use metacognition. The idea of "thinking about the process of thinking" leads to improvement in the classroom (Conti & Fellenz, 1991) and can also assist students when dealing with stress. A full understanding of one's metacognition as it relates to

learning strategies can improve student performances in the classroom (D. Munday 2003, W. Munday, 2003).

Within the area of metacognition are the steps of planning, monitoring, and adjusting. Therefore when experiencing stress, students can have a plan to manage or cope with the stress, plus they can monitor and adjust their plan in order to better understand themselves. For adult learners the concept of metacognition is "viewed as the highest level of mental activity and is especially needed for complex problem solving" (Merriam & Cafarella, 1999, p. 206).

Discussion and Recommendations

Once students identify themselves as stressed, student service personnel and faculty members need to take note. University personnel can utilize students' self-assessments on stress to better understand, serve, and meet student needs. Metacognition is a key element to better serve and train health care professional students. Helping students to recognize and utilize metacognition can also improve their performances during health care training and beyond.

Knowledge of learning strategies can provide instructors and service personnel with tools to better understand and respect individual learning differences. This, in turn, can serve to better meet learners' needs.

Moreover, an increase in students understanding of their own learning strategy preferences has also shown to improve student performance. (W. Munday, 2003). Various instructional strategies from the adult education literature can provide assistance to building curricula that will support and assist in the teaching of problem-solving skills, such as assisting students in developing metacognition and teaching learning-how-to-learn principles.

Existing OU-Tulsa university student-related-services should be evaluated for effectiveness. This process can lead to an individualized, student-centered environment. For incoming students, the ability to understand learning strategy preferences may provide information on potential stressors for students. This, in turn, can help the university to better meet student needs.

A student-centered environment is one that addresses the retention of students and offers services for the mental health as well as the physical health of students. Program retention and learning strategies have not been studied in this context or ever researched at OU-Tulsa. Further study is recommended to understand individual differences in learning strategies and student retention. The identification of at-risk students and utilizing ways

to improve student involvement with campus activities are also components of a student-centered environment. It is important for health care education programs to remember, "When an institution comes to think more of its own advancement of the community, it is out of harmony with true progress" (Lindeman, 1921, p. 9).

Training health care professionals to strive for academic excellence and to maintain high professional standards is a worthy task and is important to best serve, treat, and heal people. The College of Allied Health as well as other OU-Tulsa health sciences programs could benefit from teaching problem-solving abilities in order to develop advanced medical personnel that are skilled at generating alternatives and challenging assumptions. Data from this study reveals there are few Problem Solvers in the health science programs at OU-Tulsa. Since there are very few who use these problem-solving techniques naturally, training is needed. Referring again, to one of the best known Problem Solver, Sherlock Holmes:

When you have eliminated all which is impossible, then whatever remains, however improbable, must be the truth (Sherlock Holmes in *The Blanched Soldier*, 1994).

Further research with learning strategy preferences as a predictor of career choices could bring about significant

new knowledge for students interested in the health science professions. To understand how students make career choices and to identify the primary reasons students enter health care professions could better help the educational organizations to ultimately connect and then serve students. Furthermore, more research may uncover why some health science programs are not attracting larger numbers of Problem Solvers (Chesbro, 2000).

Research with health science faculty members' teaching styles and ATLAS is also recommended. This research could provide insight to faculty members about teaching styles and the potential of networking the students preferred learning strategy preferences. When a faculty member is aware that a Navigator yearns for prompt feedback, the faculty member can create additional learning tools with feedback for Navigators.

Further research with metacognition and the faculty at OU-Tulsa would also increase both student and faculty understanding of metacognition. Student services research is also recommended to identify avenues to better assist students in areas such as counseling services for times when students experience extreme stress and better financial information and assistance at OU-Tulsa.

Epilogue

OU-Tulsa's motto is teaching, healing, and discovering. For the field of medicine and health sciences, adult learning principles are vital to empowering students to become successful professionals who can embrace the university's motto and strive to achieve great things.

Adult learning has made marvelous strides in focusing on the individual and the individual's experiences. It is clear that adult learners hold the key to understanding learning.

