

THE STRESSES OF VETERINARY TRAINING AND SIGNIFICANT INTIMATE
RELATIONSHIPS: IMPLICATIONS FOR THE PRACTICE OF
MARRIAGE & FAMILY THERAPISTS

by

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B.S., Kansas State University, 1987
M.Ed., University of Minnesota, 1992
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AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Family Studies and Human Services
College of Human Ecology

KANSAS STATE UNIVERSITY
Manhattan, Kansas

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Abstract

Until recently, minimal research has been done regarding the impact of veterinary student stress on the student's significant intimate relationships. In this study of 466 veterinary students enrolled in five different accredited U.S. Colleges of Veterinary Medicine, the association of five primary variables, perceived stress, self-esteem, academic satisfaction, relationship satisfaction, and general life satisfaction was investigated, utilizing McCubbin and Patterson's (1983) Double ABCX Model as a guide. Six of the seven hypotheses were supported and further regression analysis yielded a model of variable associations that supported the Double ABCX Model, though significant gender differences were found. Specifically, female students perceived significantly more stress than did male students. With the exception of academic satisfaction and relationship satisfaction, all of the major variables were strongly correlated with each other. For the women, who comprised a significant majority of the sample, perceived stress had a significant impact on relationship satisfaction, as well as on self-esteem, which in turn significantly impacted academic satisfaction. Relationship satisfaction and academic satisfaction both significantly, and separately, impacted general life satisfaction, suggesting that relationship satisfaction and academic satisfaction are different constructs that operate independently of each other. However, both have a significant impact upon and are significantly associated with general life satisfaction, suggesting that neither can be neglected during veterinary training if a positive outcome is desired. For the men in this sample, stress impacted directly upon academic satisfaction, self-esteem, and general life satisfaction but did not have a direct impact upon relationship satisfaction. Instead, relationship satisfaction and general life satisfaction had a highly correlated relationship, with both significantly and strongly associated with the other. Although academic satisfaction and relationship satisfaction appear to be two separate entities, they are both important elements to achieving general life satisfaction during veterinary training and, therefore, should be equally attended to during the training process. These findings are interpreted and discussed in light of the

implications for and importance of continued collaboration between veterinary students and programs and the field of Marriage and Family Therapy in an effort to understand and support students and their significant relationships during the veterinary training process.

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Dedication

To those who've given me both roots and wings:

Chet

Chris, Jake, Em, and Zach

Mom and Dad

Daryl and Mary Beth

I love you.

CHAPTER 1 - INTRODUCTION

As a mental health professional in a veterinary training facility, the author witnessed it over and over again: students and clinicians giving of themselves unselfishly to the point of exhaustion, in an effort to help their clients and beloved animal patients. Without fail, it seemed, those who gave the most of themselves to their chosen profession, were those who were most likely to end up in my office, lamenting the loss of yet another significant relationship, yet another important person who'd left them not understanding or appreciating the sacrifices and demands of veterinary medicine. A Dean of Student Affairs at one of these training programs expressed deep concern that so many of his students experienced the loss of a significant intimate relationship during their training. He wondered what it was about the training program, or those who pursued it, that caused so many relational break-ups. Yet, there were a significant number of students and clinicians, who seemed to sail through their training, who reported proudly that they could not have survived the training process without the support of their significant other, and whose significant other was a visible part of their lives – bringing sack lunches/ dinners, taking care of children, cheering them on from the sidelines. These trainees and clinicians were no less busy than the others, no less dedicated to their profession. What is the difference between these two sets of people? Why is it that some experienced a pattern of relational failures during this intensive training process, while others' relationships seemed to thrive under the same conditions? Is there something that can be done to help those whose relationships are tenuous to make them stronger so that they can serve as a buffer of other stresses, rather than an exacerbation?

There is no doubt that veterinary training is a strenuous process. It involves four years of rigorous scientific training, including one intensive year of supervised practice in which the student is expected to remember and utilize all of the training they've had over the past three years to help and, hopefully cure their animal patients (author's personal observations, and College of Veterinary Medicine and Biological Sciences (CVMBS), Description of PVM (Professional Veterinary Medicine) Program, 2005). Some pursue additional training with an Internship or Residency (or even a Doctorate). The process is similar to, though not exactly like, that of the human medical training process but there is no corollary to the field of psychiatry in

regard to understanding the impact of the stresses of training and practice upon students and clinicians. Thus, there is a paucity of information upon which to draw when attempting to design programs or assist students who are experiencing these stresses.

Specifically, there is a dearth of research about veterinary trainees or veterinarians and their significant human relationships. Indeed, prior to 2005, there was only one published research article about the effects of gender differences in married veterinarians on job satisfaction and work-related stress (Phillips-Miller, Campbell, & Morrison, 2000). These researchers found that female veterinarians perceived more stress from their marriage and family impacting on their career and less spousal support for their career. Three dissertations, in which subjects were veterinary students, generally supported the Phillips-Miller et al. findings (Kent-Arce, 1991; Melbo, 1981; Wimberly, 1991), suggesting that there is a considerable amount of stress accompanying veterinary training for both genders, though the Melbo study suggested that female students experience significantly higher levels of stress. One other large-scale study of veterinary students (Cron, Slocum, Goodnight, & Volk, 1999) raised the question of the impact of veterinary training on trainees' self-esteem, as the researchers found that self-esteem levels of fourth year students were lower, overall, than were the self-esteem levels of first year students. As self-esteem appeared to be directly correlated with earnings potential of the professional veterinarians in the same study, this was deemed an issue of importance for further study, according to the authors.

The Summer 2005 issue of the *Journal of Veterinary Medical Education* (American Association of Veterinary Medical Colleges (AAVMC)) was dedicated to the topic of veterinary student stress, and included eight articles that specifically addressed this topic. Researchers at veterinary training programs in the United States and Australia provided information about veterinary student stress and how to measure it, as well as suggestions for helping students cope with the stresses they experience. Another recent article (Hafen, Reisbig, White, & Rush, in press) considered predictors of depression and anxiety in first year students, and offered suggestions for intervention to improve veterinary student well being.

Due to the relative lack of research about veterinarians and veterinary trainees, it was necessary to access other areas of research in related fields, such as graduate/ professional study and medical school. Unfortunately, there appears to be only one published study that examines stress levels in graduate students. Kreger (1995) found that stress levels tend to decrease across

graduate studies, perhaps because students adapt to this lifestyle. Kreger's sample was rather small (29), and the results of his study contradict those of Kent-Arce (1991), who found that veterinary students report that the third year of study is the most stressful year, followed by the fourth year.

Within the volumes of research that have been conducted on students of human medicine, findings about stress levels have been somewhat mixed. Paget (1869) was the first to conduct and publish "research" about the impact of training on student and professional well being. He ultimately concluded that the most important element in determining on-going well-being and success of his former students was the "personal character" of the individual. More recent studies of medical students support Paget's conclusions. For instance, Clark and Zeldow (1989) stated that "a personality cluster of self-esteem, locus of control, and self-confidence predicts medical student well-being" (p. 2066). Marchand, Palmer, Gutmann, and Brogan (1985), proposed that the same personality characteristics that encouraged individuals to pursue medical training also potentially predispose them to mental health problems. A sizeable number of other researchers have supported this contention, suggesting that at least 13% of medical students experience significant levels of psychological distress during the training process (Adsett, 1968; Clark & Zeldow, 1988; Davidson, 1978; Firth-Cozens, 1989; Gerstein & Russell, 1990; Kutcher, 1984; Marchand et al., 1985; Sacks, Frosch, Kesselman, & Parker, 1980). Some researchers found evidence of distress in up to 36% of their surveyed population (Firth, 1986; Firth-Cozens, 1989; Firth-Cozens, Moss, Rayner, & Paice, 2000; Wolf, 1994).

In regard to the impact of unchangeable personal characteristics, such as gender and ethnicity, on stress levels of medical students, findings have also been mixed. Some studies have suggested that women medical students experience more stress than do male medical students (Adsett, 1968; Gaensbauer & Mizner, 1980; Lloyd & Gartrell, 1983). However, though Notman, Salt, and Nadelson's (1984) findings concurred, these researchers also reminded readers that women, in general, are more outwardly expressive about stress than men and, therefore, may not actually be experiencing more stress, but just talking about it more openly. Then again, in a study of female doctors, Firth-Cozens (1990) reported that her subjects, while not more stressed than their male counterparts as students, reported dramatically higher levels of stress once they started practicing. Firth-Cozen's subjects did not attribute their problems to their career, per se, but to

their desire to have a family and the difficulties with balancing the multiple demands that come with trying to combine the two lifestyles.

Though ethnicity has been a topic of much interest in many areas of study, there have not been many studies of the impact of ethnicity on medical trainees' stress levels. Indeed, there is only one published study of this kind. Pyskoty, Richman, and Flaherty (1990) reported that, though minority students have an advantage over majority students when they first enter medical school (i.e., higher self-esteem and more social support), these advantages quickly fade away, potentially leaving these students more vulnerable to stress over the course of their training.

On the other hand, perhaps it is the training process itself that is mostly responsible for the stress levels students experience as they go through it. Before considering this possibility, though, it is important to inquire if, indeed, medical studies are more stressful than the study of any other professional training program. Several researchers have explored this issue and have come to the conclusion that, though all professional curriculums are stressful, medical study may not be the most stressful program. For example, Heins, Fahey, and Leiden (1984) discovered that law students reported higher levels of stress than did medical students or graduate students in chemistry or psychology. Bjorksten, Sutherland, Miller, and Stewart's (1983) subjects (students of a variety of medical professions) reported similar types and levels of stress, but medical students complained more frequently.

There is consensus that the most stressful part of medical training is the academics (Bjorksten et al., 1983; Coburn & Jovaisas, 1975; Edwards & Zimet, 1976; Gerstein & Russell, 1990; Heins et al., 1984; Lloyd & Gartrell, 1983; Murphy, Nadelson, & Notman, 1984; Notman et al., 1984; Radcliffe & Lester, 2003). Patient issues are commonly cited as a close second (Carmel & Bernstein, 1987; Firth, 1986; Firth-Cozens, 1989; Gerstein & Russell, 1990; Notman et al., 1984; Schwartz, Swartzburg, Lieb, and Slaby, 1987). Lack of time was found to be another commonly reported frustration (Bjorksten et al., 1983; Carmel & Bernstein, 1987; Edwards & Zimet, 1976; Firth, 1986; Heins et al., 1984; Lloyd & Gartrell, 1983; Murphy et al., 1984; Schwartz, Black, Goldstein, Jozefowicz, & Emmings, 1987). In contrast, there was little consensus among researchers that any particular year of medical training was most stressful. Instead, each year of study has its own set of stresses that make it uniquely difficult for some students. The stress experienced by students may have more to do with their expectations of medical training, and how closely their experience of training fits their expectations. This was

suggested by Gottheil, Thornton, Conly, and Cornelison (1969), who found that academic stress was highly correlated with other types of stress and that medical student expectations about training had a significant impact upon their perception of stress. Medical student relationships with clinical supervisors may be an important factor in this regard (Wells, 1989).

Other relationships may be important as well. Though a couple of studies did not find any relationship between level of stress experienced during medical training and marital status (Carmel & Bernstein, 1987; Katz, Monnier, Libet, Shaw, & Beach, 2000), many studies have reported significant correlations between these variables. Specifically, a number of researchers report that personal relationships suffer during the course of medical study (Adsett, 1968; Bjorksten et al., 1983; Gaensbauer & Mizner, 1980; Marchand et al., 1985; Murphey et al., 1984; Notman et al., 1984; Pyskoty et al., 1990; Vitaliano, Maiuro, Russo, & Mitchell, 1989; Wells, 1989; Wolf, 1994). Interestingly, though, other researchers have reported that married students experience lower levels of stress than do non-married students (Bjorksten et al., 1983; Carmel & Bernstein, 1987; Coombs & Fawzy, 1982; Firth-Cozens, 1994b; Katz et al., 2000; Tyssen, Vaglum, Gronvold, & Ekeberg, 2000; Tyssen, Vaglum, Gronvold, & Ekeberg, 2001a; Tyssen, Vaglum, Gronvold, & Ekeberg, 2001b; Tyssen & Vaglum, 2002; Wolf, von Almen, Faucett, & Randall, 1991).

Of course, as the Double ABCX Model (McCubbin & Patterson, 1983; Appendix A) suggests, a discussion about stress would not be complete without considering the system's coping abilities. There are a variety of ways that people cope with stress, none of which is inherently better than any other, though how well a coping strategy fits the situation will determine its success (Folkman & Moskowitz, 2004). One's choice of coping strategy is determined by a multitude of factors, past and present. This is as true for veterinary trainees as for anyone else. Unfortunately, there have been few studies of veterinary student or professional coping. Brown's (1994) findings supported those of other researchers' who had measured coping utilizing the Ways of Coping questionnaire (Folkman & Lazarus, 1980), in terms of verifying five styles of coping methods (problem solving, seeking emotional support, wishful thinking, detachment, and positive focus). However, Brown found that her subjects (first and third year veterinary students) did not utilize positive focus to the extent that other subjects in other studies had. Brown suggested that this could be unique to veterinary students or could be because of the "flexibility" of her particular subjects in dealing with stress. A more recent study that examined

coping in Australian veterinary students (Williams, Arnold, & Mills, 2005) found that these students reported moderate levels of stress and were more likely to utilize adaptive coping measures than not.

Two dissertation studies also looked at the coping strategies of veterinary students (Berney, 1998; Welsch, 1999). Their findings were somewhat contradictory, at least in regard to the impact of gender on coping style. Berney (1998) found no significant differences between genders, but was able to discern that an “escape-avoidant” coping style was significantly predictive of “low hardiness” in her subjects. Welsch (1999), on the other hand, found significant differences in coping between genders in her study of equine veterinarians, with women reporting both higher job satisfaction and higher stress levels. She also reported that the men in her study tended to utilize problem-focused coping styles to deal with their stress, while women tended to utilize emotion-focused coping styles. According to Welsch (p. 21), problem-focused coping is rational and detached, and “attempts to modify or eliminate the source of stress by taking instrumental actions (Miller & Kirsch, 1987) through direct actions or help-seeking behaviors (Havlovic & Keenan, 1995),” while emotion-focused coping “attempts to control or repress stress related emotions and maintain affective equilibrium (Billings & Moos, 1984) via positive thinking or avoidance/ resignation (Havlovic & Keenan, 1995).” Studies of coping among other populations, such as graduate students, have produced similarly contradictory findings, though Gerson (1998) and Nelson, Dell’Oliver, Koch, and Buckler (2001) both reported that women tend to be “hardier” students, despite their more common use of emotion-focused coping methods.

Studies of coping among medical students have produced contradictory results as well, though several (Brown, 1994; Niemi & Vainiomaeki, 1999; Park and Adler, 2003) reported consistency in the coping strategies used over time. Becker (1995) and others (Mosley, Perrin, Neral, & Dubbert, et al., 1994) found support for the utilization of engaged rather than avoidant or confrontive coping strategies, as subjects who chose engagement strategies were less likely to be depressed. More broadly, most of the studies of coping in the research on medical students suggested a strong correlation between coping strategy and subject health and well-being, and supported general findings that certain types of coping strategies may not be as effective as others in some situations.

Stress and coping of the veterinary trainee is only part of the story however. A student's significant intimate relationship may also exert an impact, either positive or negative, upon the student's ability to manage stress. It is a fairly safe assumption that the majority of veterinary trainee committed relationships are "dual-career" relationships, in which both individuals either work or attend school (or both). The stresses of dual-career relationships are well-documented, though again, there have been no studies of this phenomenon within the veterinary field. Thus, we turn again to studies of those within the human medical realm for corollary information. Though it has been suggested that doctors may have a difficult time balancing the many demands placed upon them by their careers and relationships (Derdeyn, 1979), several studies have raised doubts as to whether the demands of a medical career have a negative impact upon marital satisfaction (Doherty & Burge, 1989; Gabbard, Menninger, & Coyne, 1987; Horowitz, McLaughlin, & White, 1997; Leiter & Durup, 1996). Perhaps, as with stress levels experienced during medical school, marital satisfaction may be impacted more by how accurate expectations about the training process were, than by the actual demands placed upon the trainee, particularly if the individuals in the relationship feel positive about the relationship and perceive few problems within it.

However, for those whose intimate relationships are problematic, stress may increase substantially, and mental health problems may result. Several studies of medical students and their spouses have reported a strong correlation between stress levels and depressive symptoms of either or both the student and spouse (Beach, Martin, Blum, & Roman, 1993; Coombs & Fawzy, 1982; Horowitz et al., 1997; Katz, Beach, Smith, & Myers, 1997; Katz et al., 2000). A finding of particular interest, is that women tend to be more affected by relational distress than are men (Horowitz et al., 1997; Melbo, 1981; Phillips-Miller et al., 2000; Smith, Andrasik, & Quinn, 1988; Wimberley, 1991). This is important as, currently, 75% of veterinary students are women (AAVMC, 2003).

Fortunately, however, many studies have reported a strong correlation between good mental health and satisfactory intimate relationships (see Katz et al., 2000; Kelloway & Barling, 1994). Interestingly, Coombs and Fawzy (1982) found that married students reported lower levels of stress overall than did the single students in their study. In addition, formerly single students reported that their stress levels decreased after marriage. Indeed, the marital relationship was cited as the most important source of support by subjects from several studies (see Beach et

al., 1993; Katz et al., 1997). It appears, then, that sometimes the stresses of veterinary training may exacerbate, or be exacerbated by, the student's intimate relationship, while those with a satisfactory intimate relationship may experience less stress, during their training, as a result of the buffering effect of that relationship.

The aim of the present study was to learn more about the association of the stresses of veterinary training and significant intimate relationships and the factors that may mediate the relationship between these two major variables. The theoretical framework for this study was the Double ABCX Model (McCubbin & Patterson, 1983; Appendix A), which proposes that, over time, a system's perception of the pile-up of stresses, and the perception of the resources available to manage those stresses, as mediated by the system's coping ability, determines the system's ability to adapt to the stress it faces. The subjects for this study were students enrolled in five of the 28 veterinary training programs in the United States. An e-mail containing a link to a web-based survey was forwarded to the subjects via the Dean at each training program. The survey utilized several well-known and standardized survey instruments, including the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983), the Rosenberg Self-Esteem Scale (Rosenberg, 1965), the Kansas Marital Satisfaction Scale (Schumm, Bollman, & Jurich, 1983), the Perceived Quality of Academic Life Scale (Okun, Kardash, Stock, Sandler, & Baumann, 1986), and the Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). Various demographics were also collected to help determine if there were specific personal differences that were critical in some way. After calculating basic descriptive statistics, simple correlations between variables were determined, and then various multiple regressions were performed to ascertain which model best described how the variables interacted.

Operational Definitions of Variables

For the purposes of this study, the following terms were defined thus:

Stressor – A life event that has impacted the family system, and that produced, or had the potential to produce, change within the system. Generally a hardship, stressors create demands that are specific to it. Examples of stressors include a death in the family, marriage, the birth of a child, a job change, divorce, and education (McCubbin & Patterson, 1983). For this study, it is assumed that all subjects surveyed were experiencing similar stresses in regard to their training,

as the veterinary training curriculum is fairly standardized across programs. Other possible stressors were identified via some of the demographic questions.

Perceived Stress – The degree to which situations in one’s life were appraised as stressful, such that the situation was deemed as threatening or demanding in some way, and resources were judged to be insufficient to cope with the situation. Stress is the cognitively mediated emotional response to the event, not the event itself (Cohen et al., 1983). Therefore, the perception of stress is personal and contextual, rather than objective, and may be different for each person, and/ or different for the same person at different times or under different circumstances. Others may identify that an individual is feeling stressed, based upon expressed negative affect such as anger, upset, and nervousness (Hewett, Flett, & Mosher, 1992). This variable was measured using the Perceived Stress Scale (Cohen et al., 1983).

Coping – The ways in which an individual attempts to deal with and overcome problems and difficulties (Webster, 1981). An individual’s ability, or lack thereof, to control stressful situations (Hewett et al., 1992). The thoughts and behaviors used to manage the internal and external demands of situations that were appraised as stressful (Folkman & Moskowitz, 2004). This variable was also measured with the Perceived Stress Scale (Cohen et al., 1983), though no separate coping score was determined for subjects. Rather, it was assumed that an individual’s coping would offset their perceived stress.

Self-esteem – An individual’s belief that she or he is an important, competent, powerful, and worthwhile person who is valued and appreciated (Seifert, Hoffnung, & Hoffnung, 1997, p. G-7). This is paraphrased as one’s degree of feelings of self-worth (Rosenberg, 1965). This variable was measured by the Rosenberg Self-Esteem Scale (Rosenberg, 1965).

Significant Intimate Relationship – a committed (as defined by the individual subject) relationship between two adults, which includes but is not limited to marriage, as legally defined.

Relational Satisfaction – A measurement of the degree of satisfaction or discord reported by individuals within a committed or quasi-committed relationship. Relational Satisfaction is similar to “dyadic satisfaction,” which is defined as a combined measure of those affective traits that lead to a relationship that provides such attributes as positive dyadic adjustment, absence of discord, positive mutual regard, affection, compatibility, sexuality, identity, trust and respect, harmony, homemaking, financial security, salience, happiness, and love (Hunt, 1978; Rust, Bennun, Crowe, & Golombok, 1986; Rust, Bennun, Crowe, & Golombok, 1990; Waring, 1984).

This variable was measured by the Kansas Marital Satisfaction Scale (Schumm et al., 1977/2000).

Academic Satisfaction – A measure of a student’s contentment with their academic program and experience, and the degree to which his or her expectations about the program are met. The set of positive affective beliefs that a student has about the components of his or her learning experience (Okun et al., 1986). This variable was measured by the Perceived Quality of Academic Life Scale (Okun et al., 1986).

Life Satisfaction – A measure of an individual’s degree of contentment with the various aspects of their life, and the degree to which his or her expectations about these different aspects of life are met. The extent to which one perceives that the circumstances of his or her life compare to the standard that she or he has constructed for him- or herself (Pavot, Diener, Colvin, & Sandvik, 1991). A measurement of subjective well-being as measured by the Satisfaction With Life Scale (Diener et al., 1985).

Research Question and Hypotheses

There were two parts to the research question: a) What was the impact of the perceived stresses of veterinary training upon the trainee’s significant intimate relationship, and b) What was the impact of the veterinary trainee’s significant intimate relationship upon the perceived stresses of veterinary training?

The hypotheses tested with this research were as follows:

- 1) As perceived stress increases, perceived life satisfaction will decrease.
- 2) Those who are satisfied with their relationship status will report higher life satisfaction as well.
- 3) As satisfaction with significant intimate relationship increases, perceived life satisfaction will increase (Buffering hypothesis).
- 4) As perceived self-esteem increases, perceived life satisfaction will increase.
- 5) Female veterinary trainees will perceive significantly more stress during the training process than will male trainees.
- 6) As age increases, the level of stress perceived during the veterinary training process will decrease.

7) As the trainee's satisfaction with their training program increases, their perceived level of stress during the training process will decrease.

These hypotheses were tested utilizing Pearson correlations, t-tests, and chi-square statistics. A multiple regression model, based upon McCubbin and Patterson's (1983) Double ABCX model, in which Quality of Life, measured by the Satisfaction With Life Scale (Diener et al., 1985), was the criterion variable was also tested. The primary predictor variable was perceived stress, measured by the Perceived Stress Scale (Cohen et al., 1983). It was believed that Relationship Satisfaction, measured by the Kansas Marital Satisfaction Scale (Schumm et al., 1983), and Satisfaction with Training, measured by the Perceived Quality of Academic Life Scale (Okun et al., 1986), were predictor variables, though they might be merely mediating variables, in this equation. Self-Esteem, measured by the Rosenberg Self-Esteem Scale (Rosenberg, 1965) and various demographic variables were also thought to play a mediating role in this model. Thus, variables were entered in various combinations to determine which specific model best described how the stresses of veterinary training interacted with relational satisfaction and satisfaction with training to determine the level of general life satisfaction experienced by this sample of veterinary trainees.

CHAPTER 2 - REVIEW OF LITERATURE

Introduction

The Life of a Veterinary Student

Having grown up in a veterinary family and worked in veterinary teaching hospitals for over five years, the author has become very familiar with what the life of a veterinary student is like. Most, if not all, veterinary students express a strong love for animals, and many state that they've known they wanted to be a veterinarian since they were very young. Though at present, admittance to veterinary medical training programs does not require a four-year degree, 81.5% of current veterinary students have acquired at least a Bachelor's degree. Many will also have earned their veterinary technician certification. A number of them have had additional education, training, and experience – nearly 9% have earned a Master's degree, and 2.5% have earned a Doctorate. (Association of American Veterinary Medical Colleges (AAVMC), 2003). Some even cross-over from the human medical field. Thus, veterinarians tend to be a highly educated lot.

They are also a persistent group. Competition for admittance to veterinary school is fierce. It has been said that it is more difficult to get into a veterinary school than it is to get into medical school. There are 28 veterinary schools in the United States and four in Canada, each of which take an average of 81 students per year (AAVMC, 2003). A fair number of the students in any given class have applied to veterinary school more than once before being admitted. At the veterinary school with which the author was most recently affiliated, approximately 50% of those accepted (roughly 10% - 15% of the applicants) in the past five years have applied more than once (College of Veterinary Medicine and Biological Sciences (CVMBS), 2003). Several students have told the author that they applied more than three times, and indeed 5 – 10% of those accepted in the past five years have (CVMBS, 2003). The author has heard of at least one person that has applied seven times.

Once accepted, veterinary students face four grueling years of training – three years in the classroom taking the equivalent of 21 credits per semester (CVMBS, 2003), and one on clinical rotation, learning as much as they can about all the various species of animals they may be called upon to treat once they graduate. Some choose to continue their education with a one-

year internship, or they may embark upon a three-year post-graduate residency of intense study and focused practice, culminating in earning a Board certificate in their specialty of choice. A few go on to become academics or researchers, and some obtain a Master's degree or a Doctorate of Philosophy as well in a related field to enhance their knowledge. Veterinary Medicine is obviously not a career choice for the irresolute.

What of life outside veterinary training – does it exist? In the past 15 years, veterinary medicine has experienced a major gender shift. For many years, veterinary medicine was primarily a male pursuit. It was thought that the work required of a veterinarian was not suited for women (Slater & Slater, 2000). However, current veterinary classes contain an average of 75% women (AAVMC, 2003). Some of these women intend to be career-women only, foregoing the option of having and raising children, and even choosing to remain single. There are many, though, who do intend to marry and have children – a few have them already. Many of the men in veterinary medicine also plan to create or maintain an intimate relationship and be an involved parent as well. Given the time, energy, and intellectual demands of veterinary training, one wonders how they will juggle and balance all of these life tasks.

The current study was intended to shed light on this question. It investigated two main variables: “perceived stress levels of veterinary students,” and “satisfaction with significant intimate relationship” utilizing McCubbin and Patterson's (1983) Double ABCX Model as a framework. The roles of self-esteem, satisfaction with training program, year of training, and gender as mediating variables upon life satisfaction as an indicator of adaptation were also investigated.

The Double ABCX Model (McCubbin & Patterson, 1983)

Stress and coping of both individuals and families have been an area of interest within the social sciences for some time. In 1949, Reuben Hill proposed the ABCX model of stress, in which “a” was the stressor event, “b” was the crisis-meeting resources available, and “c” was the perception of the event. “x” was the amount of crisis experienced as a result of the interaction of these three variables. Burr (1973) conceptualized crisis as “a continuous variable denoting the amount of disruptiveness, disorganization, or incapacitation” experienced, and it is “characterized by the family's inability to restore stability and the constant pressure to make changes in family structure and patterns of interaction” (McCubbin & Patterson, 1983, p. 11).

Hill defined four types of crises that families experience, including accession (adding a member), dismemberment (the loss of a member), loss of morale and unity, and changed structure and morale. Later researchers suggested that some crises are actually normative – common, expectable, and short-term events that happen to most people or families as they go through their lives. Pearlin and his co-researchers (Menaghan, 1982; Pearlin & Schooler, 1978) found that these normative events were generally considered less stressful than non-normative events. Hill and Joy (1979) suggested that there were critical role transitions, short-term events accompanied by changes in role expectations and rules for interaction within families, which serve as demarcation points for stages in the family life cycle (p. 9). Regardless of the source and level of “normalcy” of the crisis, this model describes why individuals and individual families may perceive the same event in very different ways.

McCubbin and Patterson (1983) expanded upon Hill’s (1949) original model by adding consideration of post-crisis resiliency (Appendix A), based upon studies of war-induced family crises (McCubbin, Boss, Wilson, & Lester, 1980). After “X,” the crisis event, adaptation is influenced by the amount of pile-up of stresses (aA), the family’s adaptive resources (bB), and their ascribed definition and meaning of the process (cC). All of these factors then suggest the outcome achieved through the adaptation of the family (xX). People and families are always growing and changing, and are thus often managing more than one crisis and/ or transition at a time, which can be overwhelming (factor aA). The number and availability of resources (bB) can have a tremendous impact on how people cope with these pile-ups of stressors. Individual resources include finances, education, health, and psychological resources such as self-esteem and an internal locus of control. Family resources include such things as flexibility of structure, level of cohesion, and adaptability. The availability of and ability to obtain social support can make a tremendous difference in how impactful any given crisis or transition is. Being able to define or perceive the stressor as a “challenge to be met” facilitates coping and adaptation (factor cC). “Coping” refers to the strategies, such as avoidance, elimination, assimilation, synergizing, interfacing, and compromising, that families use to adjust and adapt to changes and crises. Some of these strategies are more effective than others, while some work over a short period of time, but are not effective over the long run. Ultimately, coping is “a process of achieving a balance which facilitates organization and unity and promotes individual growth and development” (McCubbin & Patterson, 1983, p. 24; see Appendix A1).

The Double ABCX Model and the Impact of Veterinary Training on the Individual's Perception of Stresses, Resources, Coping Style, and Quality of Life

Though the Double ABCX model was constructed to describe what happens within families facing a crisis of some sort, it also can be easily applied to the “crisis” of veterinary training for the individual trainee. It is important to remember that the model incorporates the passage of time and how the different variables interact across time. Thus, variables “a” (stressor), “b” (resources), and “c” (perception of “a” & “b”) are inherent to the individual student, having happened in the past and helping to comprise who each student is as a person pursuing veterinary training. The Veterinary Training process is the “crisis,” variable “x.” Certainly, when we consider the multiple demands placed upon veterinary trainees, including coursework, testing, clinics, developmental tasks, and relational issues, a pile-up of stress, “aA,” is quite conceivable. Although some veterinary training programs and most college campuses provide access to mental health assistance and there is some form of financial aid available to most students, students need to know about these resources, be comfortable using them, and be able to conveniently access them in order to make use of them (variable “bB”). If the veterinary trainee is involved in a significant intimate relationship, that relationship may be perceived as either a resource (if it is satisfactory) or a stressor (if it is not satisfactory). Perception of stressors and thus the level of “pile-up” experienced, and perception of access to and availability of resources, variable “cC,” varies from individual to individual. This is the primary variable that was measured in this study, utilizing a combination of several different recognized instruments. The individual’s coping ability interacts with all of these variables to determine to what degree he or she is able to adapt to the veterinary training process. Coping ability, in turn, may have a tremendous impact upon the level of adaptation of the student. Adaptation was assessed through a Quality of Life measure. The figure in Appendix A2 draws out the proposed model for how the stresses of veterinary training interact with the individual trainee’s perception of the other stresses they are experiencing, their perception of their available resources, and their coping style, to assess their level of adaptation as measured by their perceived quality of life.

Veterinary Training as a Stressor

What is stress?

Lazarus (1990) described stress as a “multivariate process involving inputs, outputs, and the mediating activities of appraisal and coping” (p. 5). He stated that it is “quite an individual matter” and claimed that it occurs “only when a person has made an evaluation that external or internal demands tax or exceed his or her resources” (Lazarus, 1995, p. 5). Further, he said, “stress is not a property of the person or the environment, but arises when there is a conjunction between a particular kind of environment and a particular kind of person that leads to an appraisal of harm, threat, or challenge to that individual’s well-being” (Lazarus, 1993, p. 26). Thus, he proposed a “cognitive-motivational-relational” theory of stress (and other emotions) that suggested emotions are about the person-environment relationship, reactions to the status of the individual’s goals based on the significance of the goals in question, and the harm or challenge perceived to them. Therefore, their “status changes with changes in the person-environment relationship as it is understood and evaluated (appraised) by the individual experiencing them” (Lazarus, 1993, p. 26).

Lazarus (1993) described six appraisal patterns that the individual uses in determining the degree of stress perceived in any given situation. The three primary (motivational) patterns included goal relevance, which determines what, if anything, is at stake and to what degree (intensity); goal congruence or incongruence, whether the encounter is deemed harmful (negative emotion) or beneficial (positive emotion); and type of ego involvement, the facet of ego-identity to which the individual is committed and is thus effected (self- or social-esteem, moral values, ego ideals, meanings and ideas, persons and their well-being, or life goals). The three secondary patterns assessed options for coping and expectations of what will happen. They included blame and credit, which determines who is accountable and whether they could have controlled their actions; coping potential, whether and in what way we can influence the person-environment relationship; and future expectations, the changes in the person-environment relationship that the individual expects to take place. Lazarus’ description and definition of stress and his patterns of appraisal clearly have relevance to the experience of stress by veterinary medical trainees. Clinically, there are students who report feeling a great deal of stress during the entirety of their training, others who report occasional stress but can pinpoint why they feel that stress, and those

who seemingly sail through their training and express that they enjoy the challenge. An assessment of perceived stress, in combination with an assessment of the other variables of interest, shed some light on why students perceive the veterinary training process so differently.

The Rigors of Veterinary Training: An Overview

As suggested previously, the process of veterinary training can be quite stressful indeed. During their first three years of training, students enroll in a rigorous scientific curriculum that is approximately equivalent to 21 graduate credit hours per semester (CVMBS, 2003). At some point during the transition from their third to fourth year, they will start spending more and more time on clinics, assisting with cases in the hospital in preparation for their final year of training when they are on clinics continuously. When they become seniors, they are expected to remember and apply all the knowledge they have learned over the previous three years. Many students express a great deal of anxiety about this transition. They fear they won't remember everything they've learned, or won't be able to apply it appropriately. The responsibility that goes with choosing the appropriate diagnostic tests, making a correct diagnosis and selecting a fitting course of treatment can feel overwhelming, and the students dread the potential consequences of any mistake. They are, for the first time, largely responsible for their patient's well being and quality of life, responsible to the animal's human companion as a client, and want to prove themselves worthy of trust and admiration from their clients, peers, and supervising clinicians. This experience can be exhilarating and exciting, but it can also be fraught with stress, as the expectations the students perceive and have for themselves are incredibly high (author's clinical experience, 2001-2003).

Developmental Stresses

Although there are some "non-traditional" or "second-career" students, most veterinary students are fairly young. The average age of current veterinary school students in the U.S. and Canada is 24 years (AAVMC, 2003). According to Erikson (1965), these young people are just completing their Identity vs. Role Confusion crisis, and moving into the Intimacy vs. Isolation stage. Erikson saw the resolution of identity, the last stage of adolescence, as "both the gateway to and the cornerstone of adult development, the 'integrator' that moves one toward 'wholeness'" (Hoare, 2002, p. 31). Though finding a long-term mate is generally considered to be a task of early adulthood, the compromise and shift in personal values (that are freshly identified and

affirmed) required to develop a healthy partnership may feel like a threat to independence and individual identity (Wheatley, 2000). Indeed, Erikson expressed concern that “young adults’ immersion in deep intimacy nearly eclipses their considerable work toward vocational identity if it is by then attained” (Hoare, 2002, p. 32). In her dissertation research, Harrington-Hill (1991) found support for Erikson’s theory that “a personal sense of ego identity is a necessary, although probably not sufficient, aspect of a positive, shared relationship with another individual” (p. 2083). Additionally, Marcia (2002) felt that the achievement of identity “at late adolescence gives one a secure sense of self-definition so that one can risk vulnerability and mutuality with another without fear of surrendering or losing oneself” (p. 12). Thus, it can be concluded that, if the young adult’s identity is fairly secure, she or he should be able to go about the process of initiating and maintaining a significant intimate relationship.

So why is it that so many apparently securely “identified” young adults, such as those who pursue veterinary training (a committed career identity), appear to have difficulty with intimate relationships? Perhaps it is because they are not yet maturely intimate persons. Marcia (2002), building upon his research on identity development in 1967, proposed that intimacy can be defined along a continuum of choices, “based on the criteria of depth and commitment in a relationship” (pp. 9-10). He suggested that fully “intimate persons value depth in relationships and are capable of being committed for long periods of time.” Preintimate individuals, though not currently in a relationship, also value depth and long-term commitment. However, those who are in a relationship that has the appearance of intimacy but “lacks intimate substance” are pseudointimate. Slightly different are the stereotyped individuals who “are involved in superficial dating relationships but have no interest in depth or long-term commitment.” Finally, there are those who are isolated, who “eschew relationships altogether, either by choice or necessity” (Marcia, p. 18). Certainly the preintimate, and even the stereotyped, individuals might be expected to become fully intimate if contextual conditions are conducive, but Marcia cautioned that if they experience “disastrous relationship experiences,” it is likely that they will not develop intimate maturity. This begs concern for those veterinary medical trainees who experience regular or extreme difficulty with the development of significant intimate relationships. Will these problems prevent them from having such a relationship in the future, even after they complete their training? On the other hand, the content of any given stage of development will “set up some of the disequilibrating events that threaten identity,” so that for

any young adult, an identity crisis will more likely involve intimacy issues than at other stages of life. Crises are defined as “vulnerable growing points” and derive from issues to which individuals are most susceptible at that point in their lives (Marcia, p. 18). This could mean that the realm of intimacy is merely the stage on which stresses make their appearance at this point in the trainee’s life, with no long-lasting negative effects.