The evolution of learning strategy preferences is pointing toward assisting learners and facilitators to understand how the learner can optimize learning abilities. The successes with ATLAS and the data it can provide are evident in many doctoral dissertations. The ATLAS tool and the knowledge of learning strategy preferences resound with learners. It is changing learners' perceptions of themselves as students and is further empowering students to use metacognition to understand how they learn. Furthermore, ATLAS and the theory base of ATLAS was a good predictor of stress.

Metacognition is a powerful concept and has resonated with this study. Students can begin to make conscious decisions about their knowledge and connect new information to former knowledge. The process of better understanding

oneself is important as students make career choices, and further highlights the importance of understanding the self in professional training and later in a career. Further study with metacognition and ATLAS offers unlimited potential to discover if better career choices and learning approaches can be made when students use metacognition.

Many fields, especially those with a behavioral or scientific base, are not looking at stress predictability currently. It is important to study stress through an educational theory base. Further study is also needed to search for other variables that can be used to predict stress or to confirm there are no other variables in predicting stress.

In Maslow's (1970) hierarchy of human needs, the humanistic psychology approach centers upon growth, even though the growth may be disrupted as a person moves up and down the hierarchy. The self-actualization level comprises self-fulfillment, knowledge and understanding, and aesthetics. Aesthetics is that of being surrounded by beauty, including literature, art and music. The knowledge and understanding category that Maslow (1970) reveals is in regard to "the need to satisfy curiosity, explore, discover and find solutions". He also states that people tend to "look for relationships and meaning, seek intellectual

challenges, analyze information" (p. 9). Maslow defines self-actualization as "the full use and exploitation of one's talents, capacities and potentialities" (1970, p. 10). Brookfield (1986) also notes a similar progression of growth:

The assumption is that if you are successful in changing adults' perceptions of the world in which they live, you will not need to teach adults to acquire new skills and knowledge—they will be eager to discover these for themselves (1986, p. 248).

The radical growth for the field of adult education as noted by J. Roby Kidd (1983) has begun a noticeable "paradigm shift" from looking at adult education to concentrating on adult learning. This exciting growth for the field of education was described by Kidd as going through a period of "perspective transformation" and likens the transformation to taking a "leap in consciousness" (Fellenz & Conti, 1989, p. 1). Whether or not students ever achieve self-actualization or fully engage metacognition, they are however making their own leap of consciousness.

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APPENDICES

APPENDIX A

PARTICIPANT INFORMATION SHEET AND ANSWER FORM

Name: _____
 Age: ____
 Gender: ___ Male ___ Female
 Program (circle): MED NUR OT PHARM PH PT
 Year in Program: 1 2 3 4
 Race: ___ African American ___ Hispanic ___ Native American ___ White ___ Asian ___ Other
 Status: ___ Single ___ Not Single
 Average hours working (per week): ____
 Average hours studying (per week): ____

ATLAS

Directions: Place a check next to your learning subgroup as indicated on ATLAS.

Navigator		Problem Solver		Engager	
<input type="checkbox"/> Subgroup 1	<input type="checkbox"/> Subgroup 2	<input type="checkbox"/> Subgroup 1	<input type="checkbox"/> Subgroup 2	<input type="checkbox"/> Subgroup 1	<input type="checkbox"/> Subgroup 2

Accuracy: Is the description of your learning strategy group of ATLAS accurate in describing you as a learner? ___ Yes ___ No

Student Life Stress Inventory

Before scoring the inventory, please rate your overall perceived level of stress:

MILD MODERATE SEVERE

Directions: Circle the number for each statement to record your level of experiences on the 5-point scale: 1= Never, 2= Seldom, 3 = Occasionally, 4 = Often, and 5 = Most of the time. For example, 1 2 3 4 5.