Perhaps we needn’t be concerned about intimacy or identity crises, but there are societal pressures on these young people, especially the women, to consider as well. Though our society claims to have loosened the expectations for young adults to find a mate and start procreating, many young people still report feeling pressure to adhere to these norms (Neugarten, 1979). Wheatley (2000) claimed, “when societal norms are not met, individuals may be put under pressure by family and others to conform and may feel pressure to justify their lifestyle. People have an internal sense of whether they are on time or not with regard to society’s expectations” (p. 331). Thus, the potential for feeling stressed about getting married and starting a family may be present for many veterinary students if they “hear the clock ticking” and have family members or friends who expect them to conform to societal norms.

Conversely, stress may also arise due to the impact of an intimate relationship. As suggested previously, “immersion in deep intimacy nearly eclipses the considerable work toward vocational identity” (Hoare, 2002, p. 32). If the veterinary student has already established an intimate relationship prior to entering the training program, it is certainly possible that problems within that relationship could impact his or her success during the veterinary training process and create additional stress for him or her. Although much of the current literature suggests that there is greater impact on family and marital satisfaction from work stress than vice versa, there is some evidence to suggest that, especially for men, family and marital satisfaction or functioning can impact work as well (Bolger, DeLongis, Kessler, & Wethington, 1989; Leiter & Durup, 1996). Beach et al. (1993) found that marital relationships are both supportive and stressful, and that relationship dissatisfaction is strongly predictive of negative affect, which may impact work satisfaction and/ or performance. Horowitz et al. (1997) went so far as to say that “conflicts with one’s spouse are among the most powerful determinants of distress” (p. 133), and further suggested that “readjustments in social relationships required in early marriage might be more stressful than in longer lasting marriages. It is possible that the problematic side of marriage relationships is more destructive to psychological well-being at the early stage of marriage than

in later years” (p. 133). The emergent issues of young adulthood are those related to intimacy, parenthood, and meeting the expectations of the work environment. Achieving balance among these important areas of life is the major task of this period of development (Neugarten, 1979). The process of striving for this balance is itself a stressful one. It is no wonder that veterinary students express feeling overwhelmed and stressed out – they are.

Veterinary Medical Literature

So how much stress do veterinary medical trainees experience? This is a difficult question to answer, as until recently there has been a paucity of published empirical research on this topic. Phillips-Miller et al. (2000) explored the effects of sex differences in married veterinarians on job satisfaction and work-related stress. They found that female veterinarians perceived more stress from their marriage and family impacting on their career, and less spousal support for their career. The few dissertations that have investigated this topic have shown similar results. Wimberley’s (1991) findings supported those of Phillips-Miller et al.. Melbo (1981) found that the overall level of stress for the majority of veterinary students was in the moderate range, though 14% reported serious to extreme stress. “Academic stress” and “lack of time” caused the most significant amounts of stress for these students. Female students in Melbo’s study reported significantly higher levels of stress. Kent-Arce (1991) developed a measure to assess the stressors experienced by veterinary medical students as they related to the students’ personality traits and selected demographics. Her findings, like Melbo’s, suggest that the major sources of stress for most students are scholastic. The top three were “tests and testing methods,” “inability to absorb all the information,” and “final exams.” The fourth greatest source of stress reported was lack of time – not enough time for family, friends, and social and recreational activities due to the pressures and expectations of their training program. She found no significant differences between genders, ages, marital status, or parental status on the total amount of stress experienced. However, personality traits appeared to interact with some demographic traits to enhance or reduce the amount of stress experienced by individual students. For instance, married students tended to focus more on present concerns than on past or future ones, while students who perceived higher levels of stress were more focused on past or future concerns, were less self-accepting, and were more confused about human nature in general.

The Summer 2005 volume of the *Journal of Veterinary Medical Education* (AAVMC) was dedicated to the topic of veterinary student stress. Eight articles were presented by researchers from Australia and the United States that provide information about stress and its measurement, and suggest interventions that might help veterinary students cope with it. Collins and Foote (2005) surveyed 261 first through third year veterinary students at the University of Sydney about the stresses they experienced within their program and outside the program. The sources of stress most readily identified by these students included unsatisfactory relationships, financial concerns, scholastic concerns and consequent lack of time, and competition. They did not find any significant differences between genders or cohorts. These authors suggested that students might benefit in coping with their stress through being mentored by faculty. They also suggested that faculty have a responsibility to assure that the study workload and their expectations of the students are reasonable, and that they demonstrate understanding and compassionate attitudes toward their students so that students feel more comfortable – and compelled – to seek assistance if they should need it.

Gelberg and Gelberg (2005) reviewed types of stressors, and recommend that stress management programs developed specifically for veterinary students be created and offered. Strand, Zaparanick, and Brace (2005) investigated stress levels in 289 veterinary students from the University of Tennessee College of Veterinary Medicine. Their findings were slightly different than those of Collins and Foote (2005), in that they did not find significant levels of overall stress in their sample, though these students did “report higher levels of subjective stress, time pressure, and depression than the general population” (p. 182). Interestingly, they found a positive correlation between the number of companion animals a student had in their home and the level of stress the student experienced. These authors also reported that female veterinary students reported higher levels of perceived stress than did the men in their sample. Additionally, they reported that fourth year students were “able to engage in more healthy thinking patterns that combated stress” (p. 189), and recommended teaching stress-resiliency skills to veterinary students to prepare them for the inevitable stresses they will face as veterinary professionals.

Kogan, McConnell, and Schoenfeld-Tacher (2005) recommend similar programming to help veterinary students learn coping strategies to deal with the psychological stressors they face. Kogan et al. surveyed 233 veterinary students at Colorado State University regarding their work and volunteer hours, credit card debt, personal relationships, self-care, alcohol use, and their

levels of anxiety, stress, and depression. Nearly half of their respondents reported experiencing some degree of relational difficulty during the past year; almost 15% of these students reported that their relational difficulties had impacted their studies to some degree. These authors further recommended that psychological counseling services be made more readily available to veterinary students. Williams, Arnold, and Mills (2005) also examined levels and sources of stress, as well as coping measures, in 57 veterinary students at Murdoch University in Australia. Their subjects reported moderate levels of stress, and were more likely to utilize adaptive coping methods than not. These researchers found no significant differences between single and relationally committed students, but did find that older students reported more environmental stressors. In addition, they reported that final year students reported more frequent occurrences of all kinds of stressors evaluated in their study. The authors reported on several initiatives that have been implemented at their program to assist students in managing these stresses, including workshops, elective coursework, and formal training in communication skills.

Finally, McLennan and Sutton (2005) utilized veterinary student focus groups from each year of study at the University of Queensland to determine what stresses the students faced, and how they dealt with them. First, third, and fourth year students reported that academic stressors were most problematic, while second and fifth year students blamed lifestyle and financial issues. Most students indicated that they managed their stressors effectively, and expressed willingness to seek assistance from informal support systems such as family, friends, and faculty, but most said they would not utilize counseling services.

Another recent article (Hafen et al., in press) reported on levels of depression and anxiety in 93 first year veterinary students at Kansas State University. Nearly a third of these students were experiencing symptoms of clinical depression, which were predicted by homesickness, physical health issues, and confusion regarding professor expectations. There were no significant differences reported for gender or relationship status for these subjects. The authors recommended interventions such as providing clear expectations, physical fitness and health education opportunities, and support for the development of effective time management and coping strategies.

Graduate Student Literature

Once again, there is a paucity of literature about stress and graduate studies in general. However, Kreger (1995) conducted a study that examined the relationship between stress, self-esteem and depression. He proposed that the longer one has been a graduate student, the less stressed s/he would be due to graduate study. Though Kreger's sample was only 29, his hypothesis was supported. It is therefore possible that perceived stress levels due to veterinary training also may decrease as training proceeds and students adapt to the rigors of the process. Research from veterinary literature does not bear this out, however, as Kent-Arce (1991) reported that third year veterinary students perceived the highest levels of stress, then fourth-years, then first-years, while second year students perceived the least stress.

Human Medical Literature

Given the dearth of literature specifically related to veterinary medical training and the stress it can create, it is necessary to turn to the plethora of literature available regarding the stresses of human medical training. It can be reasonably argued that many of the stresses experienced by veterinary medical trainees would be similar to those of human medical trainees, as the process of training is parallel: two-and-a-half to three years of rigorous scientific curriculum followed by a transition to clinical work that involves increasing personal responsibility for patients and their care (Kansas University Medical Center, 2005, Curriculum, 2). Thus it makes sense to examine the levels of stress experienced by human medical trainees as they go through their program to ascertain what veterinary medical trainees might be experiencing.

Why is it that there is so much literature addressing this topic within the human medical arena, and so little in veterinary medicine? Speculation is the only avenue available, but when pondering this question, it makes sense to consider the focus of these two careers. Veterinary medicine is focused on animals, their health and well-being. Human medicine, likewise, is focused on human health and well-being, and it has long been recognized that psychological stress can have a tremendous impact on human physical health. Additionally – perhaps because of this acknowledgment – within the human medical field there is a specialty that focuses on mental health, psychiatry. Indeed, the authors of many of the articles within this area are either

psychiatrists (or psychiatry trainees) or occupational health specialists. There is at present no corollary within the field of veterinary medicine.

The first known “study” about the mental well-being of medical students and professionals was published by Sir James Paget in the St. Bartholomew’s Hospital Reports in 1869, and in 1902 in a series of Selected Essays and Addresses. Sir Paget and his colleagues reported on what had happened to 1000 of their students, who had attended their lectures between 1839 and 1859, in the fifteen years since those students had entered the training program at St. Bartholomew’s. The three instructors determined somewhat subjectively how many of the thousand students had attained “distinguished success (23),” “considerable success (66),” “fair success (507),” “very limited success (124),” and which had “failed entirely (56),” “left the profession (96)” or “died (128)” (p. 28). Of those who left the profession, Paget, remembering their characters, said, “there appears no reason for believing that they have ‘bettered’ themselves ... the result would have been, I think, the same if they had remained in their first calling” (p. 30). Of the 128 who had died, seven had committed suicide, two while students. However, Paget included a footnote that indicated that the mortality rate for his students was not significantly different than the general mortality rate of the time, and concluded that there is “no reason for considering the medical profession either less or more healthy than other pursuits, at least in its earlier stages” (p. 31). Paget’s ultimate conclusion, after reflection upon his students, was that,

“nothing appears more certain than that the personal character, the very nature, the will, of each student had far greater force in determining his career than any helps or hindrances whatever. ... every student may draw from his daily life a very likely forecast of his life in practice, for it will depend on himself a hundredfold more than on circumstances. The time and the place, the work to be done, and its responsibilities, will change; but the man will be the same, except in so far as he may change himself” (p. 32).

Individual Characteristics and Personality Traits of Medical School Trainees

Indeed there is some more recent research to suggest that personality traits and characteristics of medical school trainees may put them at risk for certain stresses or for experiencing maladaptive stress to a greater degree than the general population might. Thomas

(1976) replicated Paget's study with 1337 Johns Hopkins medical students from the classes of 1948 through 1964. Of this group, nearly 7% did not complete their training, and 49 died prematurely (3.1% of the graduates and 11.2% of the nongraduates), 17 of suicide (p. 185). Thomas concluded that failure in medical school and life in general were correlated, and that psychological stamina was critical in obtaining the goal of becoming a medical doctor. Specifically, she said, "poor self-image, damaged self-esteem and covert depression, anger, and fear take their toll when certain students undergo the pressures of medical school" (p. 195).

Marchand et al. (1985) stated that "many of the psychosocial characteristics of students that lead them to a career in medicine also predispose them to emotional and mental disorders" (p. 246). Indeed, many researchers have found that at least 13% of medical students show evidence of significant psychological distress (Adsett, 1968; Clark & Zeldow, 1988; Davidson, 1978; Firth-Cozens, 1989; Gerstein & Russell, 1990; Kutcher, 1984; Marchand et al., 1985; and Sacks et al., 1980); some studies found evidence of distress in up to 36% of their surveyed population (Firth, 1986; Firth-Cozens, 1989; Firth-Cozens et al., 2000; Wolf, 1994). This compares to a general population prevalence of 11.6 – 18% (Firth-Cozens et al., 2000; Marchand et al., 1985). Thus the prevalence of psychological distress in medical students is anywhere from similar percentages, to twice that of the general population. Clark and Zeldow (1988) found that the median distress score on the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) increased three-fold for their subjects during the first two years of medical school. They also found that individual students remained in similar class ranking for level of depression throughout their schooling.

What are some possible causes for the vulnerability of individual students? Marchand et al. (1985) suggested that specifically, medical students have "limited experience coping with stress," are overachievers, and "have a tendency to deny problems and avoid seeking help" while also possessing a "strong need to care for people" (p. 247). These authors further suggested that "all of these characteristics may be due to or exacerbated by the level of maturity of the student" (p. 247). Gaensbauer and Mizner (1980) said, "it is likely that emotional disturbances derive as much from the nature of the developmental stress being faced by the student as from his or her individual vulnerability" (p. 61). Sacks et al. (1980) suggested that childhood problems and traumas create additional anxiety for trainees when they are faced with patients that remind them of these past experiences. Wolf (1994), quoting Virshup (1981), proposed that several basic

psychological needs important to resolution of identity and development of intimacy (attachment, individuation, self-esteem, ability to cope with criticism, internalized security, and self-expression/ creativity) are severely challenged during the medical school process, thus leaving students vulnerable to additional levels of stress. Notman, Salt, and Nadelson (1984) also suggested that the developmental issues involved with consolidating personal and professional identity, as well as pre-existing personality problems, may produce or increase stress for medical students. They further suggested that, since many medical students are still in the process of separating and individuating from their families of origin, they may be effected by changes and problems within their families as well. Kutcher (1984) proposed that the idealized view of the physician as always strong, all-knowing, and interminably available creates a great deal of stress as medical students strive to live up to this ideal. Indeed, in a recent review of literature on medical student stress, Firth-Cozens (2001b) found that the “main predictors of distress were students’ perfectionism and ‘imposter’ feelings” (p. 6). Whatever their reason for vulnerability, students may desire access to mental health assistance but may not seek it, due to the fear of being labeled negatively (Alexander & Haldane, 1979). Wolf et al. (1991) asserted that it is “essential to enhance both cognitive and psychosocial development during medical education to enhance the well-being of both doctors and patients” (p. 180).

Self-Esteem in Medical Students

Self-esteem is a popular variable in studies of medical students, but there has been little conformity in regard to how it has been measured, or in how the results have been interpreted, and thus how it impacts or is impacted by the medical education process is unclear. As previously stated, Thomas (1976) suggested that self-esteem is damaged by the medical education process. Wolf et al.’s study (1991) supported this suggestion, reporting a decrease in self-esteem across the first year of medical school. Gerstein and Russell (1990) proposed that the destruction of self-esteem through the medical education process prolongs adolescence and causes a loss of self-determination and problem-solving abilities. Bramness, Fixdal, and Vaglum’s (1991) study with Norwegian medical students lends further support, as they found that these students reported significantly lower levels of self-esteem than the general population. They proposed that “general self-esteem is an intervening variable between external stressors and nervous symptoms,” but may be influenced by experiences in medical school as well (p. 340). Schwartz et al. (1978) reported that those students who were dissatisfied with themselves and the

medical profession were more uncertain about their identity, and were thus more vulnerable to stress. Linn and Zeppa (1984) found that students with low self-esteem and an external locus of control were more likely to experience unfavorable stress, which was associated with poor academic performance. They acknowledged, however, that what was perceived as stressful depended upon the individual's personality and coping skills. Merrill, Laux, Thornby, and Vallbona (1989) reported that low self-esteem was highly correlated with depression, and that medical students with low self-esteem "held unfavorable views toward 'difficult' patients and are most likely to feel guilty when patient outcomes are unfavorable. They feel neither in control of their lives nor much desire to be in control" (p. 2066). Furthermore, these authors proposed that this combination of low self-esteem and "maladaptive attitude" (p. 2066) was part of these students' personality. In reply, Clark and Zeldow (1989) agreed that "a personality cluster of self-esteem, locus of control, and self-confidence predicts medical student well-being" (p. 2066). In contrast to the other findings mentioned, it was their contention that medical student self-esteem levels are higher than average in general, and that medical school does little to change this. They commented that perhaps some humbling was appropriate and necessary for these students.

It appears that student levels of self-esteem may impact medical practice as well. Firth-Cozens, Lema, and Firth (1999) reported that students with higher self-esteem levels were more likely to choose specialties perceived to be more stressful (Linn & Zeppa, 1984), while students with high symptoms of distress were more likely to pursue psychiatry (Eron, 1955), and students with low self-esteem were more likely to choose specialties that didn't require much patient contact, such as pathology and pharmacology (Bartnick, Kappelman, Berger, & Sigman, 1985). In their study, Firth-Cozens et al. (1999) found that the most satisfied specialists were surgeons; the least satisfied were male general practitioners and female psychiatrists. Those who reported the highest levels of self-criticism as students were most likely to have become psychiatrists. In another follow-up study of doctors ten years after completing medical school, Firth-Cozens (1997) found that 33% of the general practitioners she surveyed reported stress symptoms. These doctors' current stress levels were highly correlated with their levels of self-criticism as students. It may be that self-esteem is a personality trait resistant to much change over time and circumstance.

Gender's Impact on Medical Students

Another personal factor that may impact the level of stress perceived by an individual during medical training is their gender. In the late 1800s, almost 50% of medical school graduates were female (Wells, 1989). Presently, approximately 36% of medical students are female (Feminist Majority Foundation, 2004). Earlier studies implied that female medical students were more vulnerable to stress than male students. For example, Adsett (1968) reported that female medical students were more likely to seek assistance, particularly in dealing with prejudice and role conflict. Gaensbauer and Mizner (1980) found that female medical students were three to four times more likely to commit suicide than were females in the general population. They also reported that female students suffered more social isolation, had a difficult time with the integration of the expectations of physicians with their socialization as a woman, struggled with “off-time” issues regarding marriage and parenting, and experienced prejudiced and stereotyped treatment from male students. Likewise, the female students in the Bjorksten et al. (1983) study expressed concern about personal safety, discrimination and sexual assault, and self-confidence, and were more easily upset or had their feelings hurt. The same year, Lloyd and Gartrell (1983) also found that women medical students reported more stress, loneliness and lack of time for significant others, and more feelings of inadequacy and low self-esteem. Notman et al. (1984) agreed that women reported more symptoms of distress more frequently, but they also reminded their readers that this didn't necessarily mean that the women were actually experiencing more or greater distress – perhaps it just meant they were more open about it. A few years later, in a study of Israeli medical students, Carmel and Bernstein (1987) found that, although women expressed higher levels of stress for specific stressors, their general stress levels were not higher than men's. Similarly, Firth (1986) found no evidence that women found different types of events to be more stressful. Clark and Zeldow (1988) reported that women medical students were not more vulnerable to depression than men. However, in 1990, Gerstein and Russell reported that women do experience greater levels of stress during medical training. In 1991, Bramness et al. reported that female medical students in Norway had more nervous symptoms, and that by their senior year, their self-esteem was significantly lower than that of their male counterparts.

In a study of female physicians in 1990, Firth-Cozens found that these women, though not more stressed during training, “suddenly” became more stressed upon starting their career.

Forty-six percent of Firth-Cozen's sample scored above the cut-off for depression. Their stress and depression levels were correlated with effects on their personal life, overwork, relationships with senior doctors, and decision-making. Specifically, these female doctors reported difficulties with work-life balance, sexual harassment, lack of female role models, and prejudice from patients and others. Interestingly, the women did not attribute their problems to their career per se, but to their desire to have a family – and many had altered their career path in order to accommodate having a family. Thus, it appears that there is some evidence that women medical students may experience more stress and related emotional difficulty than do their male counterparts. However, it has also been found that women, in general, experience higher rates of depression (10-25% of the population) than do men (5-12% of the population; American Psychological Association (APA), 1994), so it is questionable whether it is medical training per se that is responsible for the findings in these studies.

Ethnicity and its Impact on Medical Students

There have not been many studies that have examined the impact of ethnicity or race on stress levels during medical training. However, Pyskoty et al. (1990) discovered that minority students may have an advantage at entrance, as they appear to have more social support, higher self-esteem, less anxiety, and more internal locus of control. When socioeconomic status was controlled for, it also appeared that minorities do not experience more distress. Unfortunately, it was also discovered that the beginning advantages exhibited by these students disappear rather quickly. After the first year of medical school, the African American subjects had lower self-esteem, higher levels of hostility, and a more external locus of control. The Hispanic subjects maintained a higher self-esteem but they also exhibited a more external locus of control and were more prone to drinking. Thus, though minority students may begin with an advantage, it is quickly lost, which may leave them more vulnerable to the stresses of medical training.

The Training Process and Stress

Though there appears to be a fair amount of evidence that there may indeed be individual vulnerabilities that create stress, it has also been shown that the training process itself may indeed be [unnecessarily] stressful. The stress may not be inherent to medical training per se, but part of professional training in general. There may be stressors specific to medical training, or specific to the year of training that create overwhelming stress for some students. Perhaps some

students are overwhelmed due to poor coping skills and lack of good role models, or because of the professional attitudes, values, and behaviors that are implicitly or explicitly expected. Relationships with colleagues and supervisors may be part of the problem. Each of these possibilities will be examined in the following sections.

Bjorksten et al. (1983) studied students in a variety of health sciences professions (medical, dental, pharmacy, nursing, graduate, and allied health) to determine what stresses the trainees in each curriculum encountered. They found that their subjects experienced the same spectrum of perceived problems regardless of area of study, but that medical students complained more than did the other students. In another study, Heins et al. (1984) compared stress levels of graduate students in chemistry and psychology, and law students, to that of medical students, and discovered that the law students reported the highest levels of stress. In a more recent study, Enns, Cox, Sareen, and Freeman (2001), compared levels of perfectionism in medical students to that of first year arts students. Medical students who exhibited “maladaptive perfectionism (excessive evaluative concerns)” were significantly more likely to exhibit distress symptoms and neuroticism, and were more likely to exhibit depression and hopelessness at the time of the second survey (p. 1034). However, medical students in general were less likely to exhibit maladaptive perfectionism than the arts students. Medical school is a stressful experience, but it may not be as stressful as other professional curricula.

Stresses of Medical Training, Rank-Ordered

There is much consensus regarding primary sources of stress for medical students. Coburn and Jovaisas (1975) reported that, for first year medical students at the University of Toronto, academic factors were viewed as most stressful. This finding was supported by many other studies (Bjorksten et al., 1983; Edwards & Zimet, 1976; Gerstein & Russell, 1990; Heins et al., 1984; Lloyd & Gartrell, 1983; Murphy et al., 1984; Notman et al., 1984; Radcliffe & Lester, 2003). Other stresses related to academic concerns that were found to be stressful included fear of failure (Bjorksten et al., 1983) and making mistakes (Firth-Cozens, 1989; Murphy et al., 1984); classroom interactions (Heins et al., 1984), presenting cases (Firth, 1986), and competition (Notman et al., 1984; Schwartz et al., 1987); and acquiring professional knowledge, skills, and attitudes (Radcliffe & Lester, 2003) and consolidation of professional and personal identity (Notman et al., 1984).

The second most commonly stated set of stressors had to do with patient issues. Off-time death (a young patient who dies) and dealing with death were particularly difficult (Carmel & Bernstein, 1987; Firth, 1986; Firth-Cozens, 1989; Gerstein & Russell, 1990). Patient contact in general (Carmel & Bernstein, 1987), especially that with psychiatric patients (Firth, 1986) was stressful, as was dealing with human suffering (Notman et al., 1984), incurable disease (Carmel & Bernstein, 1987), and large patient loads (Schwartz et al., 1987).

Lack of time was another stressor that was commonly found. Some studies reported that students complained of too little time in general (Bjorksten et al., 1983; Heins et al., 1984; Lloyd & Gartrell, 1983), while some reported that students complained of too little personal freedom (Edwards & Zimet, 1976) or time for personal needs (Bjorksten et al., 1983; Firth, 1986). A similar complaint was conflict between work and fun (Bjorksten et al., 1983) or not enough time for social relationships (Murphy et al., 1984). Related to lack of time were practice demands (Carmel & Bernstein, 1987), overwork (Firth-Cozens, 1989), and lack of sleep (Schwartz et al., 1987).

Other stresses of medical education that were mentioned include dehumanization (Edwards & Zimet, 1976), powerlessness (Bjorksten et al., 1983), and loss of self-esteem (Gerstein & Russell, 1990), lack of support from authorities and/ or problems with supervising clinicians (Firth-Cozens, 1989; Radcliffe & Lester, 2003; Schwartz et al., 1987); and periods of transition (Firth-Cozens, 1989; Radcliffe & Lester, 2003). Heins et al. (1984) reported that students were concerned about economic issues. Financial concerns were ranked sixth of fifteen top concerns of medical students in the Bjorksten et al. (1983) study, and seventh in the Lloyd & Gartrell (1983) study, but were not mentioned as a major concern in other studies.

Stresses by Year

Another way to consider stress in medical training is by looking at the stresses of any given year of training. It does not appear in general that any particular year is consistently more stressful than any of the others. Indeed, there is much disagreement as to which year is most stressful. Each year has its own stressors that can create problems for students. First year students seem to struggle most with academic issues (Adsett, 1968; Edwards & Zimet, 1976; Gaensbauer & Mizner, 1980; Sacks et al., 1980), and several researchers claimed the first year was the most difficult, primarily due to adjustment issues (Adsett, 1968; Carmel & Bernstein, 1987; Wolf et al., 1991). Specifically, first year students struggle with the complexity of the

material, competition, the quantity of material to be learned, and adjusting to the medical school environment (Gaensbauer & Mizner, 1980; Notman et al., 1984). In contrast, several studies determined that the first year was not the most stressful (Mitchell, Matthews, Grandy, & Lupo, 1983; Wolf, Kissling, & Burgess, 1986), though Wolf et al., (1986) did suggest that the pre-clinical years were more stressful than later years.

Clark and Zeldow (1988) claimed that the second year of medical training was the most difficult for their sample, as depression scores were highest during this year. This finding could perhaps be explained by several other findings. Lloyd and Gartrell (1983) found that academic stress was highest for these students. Notman et al. (1984) pointed out that patient contact increases during this year, as does exposure to death (Sacks et al., 1980) and other problems (Gaensbauer & Mizner, 1980). Fatigue is more problematic, and students are more likely to question their commitment to a medical career (Gaensbauer & Mizner, 1980).

Alexander and Haldane (1979) and Bjorksten et al. (1983) were less willing to pin down one year as most difficult, and suggested that both the second and third year were more stressful than either the first or the fourth year of training. However, Lloyd and Gartrell's (1983) findings suggest that the third year was most stressful, at least in terms of sheer numbers of stressors. Patient contact continues to increase (Adsett, 1968; Gaensbauer & Mizner, 1980; Notman et al., 1984; Sacks et al., 1980; Wells, 1989) and lack of time becomes more problematic (Edwards & Zimet, 1976). Students work toward consolidating their identity, face death and other emotional situations first-hand, and take on more responsibility for patient care (Gaensbauer & Mizner, 1980).

Although many of these studies suggested that the fourth and final year of training was generally less stressful for most students, the transition to the clinical nature of this year and the increased responsibility for patients can be problematic for some students (Firth-Cozens, 1989; Notman et al., 1984; Radcliffe & Lester, 2003; Sacks et al., 1980; Schwartz et al., 1987). Although self-esteem may improve as students are treated more like doctors by their supervising clinicians (Adsett, 1968), there are stresses involved with performance and job seeking (Gaensbauer & Mizner, 1980), and the competition involved with finding specialty residency placements (Notman et al., 1984). Lack of time remains a concern (Edwards & Zimet, 1976), as does struggling to find a balance between one's personal and professional lives – a problem throughout medical training (Gaensbauer & Mizner, 1980).

As with the other years, there is conflicting information regarding post-graduate medical training and how stressful it is compared with other years. Gerstein and Russell (1990) suggested that interns were more stressed than they'd been previously, while Firth-Cozens et al. (2000) found this experience to be less stressful as it leant more stability and allowed for more sleep. This could be accounted for by the difference in American versus British training method. McCue (1985) disagreed with this assessment, however, and stated that sleep deprivation was the major stressor of the post-graduate training experience. Perhaps, as Firth-Cozens (1986) points out, every year is stressful and it is the prolonged exposure to stress that is ultimately problematic. Possibly there are other issues about training that create stress that have nothing to do with the year of training per se, such as satisfaction with the training process or relationships with clinical supervisors.

Expectations About the Training Process

In a study of medical school “dropouts,” Gottheil et al. (1969) set out to discover what distinguishes dropouts from those who complete their medical training. They found that dropouts' MCAT scores were as good as the completers' scores, and thus concluded that the problem of dropping out must be tied to “personality and motivational differences” (p. 270). Indeed, they described “lack of fit” between the students' expectations, hopes, and fears, and the pressures and stresses of the medical school environment to be a major source of stress for these students. They also reported that feelings of academic and nonacademic stress are highly correlated, that students who reported experiencing more stress performed less well academically, and that dissatisfied students performed less well and reported more stress. Satisfied students, on the other hand, did better academically and reported less nonacademic stress (Gottheil et al., 1969). Relatedly, Edwards and Zimet (1976) reported that students' thoughts about having chosen the wrong career increased across the four years of medical training. Similarly, Schwartz et al. (1978) also found that students became disillusioned as their training continued, especially with their teachers. They stated, “students in conflict about the doctor role and who haven't arrived at an identity as a doctor are more likely vulnerable to stress and to become dissatisfied” (p. 184). In a review of literature in 1985, Marchand et al. concluded that medical student impairment was due to either “personality characteristics and unmet psychological needs” or to “stresses inherent in the medical education process” (p. 244), such as “dehumanization and isolation”; fears about not being able to remember everything, being

successful, and of “having chosen the wrong profession”; and perceptions of “few rewards, little feedback, and lack of guidance” (p. 246).

The “lack of guidance” mentioned by Marchand et al. (1985) begs the question of clinical supervisor support, a theme that appears in several articles. Firth (1986) found that the strongest negative feelings expressed by her fourth year medical school subjects had to do with their relationships with their supervising clinicians; 34% of them said that these interactions were “highly stressful” (p. 1177). In 1990, Firth-Cozens studied the causes of stress for female doctors as they related to depression. She found that stress and depression were both correlated with relationships with senior colleagues, among other things. In situations where medical school faculty recognized the potential for these problems, students have responded favorably to positive interactions with faculty. Dennis (2000) reported that “the most compelling factor in student adjustment was faculty behavior and attitudes” (p. 55). Specifically, Dennis noted, students appreciated “warm, sincere interest, friendly humor, efforts to learn first names, and other similar caring behaviors and attitudes” (p. 66). They were confused and demoralized by assertions from faculty that the “curriculum would become even more demanding, or that a future life as a physician would afford little leisure time” (Dennis, p. 66). Relatedly, Radcliffe and Lester (2003) reported that “acquiring professional knowledge, skills and attitudes were [one of] the most stressful aspects of medical training,” and that a “perceived lack of support from the medical school authorities also appeared to add to student stress levels” (p. 32). These authors recommended “greater guidance and support from the medical school during crucial transition periods” (p. 32).

The flip side of this argument is that medical students need to learn to cope with and manage stress, as it is true that physicians often face quite stressful circumstances as a matter of course. Thus learning to cope with stress is an important – indeed crucial – part of the medical school process (Alexander & Haldane, 1979; Linn & Zeppa, 1984). McFarland (1980) noted that pre-medical advising is not helpful or realistic to students, and suggested that it needs to help students be flexible and adjust to the demands of medical school more proficiently. Heins et al. (1984) echoed these sentiments, saying “some pressure enhances productivity and learning. The goal is to educate and professionalize bright young people who have chosen to devote their lives to learning and working in a challenging area” (p. 178). Wolf et al. (1991) further asserted that it is “essential to enhance both cognitive and psychosocial development during medical education

to enhance the well-being of both doctors and patients' (p. 180). As the attitudes, values and behaviors learned in medical school are exhibited later in practice (Alexander & Haldane, 1979), it seems important that clinical supervisors make sure they are modeling appropriate and healthy ways of coping with the stresses of a medical career. Otherwise, Wells (1989) warned, "students [and thus doctors] isolate themselves from their patients' affective experiences, at great loss to him and his patient" (p. 235). Kassebaum and Cutler (1998) revealed that it is common for clinical supervisors to use aversive methods such as public belittlement and humiliation in an effort to help students learn, and proposed that these methods are "likely to foster insensitive and punitive behaviors that are adopted and later directed toward patients and colleagues" (p. 1149). In an editorial about stress in medical school, Firth-Cozens (1994a) noted that students who report higher levels of stress also tend to be more empathic. She stated, "empathy is an important element of good care, but expressing it without becoming distressed requires an environment and culture that is supportive and allows space to deal regularly with the emotions that the practice of medicine can create" (p. 436).

Relational Issues and Their Impact on Medical Students

As has been suggested, relationships with clinical supervisors can be a source of added stress for medical students. What of relationships with others, such as classmates, family of origin, and particularly significant others such as spouses? Regarding peers, there is some conflicting information. Edwards and Zimet (1976) stated that few students in their study expressed concern about interpersonal conflict with peers. These authors postulated that perhaps this was because the students were still strangers to each other as they had no time to socialize. Several studies in 1984 (Kutcher; Linn & Zeppa; Notman et al.) reported difficulty in peer relations due to the high levels of competition present in the medical school environment. However, two more recent studies (Lee & Graham, 2001; Paice, Rutter, Wetherell, Winder, & McManus, 2002) have proposed that peers have the potential to be very supportive and helpful in managing the stresses of medical training, and indeed recommended developing programs or opportunities for students to develop these relationships.

Family and Significant Others/ Spouses

One theme that is evident in the literature about medical student stress is the struggle of trying to balance the demands of medical school with those of personal relationships with family

and significant others. Carmel and Bernstein (1987) maintained that none of the four major areas of the medical training stressors they reported were significantly correlated with marital status. Likewise, Katz et al. (2000) claimed that medical student stress was not significantly correlated with spousal stress or marital satisfaction. However, these two studies stand in contrast with a multitude of other studies that found that personal relationships, particularly marital relationships, often suffer over the course of medical training (Adsett, 1968; Bjorksten et al., 1983; Gaensbauer & Mizner, 1980; Marchand et al., 1985; Murphey et al., 1984; Notman et al., 1984; Pyskoty et al., 1990; Wells, 1989; Wolf, 1994). Indeed, a study by Vitaliano et al. (1989) indicated that satisfaction with social supports decreased across the first year of medical training and Bjorksten et al. (1983) found that marital problems increased with each year of study across the four years of training. Coburn and Jovaisas (1975) reported that married students reported higher levels of academic stress but lower levels of social stress. Thus, it appears that marriage may exert a buffering effect against the stresses of medical training in at least some situations, as Bjorksten et al. (1983) and others (Carmel & Bernstein, 1987; Coombs & Fawzy, 1982; Firth-Cozens, 1994b; Katz et al., 2000; Wolf et al., 1991) reported that married students expressed less intensity regarding stress than did their single colleagues. Bjorksten et al. (1983) and others (Coombs & Fawzy, 1982; Tyssen et al., 2000; Tyssen et al., 2001a; Tyssen et al., 2001b; Tyssen & Vaglum, 2002) also reported that single students seemed to experience more distress than did their married colleagues, and that non-married/ cohabitating status was found to be a significant predictor of future mental health problems and suicidal ideation (Tyssen et al., 2001b). To summarize, it appears that, although a few researchers have found no relationship between marital status and stress during medical training, most researchers have found a correlation, though the direction of the correlation is unclear.

Coping

It seems that there cannot be a discussion about stress without a concomitant discussion of coping – and for good reason. Even the daily hassles of life would quickly become overwhelming if humans did not devise ways of managing them. Most of us need not spend much time thinking about how to manage daily stresses as doing so has become automatic. However, what of the stresses, other than daily hassles, that we encounter on a fairly regular basis and the major stresses that most of us encounter at various points in our lives, both as

individuals and as parts of larger systems? What of stresses we choose to encounter, like Veterinary training? These circumstances demand that we appraise the situation and make some effort to deal with it somehow. Sometimes the coping strategy (or strategies) chosen is (are) effective in managing the stressor(s) and we adapt well and move forward. Other times they are not well-managed and we don't adapt well. The Double ABCX model (McCubbin & Patterson, 1983), like Lazarus (1993), promotes coping as a mediating variable that impacts the stressed system's ability to manage the pile-up of all stresses (aA), the resources available to help manage them (bB), and the perceptions of these two sets of variables (cC), to produce an adaptation outcome (xX; see Appendix A1).