- | | | | |
|---------------|---------------|---------------|---------------|
| 1. 1 2 3 4 5 | 14. 1 2 3 4 5 | 27. 1 2 3 4 5 | 40. 1 2 3 4 5 |
| 2. 1 2 3 4 5 | 15. 1 2 3 4 5 | 28. 1 2 3 4 5 | 41. 1 2 3 4 5 |
| 3. 1 2 3 4 5 | 16. 1 2 3 4 5 | 29. 1 2 3 4 5 | 42. 1 2 3 4 5 |
| 4. 1 2 3 4 5 | 17. 1 2 3 4 5 | 30. 1 2 3 4 5 | 43. 1 2 3 4 5 |
| 5. 1 2 3 4 5 | 18. 1 2 3 4 5 | 31. 1 2 3 4 5 | 44. 1 2 3 4 5 |
| 6. 1 2 3 4 5 | 19. 1 2 3 4 5 | 32. 1 2 3 4 5 | 45. 1 2 3 4 5 |
| 7. 1 2 3 4 5 | 20. 1 2 3 4 5 | 33. 1 2 3 4 5 | 46. 1 2 3 4 5 |
| 8. 1 2 3 4 5 | 21. 1 2 3 4 5 | 34. 1 2 3 4 5 | 47. 1 2 3 4 5 |
| 9. 1 2 3 4 5 | 22. 1 2 3 4 5 | 35. 1 2 3 4 5 | 48. 1 2 3 4 5 |
| 10. 1 2 3 4 5 | 23. 1 2 3 4 5 | 36. 1 2 3 4 5 | 49. 1 2 3 4 5 |
| 11. 1 2 3 4 5 | 24. 1 2 3 4 5 | 37. 1 2 3 4 5 | 50. 1 2 3 4 5 |
| 12. 1 2 3 4 5 | 25. 1 2 3 4 5 | 38. 1 2 3 4 5 | 51. 1 2 3 4 5 |
| 13. 1 2 3 4 5 | 26. 1 2 3 4 5 | 39. 1 2 3 4 5 | |

APPENDIX B
STUDENT-LIFE STRESS INVENTORY

Student-Life Stress Inventory

This inventory contains statements dealing with student-life stress. Read it carefully and respond to each statement as it has related or is relating to you as a student. Use the 5-point scale which indicates the level of your experiences with 1 = never, 2 = seldom, 3 = occasionally, 4 = often, and 5 = most of the time. Record your responses on the accompanying answer sheet.

I. STRESSORS:

A. As a student:

1. I have experienced frustrations due to delays in reaching my goals.
2. I have experienced daily hassles which affected me in reaching my goals.
3. I have experienced lack of sources (money for auto, books, etc.).
4. I have experienced failures in accomplishing the goals that I set.
5. I have not been accepted socially (become a social outcast).
6. I have experienced dating frustrations.
7. I feel I was denied opportunities in spite of my qualifications.

B. I have experienced conflicts which were:

8. Produced by two or more desirable alternatives.
9. Produced by two or more undesirable alternatives.
10. Produced when a goal had both positive and negative alternatives

C. I experienced pressures:

11. As a result of competition (on grades, work relationships with spouse and/or friends).
12. Due to deadlines (papers due, payments to be made, etc.)
13. Due to an overload (attempting too many things at one time).
14. Due to interpersonal relationships (family and/or friends expectations, work responsibilities).

D. I have experienced:

15. Rapid unpleasant changes.
16. Too many changes occurring at the same time.
17. Changes which disrupted my life and/or goals.

E. As a person:

18. I like to compete and win.
19. I like to be noticed and loved by all.
20. I worry a lot about everything and everybody.
21. I have a tendency to procrastinate (put off things that have to be done).
22. I feel I must find a perfect solution to the problems I undertake.
23. I worry and get anxious about taking tests.

II. REACTIONS TO STRESSORS:

F. During stressful situations. I have experienced the following:

24. Sweating (sweaty palms, etc.)
25. Stuttering (not being able to speak clearly)
26. Trembling (being nervous, biting fingernails, etc.).
27. Rapid movements (moving quickly from place to place).
28. Exhaustion (worn out, burned out)
29. Irritable bowels, peptic ulcers, etc.,
30. Asthma, bronchial spasms, hyperventilation.
31. Backaches, muscle tightness (cramps), teeth grinding.
32. Hives, skin itching, allergies
33. Migraine headaches, hypertension, rapid heartbeat.
34. Arthritis, overall pains.
35. Viruses, colds, flu.
36. Weight loss (can't eat)
37. Weight gain (eat a lot)

G. When under stressful situations. I have experienced:

38. Fear, anxiety, worry
39. Anger
40. Guilt
41. Grief, depression

H. When under stressful situations. I have:

42. Cried
43. Abused others (verbally and/or physically)
44. Abused self (use of drugs, etc.).
45. Smoked excessively.

- 46. Was irritable towards others.
- 47. Attempted suicide.
- 48. Used defense mechanisms
- 49. Separated myself from others.

I. With reference to stressful situations. I have:

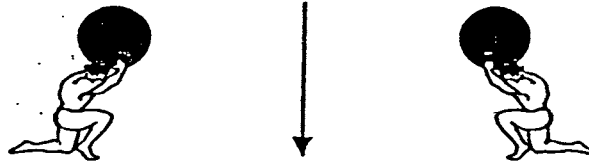
- 50. Thought and analyzed about how stressful the situations were.
- 51. Thought and analyzed whether the strategies I used were most effective.

APPENDIX C
ATLAS INSTRUMENT

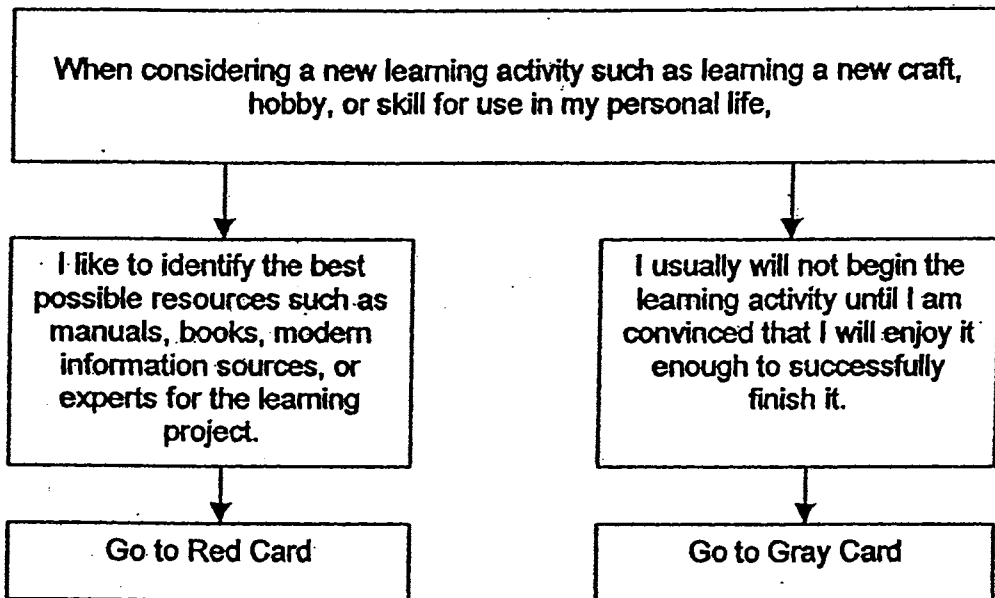
ATLAS

(Assessing The Learning Strategies of Adults)

Directions: The following colored cards have statements on them related to learning in real-life situations in which you control the learning situation. These are situations that are not in a formal school. For each one, select the response that best fits you, and follow the arrows to the next colored card that you should use. Only read the cards to which you are sent. Continue this process until you come to the Groups of Learners sheet. Along the way, you will learn about the group in which you belong. Follow the arrow to start.