The concept of coping was first found in the psychological literature in 1949, in A.H. Maslow's article "The Expressive Component of Behavior." In this article, Maslow contrasted expressive behavior with coping behavior, which he defined as "purposive, motivated, more determined by environmental variables, more often learned, more easily controlled, and designed to cause change in the environment" (p. 261). During the 1950s and early 1960s, coping was found in the psychoanalytical literature in discussions about ego defenses (e.g., Murphy, 1960). Then, in 1966, Richard Lazarus authored the book, *Psychological Stress and the Coping Process*. Lazarus proposed a contextual approach to stress and coping, theorizing that a person's responses to stressful encounters are dependent upon the individual's appraisal of a situation as "personally significant and taxing or exceeding [his] resources" (Folkman & Moskowitz, 2004, p. 747). Lazarus defined coping as "ongoing cognitive and behavioral efforts to manage specific external and internal demands" that are appraised as stressful (1993, p. 237). Since then, Folkman and Moskowitz said, coping has come to be viewed as a "complex, multidimensional process that is sensitive to the environment, its demands and resources, and to personality dimensions that influence the appraisal of stress and the resources available" to manage it (p. 747). In addition, it has been found that, though some specific coping strategies (i.e., escape-avoidance) are consistently associated with poor mental health outcomes, others produce varying outcomes usually dependent upon the characteristics of the encounter appraised by the individual as stressful (Folkman & Moskowitz, p. 747).

In terms of coping effectiveness, Folkman and Moskowitz (2004) argued that no particular coping process should be viewed as inherently good or bad. Instead, they suggest the consideration of appropriate outcomes and the quality of fit between the coping method chosen

and the demands of the stressful situation determine the likely success of coping efforts. Some [chronic] stressors cannot be resolved and, thus, may call for different kinds of coping processes than do acute stressors. Flexibility is an important component to effective coping, as different situations may call for different coping strategies as well. In addition, different people deal with the same stressor in different ways, apply similar coping strategies to different situations (with varying degrees of success) – and the same person may deal with a particular stressor in different ways at different times or across time. An individual’s appraisal of a stressful encounter, and his or her choice of coping strategy at any given moment, is dependent upon multiple factors, including the individual’s culture, past experiences, personality characteristics, resources available, and the context in which the encounter occurs. This is as true, of course, for veterinary trainees as it is for the general population, though it is possible that there are more commonalities among veterinary trainees than there are between veterinary trainees and other groups of the general population.

Coping in Veterinary Medicine

Though there are copious amounts of empirical literature regarding coping, and particularly coping styles, there are few studies about the coping of veterinary students or of veterinarians in general. Brown (1994) administered the Ways of Coping (WOC) short version (Folkman & Lazarus, 1985) to 207 veterinary students and found that there are “stable underlying coping structures across groups within specified coping situations” (p. 313). Her findings supported the findings of other studies utilizing the WOC in terms of the five types of coping methods used: problem solving, seeking emotional support, wishful thinking, detachment, and focusing on positives. However, her first- and third-year veterinary student subjects did not engage in positive focus to the degree found in previous studies of nursing students (Parkes, 1984) and general community members (Folkman & Lazarus, 1980). Brown (1994) suggested that this could be due to the unique stresses present in the veterinary training process, and/ or it could be due to the flexibility that these “bright people” have when faced with stresses (p. 314).

The other two empirical investigations of coping within the veterinary field are dissertations and both, like Brown (1994), focused on coping style, though they each centered on a different aspect of coping style and how it interacts with other variables. Berney (1998) investigated the impact of gender on personality hardiness and coping style among veterinary students. Her findings suggested that there was “no significant gender difference in personality

hardiness” (p. 2997) nor was there any significant difference in hardiness due to age, year in school, marital status, or number of children. However, use of an escape-avoidant coping style was significantly predictive of low hardiness for Berney’s population. Welsch’s (1999) study also examined gender differences in relation to job stress, burnout, job satisfaction, and coping style (utilizing the Coping Styles Questionnaire developed by Roger, Jarvis, & Najarian, 1993) of 457 equine veterinarians. Unlike Berney, Welsch found significant gender differences, with women reporting significantly higher levels of job satisfaction and significantly higher levels of stress and burnout. The women in this study “perceived nearly half of the assessed stressors as significantly more stressful” than did the men (Welsch, p. 5118). Welsch reported that these differences remained even when age, years in profession, years at current job, income, hours worked, marital status, number of children, and life satisfaction levels were controlled. She also found that the women and men in her study coped differently, with males utilizing more problem-focused coping styles and females using more emotion-focused coping styles. In addition, the problem-focused coping styles “neither amplified nor moderated the effect of job stress on burnout” for either gender. However, use of emotion-focused coping style “strengthened the positive association between job stress and burnout in males, but not females” (Welsch, p. 5118).

Because these three studies are so different in focus, it is difficult to draw any firm conclusions about veterinary students’ coping in general, though a more recent study that examined coping in Australian veterinary students (Williams, et al., 2005) found that these students reported moderate levels of stress and were more likely to utilize adaptive coping measures than not. This appears to be the case within the college/ graduate student and general medical literature as well. The studies regarding coping in graduate students (most generally graduate students in psychology) are also mostly focused on coping style and have produced similarly conflicting findings. Gerson’s (1998) dissertation research, like Berney’s (1998), focused on hardiness and she found that students higher in hardiness reported lower levels of stress and used more effective coping skills than those who scored lower in hardiness. Gerson also found that female students scored higher on hardiness than did male students, a finding that contradicts Berney’s findings but is similar to Welsch’s findings. Likewise, Nelson et al. (2001) found that “more successful students were likely to be women” (p. 759), who reported utilizing more emotion-focused coping styles.

Most of the empirical research about coping of medical students has to do with coping styles as well and, again, the results are contradictory. Park and Adler (2003), like Brown (1994), found support for consistency in coping styles across one year's time. They also investigated the impact of coping style on physical health and determined that the use of a combination of both problem-focused and emotion-focused coping styles reduced deterioration of physical health in their subjects across one year's time. Additional support for the consistency of coping style over time was provided by Niemi and Vainiomaeki (1999), as they found that, although most medical students in their study coped relatively well with the stress of training over a two-and-a-half year period, there was a "subgroup with dysfunctional and inadequate coping strategies identified to be at risk for negative development" (p. 125). These dysfunctional and inadequate coping strategies may well be escape-avoidant or confrontive strategies, which were found by Becker (1995) to be associated with distress in the first-year medical student subjects she surveyed for her dissertation research. She also observed that "planful problem-solving coping" was correlated with decreased levels of depression and stress (p. 1706). This research is supportive of Mosley et al.'s (1994) research which found that "coping efforts classified by Engagement strategies were associated with fewer depressive symptoms, while coping efforts classified by Disengagement strategies were associated with higher levels of depressive symptoms" (p. 765).

There were many other studies of coping within the medical literature that explored various aspects of coping method or style among medical students and how various coping styles impact health (e.g., Grossman, Salt, Nadelson, & Notman, 1987), the training process (Spiro, Simpson, & Matteson, 1987), relationships (e.g., Khanna & Khanna, 1990), and other aspects of students' lives. Though findings overlapped, there were no consistent trends other than the finding that certain coping styles may be dysfunctional or inadequate in some situations. It is clear that there are personal differences in coping style, that coping style has a mediating effect on stress, and that effective coping styles can have a positive impact upon the student's quality of life. The focus of this research project is on the individual student's perceived efficiency of coping in general, and how it might positively impact the student's adaptation to the stresses of veterinary training, rather than upon specific coping styles. It was a goal of this study to affirm the importance of coping ability in managing the stresses of veterinary training, and perhaps provide further information about how and under what conditions this may happen.

Having developed a good understanding of stress and coping and of the stresses of medical training in particular, and having speculated about the impact of stress on the significant relationships of veterinary medical trainees – and vice versa, we will now turn to the other major variable of this study, relational satisfaction, to gain an equivalent level of understanding regarding it.

Relational Satisfaction

Relational satisfaction has to do with the degree to which the members of a particular relationship (in this case a committed, intimate relationship) perceive the relationship as providing for them a number of the positive attributes which they desire from a relationship. Terman, Bittenwieser, Ferguson, Johnson, and Wilson (1938) first described the concept of marital satisfaction. Spanier (1976) broadened this concept to relationship satisfaction (Gottman, 1999). As will be discussed in the methodology chapter, there are several facets of relationship satisfaction that impact the general feeling of contentment experienced. Most empirical research regarding relational satisfaction has been done with married couples. Thus, the research reviewed in this section is primarily a summary of the pertinent literature regarding marital satisfaction. As with the stress literature already reviewed, there is very little information about relational or marital satisfaction within the veterinary literature, or within the graduate or professional school literature. Although there is a greater amount of information within the human medical training/profession literature, the findings were rather contradictory and no consistent pattern emerged. The following sections are organized according to the variables that were studied in this research project.

Relationship Satisfaction and Stress

Given that the majority of veterinary students are female (AAVMC, 2003), it is probably fairly safe to assume that, if they are in a relationship, their significant other also works or goes to school as well, since it is still a societal norm in the U.S. for men to be the primary breadwinner for the family (Tichenor, 2005). It is also fairly safe to assume that the majority of significant others of male students might also work, given that, even in the late 1960s, the majority (over 60%) of medical student spouses went to school or worked, often out of financial necessity (Bruhn & duPlessis, 1966; Eagle & Smith, 1968; Perlow & Mullins, 1976), and that the number of women in the work force has increased substantially since 1950. In 2004, 46.6% of

workers were women (9to5, 2005, Women in the Workforce section), and the U.S. Department of Labor (USDOL) reported that in 1998, between 76-77% of women aged 25 – 54 were working (Bureau of Labor Statistics (BLS), 2000, Changes in Women's Labor Force Participation in the 20th Century, p. 2). The USDOL also reports that 58% of married couples reported that both were working (USDOL/ BLS, 2005. p. 2). Thus, these veterinary student pairs can be conceived of as dual-career couples (Houser, Konstam, & Ham, 1990). There are copious amounts of literature about dual-career couples and the stresses they experience. What follows is a sampling and summary of literature pertinent to a study of veterinary student and significant other stress.

Role Strain and Stress Spillover

Two major concepts found within the dual-career literature are role strain, feeling overwhelmed by the multiple roles one is called upon to fill (Derdeyn, 1979), and stress spillover, manifesting the stress experienced in one setting to another (Leiter & Durup, 1996). Veterinary students, who are involved in a committed significant relationship, may well experience both role strain and stress spillover, given the demands of their training. Though the number of hours spent at work was not found to be correlated with marital satisfaction for the 134 medical marriages in Gabbard et al.'s (1987) study, time and strain demands were directly related to work-spouse conflict in Day's (1997) dissertation research, and job satisfaction was found to be significantly negatively related to marital satisfaction by Metz (1991). Derdeyn proposed that doctors have difficulty balancing their personal needs with those of their families and patients and suggested that role strain is a significant stress factor for them. In a three-month study of 151 hospital-based health care workers, Leiter and Durup found evidence of stress spillover from work to family and indicated that work interference with family was related to marital satisfaction, as was emotional exhaustion and personal accomplishment. These researchers also found that stable, supportive marital relationships were actually strengthened by adversity at work. Though predictable structural strains were determinants of stress, these stressful life events were negatively correlated with supportive partner relationship and the balance of support versus problems in the relationship (Horowitz et al., 1997). Karambayya and Reilly (1990) found that those couples with a high level of family involvement and moderately low psychological work involvement of both spouses, had high levels of marital satisfaction and low levels of stress. It seems unlikely, however, that very many doctors or veterinarians would

have “low psychological work involvement,” so it is questionable how generalizable this study is to the medical or veterinary medical professional population.

What might all this mean for veterinary students and their significant intimate relationships? To summarize, though marital satisfaction does not appear to be impacted by the number of hours at work (a good thing for veterinary students, who are likely to spend the majority of their day at the veterinary school or studying), time and strain demands may cause conflict within the relationship or at least internal conflict for the individual as he or she tries to balance the demands experienced from the professional school curriculum with those from the significant relationship. If the student is emotionally exhausted (perhaps more likely for senior and post-graduate students, as they work directly with animals and clients), this effect may be exacerbated. If, on the other hand, he or she feels good about their personal accomplishments (as may be more likely once Board exams are passed, for example), this effect may be diminished. It may be even further diminished if their significant relationship is perceived to be highly supportive and if the balance of support versus problems in the relationship is believed to be reasonable. Indeed, if the significant relationship is perceived to be supportive, problems within the veterinary training program may actually further strengthen the significant relationship. However, if the student is highly satisfied with their training program, his or her relationship satisfaction may be diminished (and vice versa). If, on the other hand, the veterinary students and their significant other are highly involved with their relationship, and not highly psychologically involved with their training program/ work, they may experience a high degree of relationship satisfaction, and low levels of stress.

Mental Health and Relational Satisfaction

Relational satisfaction was often found to be related to mental health and several studies from within the human medical literature considered this association. A common complaint of depressed people is loneliness, the most frequently cited problem for medical student spouses in several studies (Bruhn & duPlessis, 1966; Eagle & Smith, 1968; Perlow & Mullins, 1976). Katz et al. (2000) found that medical student stress was highly correlated with spousal depressive symptoms, though it was not significantly correlated with either spouses’ reported stress levels or degree of marital satisfaction. Katz et al. (1997) suggested that lack of [spousal] support during a crisis, especially if support was anticipated but not received, was related to depressive symptoms. Likewise, Horowitz et al. (1997) reported that conflict with spouse was among the most powerful

determinants of stress. Beach et al. (1993) found that interpersonal stress was more than four times as important as any other variable in accounting for negative affect. Coombs and Fawzy (1982) reported that medical students in unhappy marriages had higher levels of depression than did single medical students, who had higher levels of depression than did happily married students. However, a high degree of emotional support [from significant others] can significantly reduce overall stress (Melbo, 1981). It is interesting to note that, in Coombs and Fawzy's study, single medical students were more stressed than married students and that their stress levels decreased significantly after they married.

Clearly, mental health is related to relationship satisfaction and, furthermore, relationship satisfaction may mediate stress levels. Veterinary students, who are highly stressed by their program, may also have a depressed significant other. Either partner may experience depression if they are facing a crisis, and expected support in managing it, but found the support lacking. Thus, if the veterinary student expected a great deal of support and understanding from his or her partner during the rigors of veterinary training, but perceived him (or her) to be unsupportive, he or she may end up depressed. Conflict between the two partners may increase depression levels. However, if the relationship is satisfactory, the veterinary student will likely be less depressed than his or her single colleagues and, in fact, may feel less stressed as well.

Gender and Relational Satisfaction

Interestingly, women seem to be more affected by relationship issues than men. Specifically, problems in the marital relationship affected depression levels in females to a greater extent, and the balance of support to problems within the relationship had a stronger impact on depression for women, according to Horowitz et al. (1997). Smith et al. (1988) also found an especially high correlation for women between the number of highly stressful life events and their psychological symptoms. Additionally, Melbo (1981) found that married female veterinary students reported higher levels of stress than did single female veterinary students. Similarly, Phillips-Miller et al. (2000) and Wimberley (1991) reported that women veterinarians report a significantly greater effect of marital and family stress on their career and less perceived support for their career. Relatedly, Metz (1991) found that marriage fulfills a supportive function for men in regard to work but not necessarily for women, and Westman and Etzion (1995) found that, though extended family support with regard to work did not impact wives, it negatively impacted husbands.

Since the majority of veterinary students are women and since women appear to be more impacted by relationship issues than men, relational issues may have a tremendous impact upon the stress levels of the majority of veterinary students, increasing the numbers of them suffering from or dealing with depressive symptoms. Female veterinary students may complain of greater interference and perceive less support from their significant others. However, if they do perceive positive support for their efforts from their extended families, they may report less stress overall. Male veterinary students, on the other hand, may be negatively impacted by “support” from extended family members. Thus, relationships with and support from significant others may be key factors in the levels of stress and psychological distress experienced by veterinary students of both genders, but particularly for female veterinary students.

Relationship Satisfaction and Satisfaction with Relationship Status

To briefly summarize, then, it appears that a satisfactory relationship is usually beneficial in managing stress (especially for female students), while an unsatisfactory relationship may exacerbate the stress levels experienced by both partners. When couples are dissatisfied with their relationship, particularly if they feel overwhelmed by the stresses in their lives, they may postpone negotiating about or dealing with conflict, which may further increase dissatisfaction. This may culminate in a crisis within the relationship when a milestone, such as graduation from veterinary school or internship/ residency placement announcement, is achieved (Scheinkman, 1988). Similarly, Rosow and Rose (1972) found in their study of California doctors that divorce often occurred at the height (i.e., most successful era) of a doctor’s career. Berman’s (1979) research also concluded that divorce rates for doctors were highest during their 40s, when most would be busiest with their career. It may be that, during these periods, the doctor seems unavailable to his or her significant others. Certain types of conflict coping methods, such as escape-avoidance, confrontation, or distancing, may further decrease marital satisfaction levels (Houser et al., 1990), potentially leading to divorce. In addition, the discrepancy between expectation and perception of spousal behaviors appears to predict marital satisfaction more strongly than does agreement between spouses about expectations for behavior (Kelley, 1988). Thus, if the significant other of a doctor expects the doctor to be available to the family for a certain number of hours per week or during certain family activities and perceives that the doctor is not available, even though he or she has stated that s/he wants to be, the level of marital satisfaction will likely decrease, again potentially leading to divorce.

On the other hand, Katz et al. (1997) and others (Perlow & Mullins, 1976; Perrone & Worthington, 2001) discovered that satisfaction with problem discussions led to an increase in relationship satisfaction. So, despite the number and severity of problems, if they are discussed (and presumably acted upon), the relationship will be deemed satisfactory. Indeed, Katz et al. (1997) said that marital changes that were positive, “preceded and produced improvement in depression” (p. 261). In this same study, these researchers found that 75% of the marrieds in their study claimed that their spouse is their best friend and 80% said they’d marry the same person over again. Additionally, the marital relationship was the most frequently cited source of support in several studies (Beach et al., 1993; Katz et al., 1997).

So are doctor marriages unsatisfactory? Doherty and Burge (1989) claimed that there is no evidence that doctor marriages are less satisfactory or less stable than that of the general population. In a thorough review of 1970 and 1980 Census data, these researchers discovered that the divorce rate for doctors is actually lower than that of the general population or that of other highly trained professionals. This finding is in direct contrast to Bird’s (1979) report, which indicated that doctor marriages were highly unstable and had a higher divorce rate than that of the general population. Rosow and Rose (1972) concurred with Doherty and Burge, reporting that doctors tend to marry later in life and stay married longer than managers and other professionals (such as lawyers, architects, engineers, and college professors? – article does not say). Indeed, 95% of medical student wives felt that their marital relationship was satisfactory (Eagle & Smith, 1968) and 93% of 21 British medical couples ranked their marital relationship at least a seven out of ten (Johnson, Johnson, & Liese, 1991). It is unknown whether all of these same trends are true for students of veterinary medicine, but this research shed some light on the level of relationship satisfaction among this sample of veterinary students.