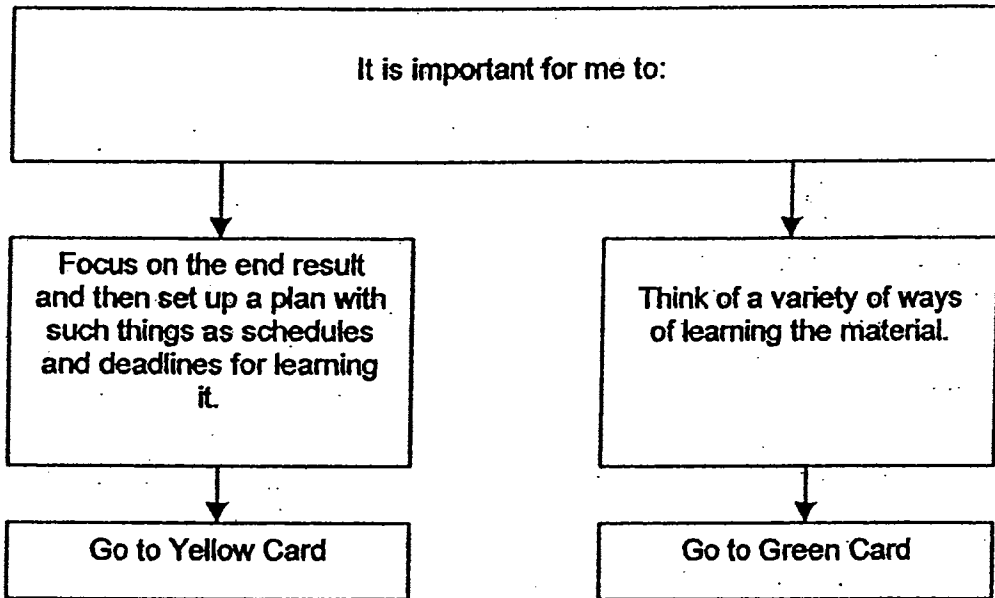


Printed on Cool BLUE card stock



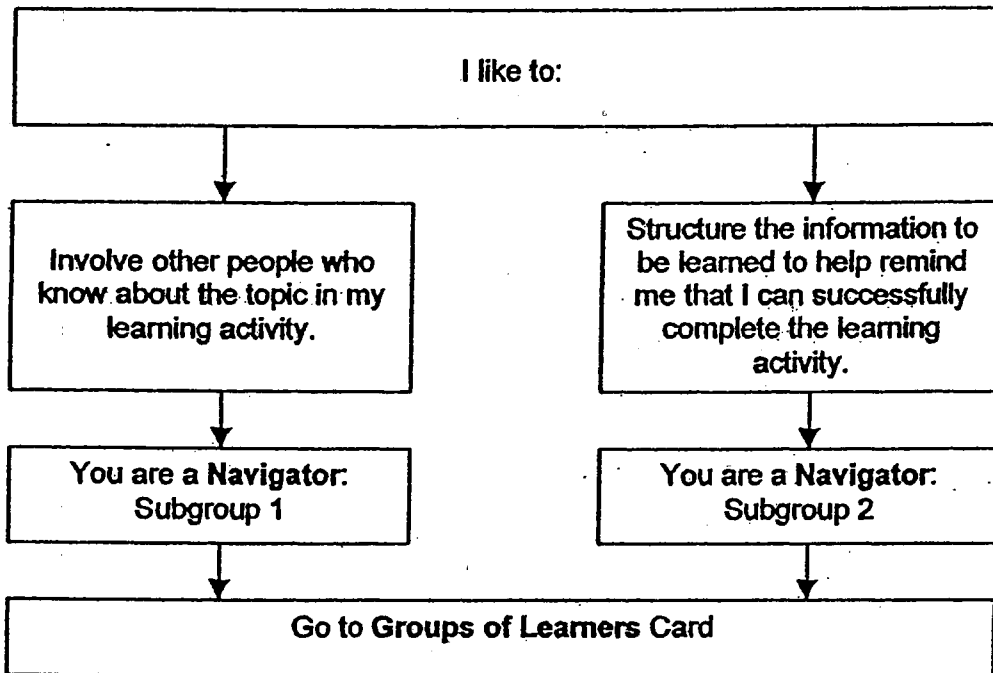
Page 1 of ATLAS

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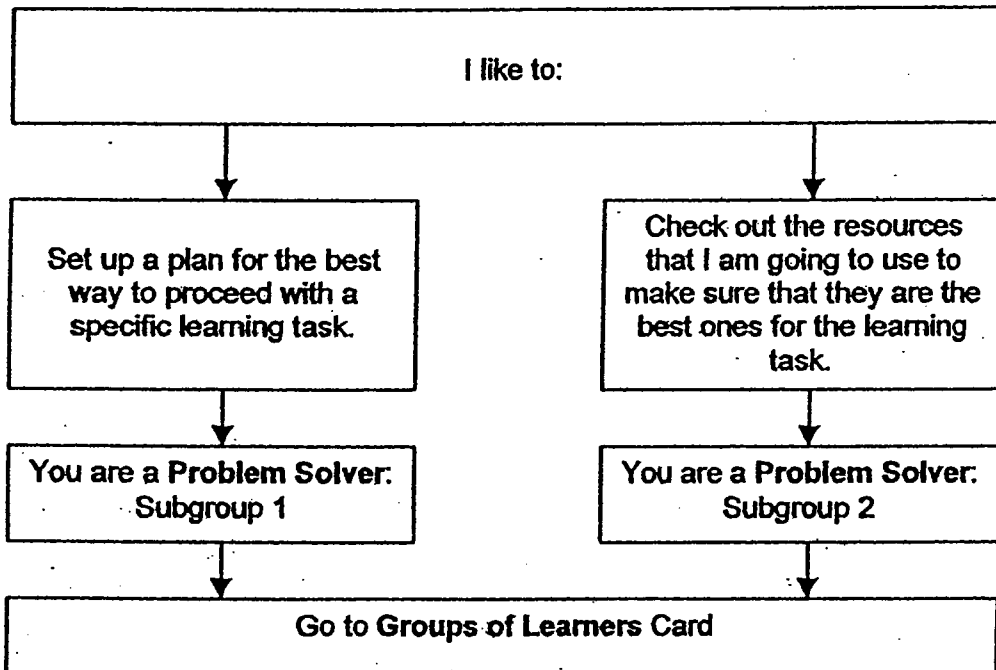
Page 2 of ATLAS

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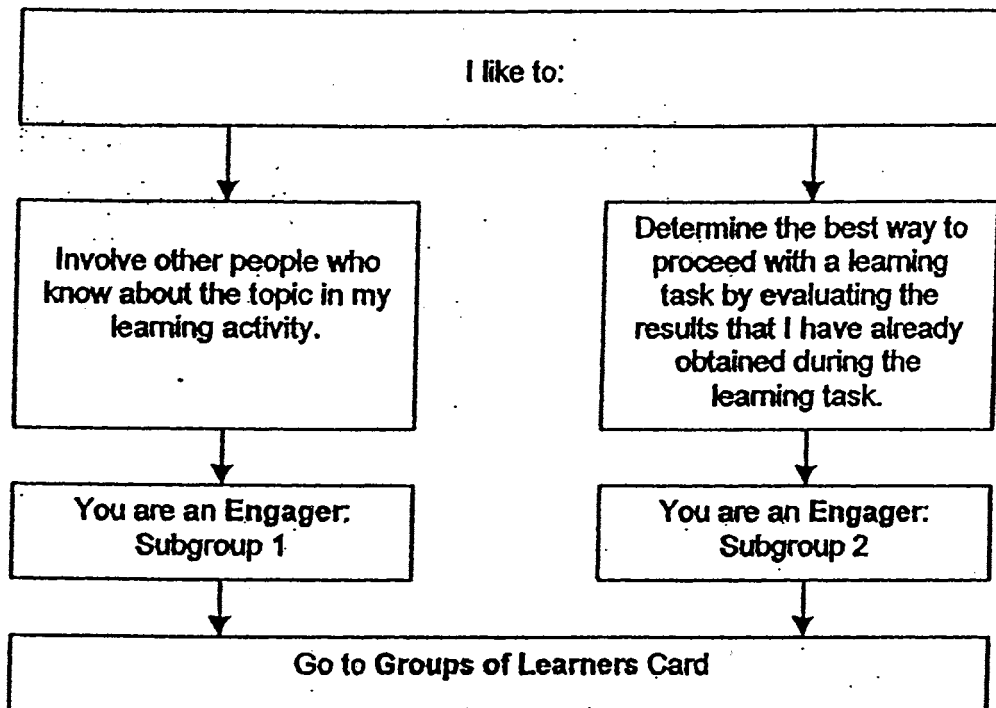
Page 3 of ATLAS

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Page 4 of ATLAS

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Page 5 of ATLAS

Navigators

Description: Focused learners who chart a course for learning and follow it. Subgroup 1 likes to use human resources while Subgroup 2 is more concerned with the organization of the material into meaningful patterns.

Characteristics: Focus on the learning process that is external to them by relying heavily on planning and monitoring the learning task, on identifying resources, and on the critical use of resources.

Instructor: Schedules and deadlines helpful. Outlining objectives and expectations, summarizing main points, giving prompt feedback, and preparing instructional situation for subsequent lessons.



Problem Solvers



Description: Learners who rely heavily on all the strategies in the area of critical thinking. Subgroup 1 likes to plan for the best way to proceed with the learning task while Subgroup 2 is more concerned with assuring that they use the most appropriate resources for the learning task.

Characteristics: Test assumptions, generate alternatives, practice conditional acceptance, as well as adjusting their learning process, use many external aids, and identify many of resources. Like to use human resources and usually do not do well on multiple-choice tests.

Instructor: Provide an environment of practical experimentation, give examples from personal experience, and assess learning with open-ended questions and problem-solving activities.

Engagers

Description: Passionate learners who love to learn, learn with feeling, and learn best when actively engaged in a meaningful manner. Subgroup 1 likes to use human resources while Subgroup 2 favors reflecting upon the results of the learning and planning for the best way to learn.

Characteristics: Must have an internal sense of the importance of the learning to them personally before getting involved in the learning. Once confident of the value of the learning, likes to maintain a focus on the material to be learned. Operates out of the Affective Domain related to learning.

Instructor: Provide an atmosphere that creates a relationship between the learner, the task, and the teacher. Focus on learning rather than evaluation and encourage personal exploration for learning. Group work also helps to create a positive environment.



GROUPS OF LEARNERS

REQUEST FOR PERMISSION TO USE STUDENT-LIFE STRESS
INVENTORY IN A STUDY
Copyrighted Material

Description:

Author's Full Name; Bernadette M. Gadzella

Title of the Instrument: Student-life Stress Inventory

Title of the Journal: Psychological Reports

Date: April 1994, Volume 74(2) Page: 395-402

Publisher of article: Psychological Reports

Permission is hereby granted for Michelle Taylor
to use the instrument described above for her research
study. It is understood the the use of this material is
limited to the specified purpose and is limited to a one
time use only basis.

Date: Dec. 11, 2000

Signed: Bernadette M. Gadzella

Bernadette M. Gadzella, Ph.D.
Copyright Holder

APPENDIX D
INSTITUTIONAL REVIEW BOARD APPROVAL

Oklahoma State University
Institutional Review Board

Protocol Expires: 7/8/02

Date: Monday, July 09, 2001

IRB Application No ED01141

Proposal Title: LEARNING STRATEGIES AND STRESS OF HEALTH SCIENCE STUDENTS

Principal
Investigator(s):

Michelle K. Taylor
4502 E. 41st
Tusla, OK 74135

Gary Conti
206 Willard
Stillwater, OK 74078

Reviewed and
Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Dear PI :

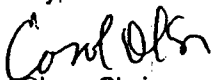
Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved projects are subject to monitoring by the IRB. If you have questions about the IRB procedures or need any assistance from the Board, please contact Sharon Bacher, the Executive Secretary to the IRB, in 203 Whitehurst (phone: 405-744-5700, sbacher@okstate.edu).

Sincerely,



Carol Olson, Chair
Institutional Review Board

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VITA

Michelle K. Taylor

Candidate for the Degree of

Doctor of Education

Thesis: HEALTH CARE EDUCATION: UNDERSTANDING GRADUATE
STUDENTS' STRESS AND LEARNING STRATEGY
PREFERENCES

Major Field: Occupational and Adult Education

Biographical:

Education: Graduated from Healdton High School, Healdton, Oklahoma in May 1991; received Bachelor of Science degree in Communication Sciences and Disorders from The University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma, in May 1995; received Master of Human Relations degree from The University of Oklahoma in Norman, Oklahoma, in May 1998. Completed the requirements for the Doctor of Education degree with a major in Occupational and Adult Education at Oklahoma State University, Stillwater, Oklahoma, in May 2004.

Experience: Employed as assistant director for academic and student services for the College of Allied Health at The University of Oklahoma, Tulsa, Oklahoma from 1998 to present. Employed as adjunct professor of Business Administration specializing in behavioral science at Langston University, Tulsa, Oklahoma from 1999 to present. Employed as adjunct professor of Human Relations at The University of Oklahoma, 2004 to present.

Professional Licensure: Fulfilled the requirements for Licensed Professional Counselor in November 2000, license number 2467 from the Oklahoma State Department of Health.