Relationship Satisfaction and Personality Characteristics

Perhaps a reason for the apparent success of medical marriage, despite the many stresses inherent in such a relationship, is the personality of those who pursue this kind of career. As previously established, those pursuing a medical career of any kind are success-seekers. Competition for acceptance to training programs, and for internships and residencies, is stiff. Those who are willing to subject themselves to this process, must have a strong sense of self-esteem at least. Yet, some studies suggested that there is a decrease in self-esteem across the training process (Cron, Slocum, Goodnight, & Volk, 2000; see also Bramness et al., 1991;

Gerstein & Russell, 1990; Thomas, 1976; Wolf et al., 1991). How do personality characteristics impact upon relationship satisfaction and vice versa?

Not surprisingly, marital status and marital quality have been found to be strongly related to general subjective well-being (Katz et al., 1997) and marital support has been found to be beneficial for individual well-being (Katz et al., 2000). Though family support did not predict self-esteem levels for the 72 fathers in Sinacore and Akcali's study (2000), these subjects' sense of inner worth was predicted by their family environment. Kelloway and Barling (1994) found that the opposite is true as well – the quality of an individual's well-being predicted marital satisfaction and functioning for their subjects (224 Canadian marrieds; 53% women). Likewise, Hood (1990) reported that maritally satisfied individuals made more stable, controllable, and internal attributions about marital satisfaction than did maritally dissatisfied individuals. Similarly, Melbo (1981) found that an internal locus of control was negatively related to stress levels and Katz et al. (1997) discovered that high self-esteem lowers the probability of depression due to negative life events. Furthermore, Leiter and Durup (1996) reported that personal accomplishment at work predicted marital satisfaction. Interestingly, similar dispositional coping styles (as measured by the COPE Scale developed by Carver, Scheier, & Weintraub, 1989) may increase relationship satisfaction. The more similarly couples believe and report they cope, the more satisfied they are with their relationship, regardless of how effective their coping style is (Ptacek & Dodge, 1995). Coping style also appeared to predict marital satisfaction, life satisfaction, and degree of psychological symptoms in Robinson's dissertation study (1992) of 104 couples.

This is all good and well if all is good and well, but what if it isn't? Derdeyn (1979) suggested that physician self-esteem was fragile and dependent upon achievement. More recently, Katz et al. (1997) reported that the experience of humiliation (and entrapment) was associated with a greater risk of depression among women (Brown, Harris, & Hepworth, 1995). This is significant to medical training, as there are reports (e.g., Kassebaum & Cutler, 1998) that some clinical supervisors use humiliation as a teaching tool, pointing out trainees' mistakes in front of their peers and sometimes in front of patients. It is even more significant in regard to relationships, as over 50% of humiliation events impacting self-esteem involve one's spouse (Christian, O'Leary, & Avery, 1993). Thus, if a veterinary student is humiliated, either during training or by his or her significant other, his or her risk for depression increases significantly,

which may, in turn, increase his or her dissatisfaction with his or her significant relationship, and/ or with his or her training program.

In sum, it is possible that personality characteristics, such as self-esteem, dispositional coping style, and vulnerability to humiliation, may have an impact upon the stress levels that veterinary trainees experience, as well as on their significant relationship satisfaction. Those trainees with high self-esteem may experience lower stress, which may in turn enhance their significant relationship – or the relationship may enhance the trainees’ self-esteem, thus decreasing their experienced stress level. Regardless of whether the trainee’s coping style is effective or not, if it is similar to that of her significant other’s coping style, their relationship may be enhanced. Finally, if the trainee experiences humiliation at school, a positive significant relationship may buffer the stress experienced as a result. However, if the significant other is the source of the humiliation, stress levels may increase significantly for the student, possibly resulting in a higher risk for depressive symptoms as well.

Relationship Satisfaction and Satisfaction with Training

There is no research that considers the impact of relationship satisfaction on satisfaction with veterinary medical training. Within the human medical training literature, Perlow and Mullins (1976) suggested that the clinical years of training were more stressful on marriage than were other periods of training, due to the student’s preoccupation with school pressures, limited finances, the student’s inaccessibility and loneliness. Berman (1979) proposed that the transition that comes with the internship year of human medical training was especially difficult for female students, as it is an extremely intense year, often away from known support systems. Residency, she said, tends to be more stable – though she also stated that this stability can lead to a “review” of life status and satisfaction that may be detrimental to relationships (p. 25). Berman’s perspective is based upon Levinson’s (1978) study of adult male development, which suggested that men evaluated their life structures at the end of every decade of their lives. For many students, residency ends about the time s/he turns 30. This is a time, Berman asserted, when people may question “what they have,” “who they are,” and “where they’re going.” They may also question whether the partner they’ve chosen is the right one. Although this process may not derive directly from perceived satisfaction with the medical training experience, its outcome may have tremendous impact upon perceived relational satisfaction. Given the similarities between

veterinary medical training and human medical training, it could be that veterinary students and their significant others experience similar processes.

Outside of the medical literature, but within the graduate/ professional school realm, the few studies found focus on the ways married students cope with multiple stresses and the resultant impact of their coping methods upon their levels of marital satisfaction. Ellet (1994) reported in her dissertation that, “the rate of divorce for women in graduate school is unusually high, and increases with each successive year spent in school (Houseknecht & Spanier, 1980)” (p. 127). She hypothesized that this has to do with traditional marital sex role traits and attitudes and, indeed, found that there was a positive relationship between marital satisfaction and the perception of more feminine traits in the spouses of those women in their second through fifth year of graduate training. Ellet also found that direct communication about roles was a more effective strategy for change than was indirect communication. In a similar vein, Houser et al. (1990), in their study of 26 couples in which the wife was a college student, found that coping methods utilized in managing stress had a significant impact upon marital satisfaction.

Specifically, escape-avoidant and confrontational coping methods were significantly related to lower levels of marital satisfaction. Schienkman (1988) provided additional support for the idea that certain coping strategies are deleterious to marital satisfaction. Utilizing an organizational/ interactional model to describe graduate student marriages, he suggested that, particularly in asymmetrical marriages (student/ working spouse), a process of disengagement in which the partners postpone and suspend discussions about their marital dissatisfaction typically occurs, which culminates in crisis when the student completes their course of study. Together, these studies supported the importance of encouraging students and their significant others to adopt stress coping methods that will enhance their relationship, rather than damaging it, and thus imply an indirect relationship between satisfaction with training and relational satisfaction. However, there are no studies within this body of literature that suggested or investigated a direct relationship between satisfaction with the educational process and relationship satisfaction levels.

Within the veterinary literature, one dissertation study merits mention here. Along the same lines as the studies mentioned previously in regard to stress coping strategies, Berney’s dissertation research (1998) found that the escape-avoidant coping style was a significant predictor of low hardiness (per Myers-Briggs Type Indicator) in veterinary students. She found

no predictive effect for hardiness due to marital status. Again, this research suggested that all veterinary students, married or not, may benefit from learning effective coping methods for managing the stress they experience during their education. Doing so may help to make their training experience more satisfactory, which may in turn have a positive impact upon their level of satisfaction with their significant intimate relationship – but there was no research within the veterinary, human medical, or educational literature to date that directly correlates these two factors.

Conclusion

This chapter has provided a thorough review of the empirical literature, regarding stress and relationships within the veterinary medical, human medical, and college/ graduate training fields. Without a doubt, we know that veterinary training is stressful. It is not clear what effects what in terms of stress and significant intimate relationships. The major question being investigated in this study, then, is, are relationships negatively affected by veterinary training or do relationships buffer the stresses of veterinary training?

To explore this question, the author proposed the following research design: A series of step-wise regressions was performed, entering the variables in question (perceived stress, relationship satisfaction, satisfaction with training, satisfaction with relationship status, self-esteem, and various demographics) into the equation in different ways to predict Adaptation (as measured by Quality of Life) in order to see which model explains the most variance in the dependent variable (Adaptation/ Quality of Life). Chapter Three provides a detailed explanation of how this process unfolded.

CHAPTER 3 - METHODOLOGY

Interest in this study grew out of the author's experience of providing therapeutic counseling support to veterinary students and their significant others at a College of Veterinary Medicine in the Midwestern United States. The author's interest was further peaked through the experience of working as a faculty member at another veterinary training program in the Western United States. The author noted that, while some students, interns, and residents of these programs appeared to rise optimistically to the challenges presented by their training programs, other students seemed to become increasingly stressed by the process, some to the extent that they had to take a leave of absence or drop out altogether. At the same time, it appeared that many of these students, both those who were successful as well as those who were highly stressed, were also grappling with the challenge of managing a committed intimate relationship. Sometimes it appeared that the relationship issues exacerbated the student's stress, while at other times, the relationship appeared to buffer the stress. Given that these students had all achieved acceptance to a veterinary training program, an indication that all were accustomed to some degree of stress as well as being highly driven individuals, the author wondered what differences in personality, and particularly what differences in regard to intimate relationships, these students exhibited. Administrators at both of these programs had also expressed concern to the author about the number of "break-ups" students in general experienced as they went through the training program, and wondered what they could do to help prevent these break-ups and the stress inherent in them, as they'd noted the negative impact break-ups can have upon student progress. This study was a first attempt to investigate the association between the stresses of veterinary training and intimate relationships.

Design

As indicated in the previous chapters, research on or about veterinarians or veterinary students is in its infancy, particularly in regard to their intimate relationships. There has, however, been extensive research conducted on and about students of human medicine, and even about their intimate relationships. Recognizing the many similarities inherent in the training processes of these two programs, it is assumed that the effects upon their intimate relationships

may be similar as well. Thus, it was decided that a quantitative survey of veterinary trainees based upon the findings from the extensive research findings of human medical trainees would indicate if these assumptions were true, establish norms for veterinary trainees, and provide a solid starting point for further research about the interaction of veterinary training and significant intimate relationships.

Questionnaire

A link to an Internet questionnaire comprised of several well-known Likert-scaled surveys (see Appendix C) was sent to veterinary students, interns, and residents of five veterinary training programs in the United States via the programs' Dean's Offices. This anonymous questionnaire requested the participants to answer the surveys retrospectively in regard to their training experience along the lines described in Chapter Two (i.e., perceived stress and coping, relationship satisfaction, satisfaction with training, self-esteem, and quality of life). Demographic information such as gender, age, year of study, household income, and reason for pursuing veterinary training, was also requested.

Data Collection

The students surveyed all attended accredited veterinary training programs in the United States. It was recognized that concern might arise that the results of this research could lead to comparisons between veterinary training programs. The assumption was that, since all of these programs have achieved the requirements of the accrediting agency, all programs provide adequate training for their students. This researcher had no desire whatsoever to compare veterinary training programs in any way, so extra precautions were taken to assure that both the training program and the individual subject remained anonymous. An e-mail letter explaining the project and requesting assistance was sent to the Deans of five of the veterinary training programs in the United States (see Appendix B). Upon receipt of a positive reply from the Dean, another e-mail containing an embedded link to the survey website was sent to the Dean for him or her to forward to the student body at his or her program.

When the individual student opened the e-mail, they were able to read a brief description of the research and its goals (see Appendix C), and then could click on the link provided within the e-mail to access the survey. The survey took no more than 30 minutes for most students to complete. Their submission of the completed survey constituted their informed consent and

desire to participate (see Appendix C). The answers from each survey were gathered into a report on the website, and the data was exported into an Excel (Microsoft, 2000) spreadsheet. The data was then uploaded into the statistical package, *Statistical Package for the Social Sciences* (SPSS, 2004) for analysis.

Information about how to contact the researcher or her major professor was provided in the e-mail the students received via the Dean, as was information about how to access mental health assistance in their vicinity if they should deem it necessary after completing the survey (see Appendix C). The questions on the survey were fairly benign, and asked nothing of a highly personal nature, so it was not anticipated that this survey would cause any undue stress for any given subject. However, information about accessing mental health care was provided as an extra precaution, as it was certainly possible that thinking about stress and relational issues enough to answer the questions could have increased anxiety to intolerable levels for any given participant.

Access to student population

In veterinary colleges the Dean's Office is responsible for the coordination and well-being of the student body. This administrator has the authority to approve of a survey's being sent to the student body. This administrator also has access to college-wide e-mail distribution lists and could distribute the survey via this communication method.

Achieving the Dean's cooperation and assistance in allowing access to the student body was paramount to success in achieving the goals of this research and capturing the sizeable population data that was necessary. To this end, all 28 veterinary training programs in the United States were invited to participate in this research. The Deans at Oklahoma State University College of Veterinary Medicine, North Carolina State University College of Veterinary Medicine, Texas A&M University College of Veterinary Medicine, the University of Wisconsin-Madison School of Veterinary Medicine, and the University of Georgia College of Veterinary Medicine agreed to allow their students to participate, and thus were presented with an e-mail letter explaining the research in detail, with a link to a copy of the complete survey, information about the KSU IRB approval, and a summary of how this research information could benefit veterinary students and those responsible for veterinary training (see Appendix B). Some Deans expressed concern that the information collected from students would be confidential. This concern was clearly addressed. Deans were assured that this data would not be used to rank or evaluate the training programs in any way. No information was collected about the identity of the

participants' programs. This important point was also made overt in the initial presentation to the Deans (see Appendix B).

An e-mail with a link to a web survey had the potential to reach a large number of subjects effectively in a short amount of time and, since most college students are quite familiar with computers, it was assumed that most would be able to access and complete the survey with minimal problems. Other considerations for utilizing this form of questionnaire included response rate, topic salience, and length of survey.

Response rate

After survey distribution, survey response rate is a primary concern. Survey response rate is measured by calculating the percentage of returned surveys as compared to the number of surveys that were sent. Many factors that influence this rate have been identified. The ability to contact the potential participant with notices and reminders has had a positive effect on survey response (Schaefer & Dillman, 1998; Sheehan, 2001). With this in mind, the Deans were asked to e-mail a personal note to the students, introducing the survey and encouraging participation. Two weeks after the survey was sent, a follow-up e-mail was sent via the Deans reminding potential participants of the upcoming deadline for participation.

Topic salience

Another important factor is topic salience, the association of importance or timeliness of a specific research topic. Researchers have found topic salience to be very important to response rates (Schaefer & Dillman, 1998; Sheehan, 2001). It was believed that the topic of relationship maintenance and stress while in veterinary training would most likely have a high degree of interest for the majority of the population of veterinary students surveyed. Introductory information given to participants clearly described that the survey was about student stress, school performance, and relational satisfaction (see Appendix C). Participants were made aware that their participation in this research could benefit future veterinary students. Participants were reminded of the benefits of participating in the scientific process by completing the survey completely and thoroughly. Participants were also made aware that the survey was voluntary and completely confidential, and that there would be no negative ramifications to anyone who chose not to participate, or who chose to withdraw during the survey process (see Appendix C).

Length of survey

Length of survey is an important consideration as well. Although researchers have not identified an ideal survey length, it is clear that a survey can be too long and have too many questions, especially if participants are not being rewarded or reimbursed for their efforts. In general, when surveys have over sixty questions, the length of the survey may effect response rates because of dropouts (Sheehan, 2001). For this reason, every effort was made to keep the survey instrument as brief as possible, while still providing adequate information to address the issues in question.

Potential challenges of Internet surveys

Early Internet survey researchers faced challenges because of the complexity of older e-mail programs, lack of dependability of the Internet, and low computer skills of the computer user (Dommeyer & Moriarty, 2000; Schaefer & Dillman, 1998). Given the academic setting and average age of the target population, it was believed that this Internet survey would not be plagued by the technical problems of earlier surveyors. In fact, the reverse might have been true. Today's Internet user is barraged by more surveys than ever before (Sheehan, 2001). The uniqueness that the Internet survey once enjoyed is long past. This lack of appeal may have had a negative effect on this data collection method unless some other appealing reason recognized by the participant for participating in this survey was identified.

Web based surveys

Many of the technical problems of asking participants to return an e-mail based text survey can be avoided by providing a link to a secure web site. Problems with e-mail-only surveys are that the participant must reveal their identity to the surveyor, as well as to anyone else in the Internet community who cares to look. E-mail is not private, and without complicated encryption, cannot be made confidential. In addition, e-mail forms are text based and complicated to answer for the participant. Different e-mail software handles in-text editing differently, adding to the confusion (Dommeyer & Moriarty, 2000). Web based surveys can be anonymous, inscription is invisible to the user, and neither the surveyor nor anyone else can tell who entered the data. Web based forms can be programmed with click-boxes and pull down menus, intuitive to any regular computer user. Also, web based surveys allow data to be entered

directly into a database through a web interface. This eliminates problems of data entry and compromised data because of data entry mistakes.

The embedded e-mail link to a survey website guaranteed student privacy and allowed a web based interactive survey to be completed by each participant. Through utilizing the web based interface, the subjects were automatically directed to complete different sub-sections of the survey depending upon previous answers. So, for example, students who indicated they were involved in a committed relationship completed a relationship satisfaction assessment, while single students did not.

Internet based surveys tend to go pretty quickly. All veterinary college students have access to high speed Internet at their colleges. They received the survey almost immediately after the Dean of their program forwarded it. After it was completed, the return time was also nearly instantaneous. Dommeyer and Moriarty (2000) report that the average response time to an e-mail survey is 1.2 to 18.5 days. Other researchers report similar times (Schaefer & Dillman, 1998; Sheehan, 2001). While making exceptions for university holidays, this data indicates that two weeks were a reasonable deadline for response. A reminder e-mail was sent approximately two weeks after the first e-mail, to request that those who had not completed the survey consider doing so. The survey link was available for a total of six weeks' time, to accommodate different notification schedules at the five schools.

After the data was downloaded, checks were run on the data to eliminate or correct any problem data. Once the data was checked it was transferred to the Statistical Package for the Social Sciences (SPSS, 2004), a specialty statistical software program utilized to run the analysis and create reports as described in the Design section.

Instrumentation

Choosing the instruments best suited to this survey was a difficult task. First, selection criteria were developed. The principal variables of concern share a sizeable common literature. Indeed they are some of the most commonly studied variables in the social sciences. As such, there have been several different instruments developed and tested for each of the variables utilized in this study. Utilizing instruments that have already been developed and tested for reliability and validity gives this research continuity with what has already been done and will allow for future studies to expand upon what this research found. When possible and practical, it

was deemed important to utilize the same instrument(s) utilized in previous veterinary research, so as to provide a point of comparison and reference.

A literature search was done for existing, proven instruments that met the variable definitions and showed evidence of high reliability and validity to measure the five variables of stress, marital satisfaction, educational satisfaction, self-esteem, and life satisfaction. It was important that the instruments to assess these variables be as brief as possible as, along with the demographic data collected, the survey had the potential to be quite long. As already discussed, if the survey was too long, participants might drop-out and negatively effect the response rate. As a result of this, it was deemed important that the surveys selected be as brief as possible.

The Internal Review Board (IRB), responsible for the safety and well-being of the research participants, may view an established survey as safer, and thus is more likely to approve such, than a survey that contains elements which have never been tested or previously administered. Another consideration was that of cost. Because of the limited funds available for this research, it was also deemed important that the instrument be available for minimal or no charge. Because the instrument would be replicated in electric format and made available to participants via the Internet, copyright was also an important factor. Thus only those instruments in the public domain or for which permission could be obtained were considered for use.

It was also important that the instruments chosen be up to date and still utilized by other researchers. If the instruments chosen were not in modern use, it was likely that future researchers might not be able to build upon the findings of this study.

In summary, each of the instruments evaluated for this study were considered on the basis of the following eight criteria: 1) The instrument already existed and had been used in previous research, preferably within the field of veterinary medicine or at least within studies of human relationships. 2) The instrument adequately measured the variable as defined by the variable definitions. 3) The instrument had acceptable reliability and validity. 4) The instrument was brief, with as few items as possible. 5) The instrument was available for free or very low cost. 6) The instrument could be used without copyright conflict. 7) The instrument was in modern use. 8) It was preferred that this research utilize the same instruments used in previous studies of veterinary students and/or graduates.

The following is a summary of the instruments chosen to measure the five variables of self-esteem, perceived stress, marital satisfaction, educational satisfaction, and life satisfaction. Each instrument is included in its entirety in Appendix C.

Rosenberg Self-Esteem Survey (RSE; Rosenberg, 1965)

The Rosenberg Self-Esteem Survey consists of ten (10) five-point Likert-scaled items that measure general or global self-esteem. Several of the items are reverse scored. This instrument was chosen for this study because it has been used previously in a large study of veterinary students (Cron et al., 1999), and because it is readily available at no cost. Having been in use extensively for quite some time, this scale's reliability is well-established, with Cronbach alphas ranging from 0.74 (McCarthy & Hoge, 1982) to 0.80 (Shahani, Dipboye, & Phillips, 1990).

The validity of Rosenberg's test has also been well-documented. Indeed, it is often the scale against which other measures of self-esteem have been validated. In terms of construct validity, Rosenberg himself found a significant association ($p < .05$) between his test and self-reports of his subjects, as well as with reports from other observers about his subjects (1965). A few years later, Kaplan and Pokorney (1969) found a significant association ($p > .001$) between the RSE and psychophysiological indicators of anxiety, depressive affect, and utilization of psychiatric and other medical resources. In regard to convergent validity, Silber and Tippett (1965) found reasonably high correlations with the Kelly Repertory Test (Kelly, 1955; $r = .67$), the Heath Self-Image Questionnaire (Heath, 1965; $r = .83$), and with interviewer's ratings of self-esteem ($r = .56$). Crandal (1973) also reported a reasonably high correlation ($r = .60$) with the Coopersmith Self-Esteem Inventory (Coopersmith, 1967). More recently, Hagborg (1993) reported a correlation of 0.76 between the RSE and the Global Self-Worth Scale of the Self-Perception Profile for Adolescents (Harter, 1988).

Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983)

This scale asks the participant to respond to statements regarding feelings and thoughts they experienced during the past month. "The PSS measures the degree to which situations in one's life are appraised as stressful" (Cohen et al., 1983, p. 385). The authors go on to specify that, "PSS items are designed to tap the degree to which respondents found their lives unpredictable, uncontrollable, and overloading" (Cohen, et al., 1983, p. 387). Unlike other

measures of stress, the PSS does not list specific stressors, which allows the subjects to express their individual perception of how stressful their life has been during the period indicated (Hewitt, Flett, & Mosher, 1992). For the purposes of this study, the researcher requested that the subjects consider the experiences they had during their last month of training.

The original PSS is comprised of 14 five-point Likert-scaled items. However, Cohen and Williamson (1988) recommended the use of the PSS10, a slightly shorter version of the scale with ten items. The PSS has been utilized extensively, in eight studies between 1986 and 1991 (Hewitt, et al., 1992) and is considered to be reasonably valid and reliable, with a coefficient alpha reliability of between .75 (Cohen & Williamson) to .88 (Mimura & Griffiths, 2004), and a test-retest correlation of .55 - .85 (Cohen et al., 1983). In addition, this scale measures both stress and general coping, and is correlated significantly with depression scores on the Beck Depression Inventory (Beck, et al., 1979; Hewitt et al.). Cohen, Kessler, and Gordon (1995) deemed the test to be appropriate for all age groups when measuring global stress. Mimura and Griffiths reported that the PSS has been utilized for “evaluating the effects of interventions to reduce stress (Chen, Tseng, Chou & Wang, 2000)” (p. 380) and has also been “used as a reference standard for examining validity of new stress measures (Levenstein, Prantera, Varvo, Scribano, Berto, Luzi, & Andreoli, 1993)” (p. 380).

Kansas Marital Satisfaction Scale (KMS; Schumm, Bollman, & Jurich, 1977/ 2000)

The Kansas Marital Satisfaction Scale consists of three (3) items about which the subject indicates their level of agreement on a five-point Likert scale. Scores on the KMSS are highly correlated ($r = .70 - .83$) with scores on the Dyadic Adjustment Scale (DAS; Spanier, 1976), a much longer but widely used instrument that also measures relational satisfaction (Grover, Paff-Bergen, Russell, & Schumm, 1984). It is also highly correlated ($r = .93$) with the Quality Marriage Index (QMI; Norton, 1983; Calahan, 1997), and shows a strong negative correlation ($r = -.50$) with the Marital Status Inventory (MSI; Crane & Mead, 1980), which measures marital stability, suggesting that the KMS is able to reliably discern between those who desire to remain in their current relationship versus those who don't (Jeong, Bollman, & Schumm, 1992). The KMS is highly valid and reliable, with Cronbach alphas of .89 for men (Schumm, Scanlon, Crow, Green, & Buckler, 1983) and .92 (Grover et al., 1984) to .96 for women (Mitchell, Newell, & Schumm, 1983; Schumm, Anderson, Benigas, McCutchen, Griffin, Morris, & Race, 1985). Calahan reported high interitem consistency ($\alpha = .94$) of the KMS and the QMI. Schumm,

Bollman, & Jurich (1997) found evidence for a gender effect with respect to marital satisfaction, with the women (N = 154) in their sample reporting significantly lower levels of marital satisfaction than the men (N = 97).

For the purposes of this study, this scale was amended slightly to include those who were involved in a committed relationship (per subject discretion), substituting the word “relationship” for “marriage” in item one, “partner” for “husband/ wife” in items two and three, and the phrase “significant other” for “spouse” in item three.

Perceived Quality of Academic Life Scale (Okun, Kardash, Stock, Sandler, & Baumann, 1986)

This 10-question scale is a shorter version of the Feelings About College survey (Andrew & Withey, 1976), which has four (4) additional questions. The subject ranks each item on a scale of one (1, “terrible”) to seven (7, “delighted”), based upon Andrew and Withey’s seven categories. Items for this scale were adapted and modified from other, diverse measures of college adaptation (Okun, Sandler, & Baumann, 1988). The current author had been going to amend the KMS (Schumm et al., 1977/ 2000) to assess the subjects’ satisfaction with their veterinary training program, but the Perceived Academic Quality of Life scale is already in use and appeared to be reasonably reliable in its measure of college students’ perceptions of their academic life. Okun et al. (1986) reported a median internal consistency rating of .83 across four samples (Okun et al., 1988). Staats and Partio (1990) found further evidence for the reliability and validity of the PQALS, reporting a test-retest correlation over ten (10) weeks of .432 ($p < .001$). These researchers also reported that correlations between the PQALS (scored as 1 = “delighted” and 7 = “terrible”) and the Satisfaction With School Scale (SWSS; Staats, 1983) ranged from -.33 ($p < .01$) to -.66 ($p < .001$). Staats and Partio also found correlations between the PQAL and the Satisfaction With Life Scale (Diener et al., 1985) ranging between -.18 (NS) to -.29 ($p < .01$). Though there are no other studies reporting reliability or validity information for the PQAL, this instrument appears to address the issues under consideration in this study with a fair amount of accuracy.

Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985)

The Satisfaction With Life Scale (SWLS; Diener et al., 1985) consists of five (5) statements about which respondents rank their level of agreement on a seven-point Likert-type scale. It has been shown to reliably assess an individual’s global judgment of life satisfaction and

is a cognitive, rather than an affective, assessment (Pavot & Diener, 1993). An initial study of 176 undergraduate introductory psychology students, by the scale developers, revealed a two month test-retest correlation coefficient of .82, and an internal coefficient alpha of .87. A later article (Pavot & Diener, 1993) showed that the test was sensitive to changes in life satisfaction over time, reporting that, over longer periods of time, the test-retest correlation coefficient drops to .54. In a second study of undergraduate introductory psychology students (the original sample plus an additional sample of 163), Diener et al. (1985) compared the scores on the SWLS with those of ten other subjective well-being instruments, as well as with some personality measures, including the Marlowe-Crowne scale of social desirability (Crowne & Marlowe, 1964). The correlation with the Marlowe-Crowne scale was quite low, .02, suggesting that the SWLS did not evoke a social desirability response set (p. 73). Diener et al. (1985) reported that both samples exhibited moderately strong correlations (.47 to .68, and -.32 with Bradburn's (1969) Negative Affect Scale) with nine of the ten other scales. The one scale for which the correlation was low, the Affect Intensity Measure (AIM; Larsen, 1983), is a measure of the intensity of emotional experience, so a high correlation was not necessarily expected. Correlations with personality measures were also desirable, depending upon what the personality scale was measuring. Of interest to this particular study is a .54 correlation with the Rosenberg Self-Esteem scale (Rosenberg, 1965). A later review article reported an even higher correlation with self-esteem, .68, but did not indicate how self-esteem was assessed (Pavot & Diener, 1993). Diener et al. (1985) concluded that "it appears that individuals who are satisfied with their lives are in general well adjusted and free from psychopathology" (p. 73).

A second study by Pavot et al. (1991) provided further support for the reliability and validity of the SWLS, exhibiting high correlations (.81, and up to .75, respectively) with the Life Satisfaction Index-A (LSI-A; Neugarten, Havighurst, and Tobin, 1961) and the Philadelphia Geriatric Center Morale Scale (Lawton, 1975) in a study of 39 elderly community members, as well as a "strong association with daily reported satisfaction" (Pavot et al., p. 158) of 136 college students.

In a 1993 review article, Pavot and Diener provided extensive normative data for the SWLS, listing all the studies in which the SWLS had been utilized (25). This article reported internal consistency coefficients ranging from .79 to .89. The article also reported correlations

with other measures of life satisfaction, such as the Andrews/ Withey D-T Scale (Andrews & Withey, 1976; $r = .52$ to $.68$) and the Fordyce Global Scale (Fordyce, 1978; $r = .35$ to $.82$).

Demographic Information

There were 30 demographic questions on the survey, that requested information about the following information: age, gender, race, religion, year in training, GPA (per subject report), prior education attained, reasons for choosing a veterinary career, sources of stress during training, future plans, funding source for training, current student loan debt, current relationship status and duration, satisfaction with current relationship status, occupation of current significant other and hours per week they work, current annual income, presence and ages of children and how they're cared for, and impact of veterinary training on the current relationship. In addition, several questions were asked about whether a communication skills course is part of the subject's training program, and whether counseling is available to veterinary students through their training program. Not all of these issues were pertinent to the current study, but they were of interest to the researcher, who plans to analyze this data at a later date.

Subjects

The participants in this study were students enrolled in five of the 28 Colleges/ Schools of Veterinary Medicine in the United States (AAVMC, 2004). Veterinary colleges are fairly consistent and structured in the way their teaching programs are arranged. Universally, it takes four years to achieve a degree in Veterinary Medicine, and students move through each of the four years in class groups. It is uncommon for a veterinary student to finish with a different class than the one with which s/he started. Veterinary colleges also train graduate students who do post-graduate specialty work, or are studying for a Masters degree or a Doctorate in Veterinary Medicine or a closely related field. This research project intended to include these post-graduate students in its survey and analysis.

During the 2003-2004 school year, the 28 veterinary colleges in North America had a first year class size of between 60 and 135 students. The average first year class size was 85.5. This compares with a current average class size of 116 for the five programs surveyed for this project. Attrition in veterinary training programs is relatively low. Of the 2,655 first year students in North America in 2003-2004, only 49 dropped out, as compared to 32 second year students, five third year students and six fourth year students (AAVMC, 2004, p. 12). Of the 92

dropouts in graduate classes from 2002 to 2005, 61% dropped out for reasons other than low grades (AAVMC, 2004).

After attrition, there were a grand total of 10,388 students in four-year DVM and VMD programs in the 2003-2004 school year (AAVMC, 2004, p. 6). The total number of students in the five programs surveyed was approximately 1,825. The response rate was 25.5%, as 466 students completed the survey. Interestingly, no interns or residents completed the survey. Why they didn't is unknown. It may be that at most veterinary schools, a different dean is responsible for these graduate students, and that therefore, the survey was not offered to them. It is also possible that they received it, but decided they didn't have time to participate, as interns and residents are typically even busier than undergraduate veterinary students.

Race/ Ethnicity, Gender, and Age

In the 28 United States schools there was a total population of 875 minorities in the 2003-2004 school year. The ethnic breakdown of this population was 188 (2%) African American; 291 (3.1%) Hispanic; 251 (2.7%) Asian; 6 (.06%) Pacific Islander; 69 (.07%) Native American. Seventy (.07%) described themselves as multi-racial or other minority categories. Caucasians (8310) comprise 89% of the veterinary student population. The sample responding to this survey was 92% Caucasian. The student population of North American Veterinary Colleges is predominately female, with 7765 women out of 10238 total students (76%; AAVMC, 2004, p. 7). Females comprised 82% of the responding sample. The average age of the U.S. veterinary student was 24 years in 2004; the average age of the survey population was 26 years.

Previous School Success

U.S. veterinary students are a relatively intelligent group, with an average raw GRE score for students entering veterinary training in 2003 ranged from 462 to 610 for Verbal, 560 to 710 for Quantitative, and 615 to 720 for Analytical scores (AAVMC, 2004, p. 10). Mean average undergraduate GPA for U.S. veterinary trainees is 3.52 on a 4.0 scale (AAVMC, p. 9). The average GPA reported by survey participants was 3.31.

Cost of Training

Veterinary training, like any medical training, is expensive. The U.S. average veterinary student expense for resident-status students in 2003-2004 was \$24,017 per year, while non-

resident students paid \$37,957 per year. This results in large student loan debts for many students. Indeed, 337 (72.37%) of those surveyed indicated that loans were their primary means of funding for their veterinary training. Mean student indebtedness for 2002 veterinary graduates was \$67,775, and median debt was \$70,605 (AAVMC, 2004, p. 17). Of 2186 graduating students, 246 reported no debt, but 213 reported debts of over \$100,000 (AAVMC, p. 18). A cumulative student loan debt of less than \$75,000 was reported by 336 of the 461 surveyed respondents, but 125 reported student loan debt of over \$75,000; 41 of these reported debt of over \$100,000. In 1995, associate (non-practice owner) veterinary graduates earned a mean yearly salary of \$47,543.00. The majority (292, or 62.67%) of those surveyed indicated that they planned to go into private practice after graduating. Future projections predict a decline in the job market and starting salary for new veterinary graduates. (Brown & Silverman, 1999). Thus, there is concern within the field as to how professional veterinarians will pay for their training, as well as concern about justifying the expense to quality potential students if they perceive difficulty with paying for their training expenses and/ or achieving their expected standard of living (Cron et al., 1999).

Having described the population studied and the instrumentation that was utilized to gather the data, the process for analyzing the data will now be explained.

Data Analysis

As previously indicated, subjects completed the survey through a website at Kansas State University. Conglomerated data was collected from this website into an *Excel* (Microsoft, 1999) spreadsheet, and entered into the statistical package, *Statistical Package for the Social Sciences* (SPSS, 2004) for analysis. A four-step process of analysis then ensued. First descriptive statistics (mean, etc.) for all variables were determined. Then correlations between all variables were determined, and a correlation matrix made. Given the number of variables, this matrix was quite large. An abbreviated matrix of significant moderate correlations (above .300) of interest to this particular study is included in Table 4.7. Chi-square tests or t-tests were used to test some of the hypotheses. Finally, several step-wise regression analyses were entered to determine the amount of variance explained by each of the major variables per the hypotheses and to determine which of the models described in Chapter One best explained the association among the variables. Given the assumption of a major criterion variable, adaptation (as determined by the Satisfaction

With Life Scale), and multiple predictor variables that were all believed to be related to the criterion variable, multiple regression analysis was deemed the best statistical analysis to use (Gliner & Morgan, 2000; Snyder & Mangrum, 1996). Several possible models of this interaction process were proposed in Chapter One, but the researcher was unsure about how the predictor variables would interact with each other, and about which predictors were most important to the prediction equation. Multiple regression analyses helped to answer these questions (Snyder & Mangrum, 1996).

CHAPTER 4 - RESULTS

This chapter presents the results and analysis of the data obtained via the web-based survey of veterinary students at five veterinary training programs in the United States. The results will be presented in sections according to the analysis process. First, a basic description of the findings will be offered. This will be followed by information about important correlations found to exist between certain variables. Then information about between-groups comparisons will be presented. The hypotheses presented in Chapter One will be reviewed and addressed. Finally, the results of the step-wise regression will be presented.

Survey Sample

Five of the accredited 28 United States Colleges/ Schools of Veterinary Medicine agreed to participate in this study. Three of these colleges are located in the Midwest, and two are in the Southeast United States. Average class enrollment in all 28 U.S. programs is 85.5 students per year (AAVMC, 2004). The five programs participating in this study have a slightly higher average class enrollment of 116 students per year. Approximately 1825 students were invited to participate in the study. A total of 466 surveys were completed, yielding a return rate of 25.5%. As was predicted, the majority of respondents completed the survey within a day or two of receiving an email from the Dean of their program inviting them to participate and containing the link to the survey. A request to send a reminder with the link was emailed to the Deans at the five programs, prior to the survey's closing date, but this had little impact on the total number of surveys completed.

The mean age of the respondents was 26.4 years, slightly older than the national veterinary student mean age of 24 years (AAVMC, 2004). Women comprised 82% of the respondents, compared to 76% of the U.S. population of veterinary students. Caucasians comprised 92% of those surveyed; this compares with 89% of the total U.S. population of veterinary students. Those who identified themselves as Christian (Catholic, Mainline Protestant or Charismatic Protestant) comprised 48.63% (213 of 438), though 35.39% (155) marked "other." Comments in this section indicated that many of these respondents identified with a specific Christian denomination, though they did not mark one of the Christian choices offered.

Though no Interns or Residents responded to the survey, an almost equal number of students from each year of study completed the survey: 112 (24.2%) each of First and Second year students, 120 (25.9%) Third year students, and 119 (25.7%) Fourth year students. It is not known why no Interns or Residents responded. It could be that they did not feel they had the time to offer or it could be that the Deans did not send them the link. The mean grade point average reported by those participating was 3.31 on a 4.0 scale, slightly lower than the national average of 3.52. Not surprisingly, the majority (385, or 88.3%) of those responding reported having completed a Bachelor's degree, prior to entering Veterinary School. Forty-one (9.4%) had already earned a Master's degree, and five (1.1%) had earned a Doctorate. Another five (1.1%) reported that they'd had some Technical Training or earned a Certificate. At present, applicants to veterinary training programs are not required to have completed a Bachelor's degree prior to entering the training program. Although it is rare that an applicant will be accepted prior to completing their Bachelor's degree, there are a few students every year who are accepted without having completed one, though they generally complete it prior to completing their DVM or VMD (personal communication, W.E. Moore, Ph.D., DVM, 2006).

Descriptive Data

Because there was substantial attrition across responses for the ranking questions, a score for each response was computed by multiplying the number of subjects responding per rank by the number of potential rankings for that particular question (i.e., 184 subjects ranked "felt called to Veterinary Medicine" first for Question 8, and there were nine possible options, so the score, 1656, was determined by multiplying 184 by 9), thus providing an absolute ranking score for each response. The tables summarizing these results reflect these absolute ranking scores for each choice item, as well as the actual number of respondents ranking that particular item. The final column of each table indicates the absolute score and actual number of respondents ranking the choice item as one of their top three choices for that question.

For question eight, respondents were asked to rank order possible reasons for pursuing a career in Veterinary Medicine (see Table 4-1). Response choices were based upon an informal survey of veterinary students, in consultation with veterinary professionals. Though "felt called to Veterinary Medicine" was the first choice of more respondents, "love for animals" was the over all top choice of respondents, with 394 ranking it as one of their top three reasons.

“Opportunity to practice medicine but not on people” was ranked third over all. Though “financial or lifestyle incentives” received a higher absolute score, “science or research opportunities” was more frequently ranked as a top three choice. “Prestige” was ranked sixth, “opportunity to practice medicine with the euthanasia option” was ranked seventh, and “family legacy or expectation” was ranked eighth over all by the respondents.

Table 4.1: Question 8: Reasons to Pursue a Career in Veterinary Medicine (per ranking)

Option*/Rank	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	Sum	# in Top 3
Love for animals	1530	1288	441	192	65	20	21	8	4	3569	3259
N =	170	161	63	32	13	5	7	4	4	459	394
Felt called to Vet Med	1656	896	455	186	115	60	24	18	5	3415	3007
N =	184	112	65	31	23	15	8	9	5	452	361
Opportunity to practice medicine not on people	621	736	861	330	175	100	60	34	7	2924	2218
N =	69	92	123	55	35	25	20	17	7	443	284
Science or Research	99	160	357	480	305	256	210	94	20	1981	616
N =	11	20	51	80	61	64	70	47	20	424	82
Financial incentives	63	192	322	432	465	296	201	74	12	2057	577
N =	7	24	46	72	93	74	67	37	12	432	77
Prestige	63	72	280	354	445	448	168	70	14	1914	415
N =	7	9	40	59	89	112	56	35	14	421	56
Opportunity to practice med w/ euthanasia	63	128	189	300	205	188	204	168	73	1518	380
N =	7	16	27	50	41	47	68	84	73	413	50
Family expectation	45	120	91	174	180	180	189	200	106	1285	256
N =	5	15	13	29	36	45	63	100	106	412	33
Other	153	48	147	120	140	88	132	120	135	1083	348
N =	17	6	21	20	28	22	44	60	135	353	44

* Options are listed in order of popular choice

Respondents were also asked to rank possible sources of stress during veterinary training (see Table 4-2). “Grades and personal performance” was ranked first of ten options by 200 of the respondents. “Time constraints” was ranked second, “relationships with significant others” was ranked third, and “finances” was ranked fourth over all. “Expectations of faculty or others” received a higher absolute ranking score, but “competition among students” was ranked in the top three more frequently. “Relationships with colleagues” was ranked seventh. “Relationships with faculty” received a higher absolute score, but “witnessing patient pain or death” was more

frequently ranked in the top three. “Child care” was ranked tenth by the respondents but this is not surprising as only 28 of the respondents indicated that they had children.

Table 4.2: Quesiton 9: Sources of Stress During Veterinary Training (per ranking)

Option*/Rank	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th	Sum	# in Top 3
Grades	2000	783	600	378	108	55	28	12	0	0	3964	3383
N =	200	87	75	54	18	11	7	4	0	0	456	362
Time constraints	1220	1287	624	273	204	80	36	18	12	1	3755	3131
N =	122	143	78	39	34	16	9	6	6	1	454	343
Finances	630	711	680	623	234	125	88	69	34	2	3196	2021
N =	63	79	85	89	39	25	22	23	17	2	444	227
Rels with significant others	570	621	576	406	306	190	136	93	54	1	2953	1767
N =	57	69	72	58	51	38	34	31	27	1	438	198
Competition among students	70	261	336	357	324	270	236	141	132	7	2134	667
N =	7	29	42	51	54	54	59	47	66	7	416	78
Expectations of faculty	70	216	328	448	480	390	208	129	40	0	2309	614
N =	7	24	41	64	80	78	52	43	20	0	409	72
Relationships with colleagues	20	90	208	287	534	480	312	150	36	0	2117	318
N =	2	10	26	41	89	96	78	50	18	0	410	38
Relationships with faculty	10	27	88	147	186	285	380	348	116	4	1591	125
N =	1	3	11	21	31	57	95	116	58	4	397	15
Witnessing patient pain or death	40	72	120	161	234	190	168	189	292	8	1474	232
N =	4	8	15	23	39	38	42	63	146	8	386	27
Child care	120	45	40	21	6	5	4	12	24	184	461	205
N =	12	5	5	3	1	1	1	4	12	184	228	22

* Options are listed in order of popular choice

Eight possible future plans after training were also ranked by the respondents (see Table 4-3). Private practice was the resounding first choice of the respondents. “Training for specialty” was ranked second and “large hospital or institution” was ranked third. “Public service” came in fourth, and “academics”, fifth, while “industry” came in sixth and “research” was ranked seventh over all.

Table 4.3: Question 10: Future Plans After Veterinary Training is Complete

Option*/Rank	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	Sum	# in Top 3
Private Practice	2336	427	228	105	44	18	18	8	3184	2991
N =	292	61	38	21	11	6	9	8	446	391
Training for Specialty	792	763	534	255	72	60	40	4	2520	2089
N =	99	109	89	51	18	20	20	4	410	297
Large Hospital/ Institution	184	854	606	265	160	72	40	11	2192	1644
N =	23	122	101	53	40	24	20	11	394	246
Public Service	232	266	216	280	264	231	112	21	1622	714
N =	29	38	36	56	66	77	56	21	379	103
Academics	88	196	318	430	264	171	112	23	1602	602
N =	11	28	53	86	66	57	56	23	380	92
Industry	56	133	216	240	260	252	154	35	1346	405
N =	7	19	36	48	65	84	77	35	371	62
Research	48	126	144	205	272	207	176	61	1239	318
N =	6	18	24	41	68	69	88	61	375	48
Other	72	196	120	115	120	66	54	171	914	388
N =	9	28	20	23	30	22	27	171	330	57

* Options are listed in order of popular choice

Finally, respondents were asked to rank seven possible funding sources for their veterinary training (see Table 4-4). Not surprisingly, the majority of the respondents ranked “loans” first. “Scholarship” was ranked second by 23.61% (110) of respondents and 21.89% (102) ranked this choice third. “Spouse/ partner” was ranked second, “job” was ranked third, and “Family of origin” was fourth. “Savings” was ranked fifth, “spouse/ partner” sixth, and “assistantship” seventh over all.

Table 4.4: Question 11: Funding Sources for Veterinary Training

Option*/Rank	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	Sum	# in Top 3
Loans	2359	216	80	60	21	16	13	2765	2655
N =	337	36	16	15	7	8	13	432	389
Scholarship	112	660	510	232	120	44	14	1692	1282
N =	16	110	102	58	40	22	14	362	228
Job	28	510	520	360	183	38	4	1643	1058
N =	4	85	104	90	61	19	4	367	193
Family of Origin	532	348	275	224	111	78	20	1588	1155
N =	76	58	55	56	37	39	20	341	189
Savings	140	396	335	248	204	72	11	1406	871
N =	20	66	67	62	68	36	11	330	153
Spouse/ Partner	49	420	185	148	75	90	92	1059	654
N =	7	70	37	37	25	45	92	313	114
Assistantship	28	18	20	68	123	168	95	520	66
N =	4	3	4	17	41	84	95	248	11

* Options are listed in order of popular choice

Total student loan debt for all of their schooling of under \$25,000 was reported by 26.82% (125) of the respondents. Total debt of \$25,000 to \$50,000 was reported by 22.53% (105), 22.75% (106) reported debt of \$50,000 to \$75,000, 18% (84) reported debt of \$75,000 to \$100,000, and 5.6% (26) reported debt of \$100,000 to \$125,000. A total debt of over \$125,000 was reported by 3.2% (15) respondents. Not surprisingly, debt load increased per year of study, with fourth year students (N = 112) being significantly more likely to have a higher level of debt ($t = 6.715$, $df = 148.358$, $p < .001$).

Respondents were also asked about their current relationship status. Married students comprised 31.55% (147) of the sample, 26.82% (125) reported they were dating one person seriously, and 15.45% (72) said they were cohabitating and committed to that person, yielding a total of 73.82% (344) reporting that they were involved in a committed relationship. Those choosing not to date while pursuing veterinary training comprised 3.5% (14) of the respondents, 10.1% (40) indicated that they were casually dating, and 2% (eight) said they were divorced. None reported being widowed. Thus 13.3% (62) indicated they were not committed. Fifteen respondents marked more than one response (e.g., “divorced” and “casually dating”) while 69 respondents chose not to address this question. Responses were collapsed into a single “committed” variable with a “yes” or “no” response; those who had marked two answers were

grouped according to the most current response (e.g., if they'd marked both "divorced" and "seriously dating" they were coded as being committed). Thus, 84.4% (N = 336) of the respondents were coded as "committed" and 15.6% (N = 62) were coded as "not committed.

Respondents were also asked to indicate the duration of their current relationship status. Of the 426 who responded to this question, 30.98% (132) reported a relationship duration of more than five years, while 21.83% (93) reported a duration of less than six months. The other options – six months to one year, one to two years, two to three years, and four to five years – were fairly evenly reported by the remainder of those responding (40 did not respond). In addition, respondents were asked if they were satisfied with their current relationship status. Those indicating that they were satisfied comprised 71.56% (317) of the 443 who responded to this question, while 28.44% (126) said they were not ($\chi^2 = 82.35$, $df = 1$, $p < .001$, when 50% were expected to be satisfied and not satisfied). In a related vein, respondents were also asked if any break-up in a significant relationship over the past five years might have been due to their veterinary training or preparation for it. Though the most frequent answer to the question was "not applicable" (48.48%, or 191 of the 394 who responded to this question), 31.22% (123) answered "yes," and 11.16% (80) answered "no." This indicated that a sizeable minority of the students who had experienced a relationship breakup attributed their veterinary training as a contributing cause in that breakup.

Those who were in committed relationships were asked some questions about their partner. Specifically, they were asked about their partner's occupation. Of the 327 who responded to this question, "professional" was indicated by 15.02% (70), 11.16% (52) said their partner was a graduate or professional student in a field other than veterinary medicine, and 5.79% (27) indicated that their partner was another veterinary student or professional. "Other" was the response given by 21.71% (71) of the respondents. Respondents were also asked how many hours per week their partner worked. "Full-time" was the most common answer, with 28.11% (131 of those responding). Just over 20% (67) indicated their partner worked 30 to 40 hours per week, while 14.5% (47) said their partner worked 50 to 60 hours per week, and 5.5% (18) said their partner worked more than 60 hours per week. On the other hand, 15.38% (50) indicated that their partner worked less than 30 hours per week, and 3.7% (12) said their partner did not work outside the home.

Respondents were also asked about their current yearly household income. An income of less than \$15,000 was reported by per year 55.93% (250) of the 447 respondents. A yearly income between \$15,000 and \$30,000 was reported by 15.4% (69), while 11.6% (52) reported a yearly income between \$30,000 and \$45,000, 8.9% (40) reported an annual income of \$45,000 to \$60,000, and 8.1% (36) reported an annual household income of over \$60,000. Respondents were not asked to indicate how much, if any, of that income was due to loans, so it is not known how the loan debt, reported previously, factors into these reports.

As previously indicated, very few of the respondents indicated that they had children (only 28 of the 453 responding, or 6.18%). Several (4) of the respondents indicated that they were currently pregnant with their first child, and five (5) said that they had stepchildren. Those who had children were asked to report the children's ages; most were very young, under five years of age. Another ranking question attempted to discern how children were cared for while the parents were away at school or work. Of those who responded, most (13) said their children went to a day care center, though some also indicated that they share care with the child's other parent (this response was ranked as one of the top three choices for 16 respondents) or that another family member cares for the child (19 ranked this option as one of their top four choices).

As a former instructor of communication skills in a veterinary training program, the investigator was also interested in whether the respondents' programs offered any communication skills training and in the impact this training has had upon them and their relationships. Of the 453 who responded to the inquiry about curriculum, 53.86% (244) indicated that no communication skills training was offered through their program, and 46.14% (209) indicated it was. Respondents were also asked if they were required to take any communication skills training for their curriculum. Though 56.44% (263) of those surveyed did not respond to this question, of those who did, 30.9% (144) said "no." Finally, students were asked how many hours of communication skills training they'd had (through their veterinary training program or elsewhere). Of 441 responding, 75.97% (354) indicated that they'd had less than ten (10) hours of this type of training.

The last set of descriptive questions on the survey had to do with what impact veterinary training has had upon respondents' significant relationships and what counseling services were offered to students and significant others through their training programs. In regard to the impact

of veterinary training on significant relationships, 49% (215) respondents indicated that there was no impact, or that the training's demands had not been a problem for their relationship. On the other hand, 46.12% (202) indicated that the training program had caused significant problems for their relationship or that a relationship had ended due to the training process ($\chi^2 = 115.64$, $df = 1$, $p < .001$). Twenty-one respondents indicated that they had chosen not to engage in any significant relationships while they were in the program.

Regarding counseling, respondents were asked if counseling was offered through their program (some veterinary programs provide an on-site counselor who works with students specifically). Of the 440 who responded to this question, 45.23% (199) said "yes," 39.55% (174) said they "didn't know," and 15.23% (67) said "no." Several students, who indicated in their comments that they knew their university offered a counseling service for students also said that it was difficult for veterinary students to access these services as these services were often in a different location (across campus) and were not available during hours when veterinary students could access them. One of the programs that participated indicated that they'd recently hired an on-site licensed mental health professional specifically for this reason but that this service was relatively new to the program, so some students may not have been aware of it or known how to access it.

Along the same vein, students were also asked if counseling services were available to their significant others. Of 440 respondents, 65.91% (290) said they "didn't know" and 25.68% (113) said "no." Asked if they would utilize (or had utilized) counseling services if they were available, 37.64% responding (163 of 433) said "no," 36.49% (158) said "yes," and 25.87% (112) said they "didn't know." A final ranking question asked respondents to indicate the reasons why they had or would seek counseling (Table 4-5). "Stress management" was ranked first, "anxiety" second, "depression" third, and "significant relationship issues" fourth. "Personal grief" was ranked fifth, "collegial relationship issues" sixth, and "loss of own pet" ranked seventh over all. "Grief over loss of patients" had a higher absolute ranking score, but "suicidality" was ranked in the top three by the same number of respondents.

Table 4.5: Question 30: Reasons to Utilize Counseling Services

Option*/Rank	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th	Total**	# in Top 3
Stress Mngt N =	1160 116	657 73	512 64	252 36	150 25	60 12	40 10	21 7	4 2	0 0	2856 345	2329 253
Anxiety N =	810 81	864 96	408 51	266 38	138 23	80 16	40 10	36 12	12 6	1 1	2655 334	2082 228
Depression N =	560 56	549 61	504 63	280 40	150 25	105 21	88 22	51 17	20 10	0 0	2307 315	1613 180
Significant Rel N =	400 40	324 36	472 59	364 52	234 39	145 29	116 29	48 16	18 9	1 1	2122 310	1196 135
Personal Grief N =	370 37	279 31	232 29	329 47	282 47	230 46	120 30	42 14	14 7	2 2	1900 290	881 97
Collegial Rels N =	70 7	153 17	224 28	238 34	276 46	195 39	148 37	135 45	40 20	5 5	1484 278	447 52
Loss of Own Pet N =	110 11	198 22	160 20	154 22	168 28	190 38	184 46	72 24	10 5	23 23	1269 239	468 53
Patient Loss N =	50 5	45 5	88 11	147 21	126 21	180 36	212 53	180 60	68 34	8 8	1104 254	183 21
Suicidality N =	80 8	63 7	48 6	91 13	54 9	50 10	32 8	30 10	130 65	98 98	676 234	191 21
Other N =	60 6	36 4	56 7	70 10	102 17	60 12	28 7	57 19	114 57	97 97	680 236	152 17

* Options are listed in order of popular choice

Standardized Instruments

Five standardized instruments were presented to the survey participants as part of this research. The mean score, standard deviation, range, Cronbach's alpha, and number of subjects participating are recorded for each instrument in Table 4-6. The Perceived Stress Scale – 10 (PSS-10; Cohen, Kamarck, & Mermelstein, 1983) was completed by 425 respondents. Scores ranged from 11 to 50 points out of 50 possible, with a mean score of 29.19 (sd = 6.98). The Cronbach alpha for the PSS in this study was .886, similar to the .88 reported by Mimura and Griffiths (2004). The Rosenberg Self-Esteem Scale (Rosenberg, 1965) was completed by 422 respondents. Scores for this scale ranged from 10 to 40 points out of 40 possible with a mean of 30.66 (sd = 5.93). The Cronbach alpha for the RSE in this study was .915, which is higher than the previously reported range of 0.74 (McCarthy & Hoge, 1982) to 0.80 (Shahani et al., 1990).

The Perceived Quality of Academic Life Scale (Okun et al., 1986) was completed by 422 respondents. Scores for this instrument ranged from seven (7) to 30 of 30 possible with a mean of 22.39 (sd = 4.23). The Cronbach alpha for the PQALS in this study was .866, similar to the previous report of .83 reported by the author (Okun et al., 1988). The Kansas Marital Satisfaction survey (Schumm et al., 1977/ 2000) was completed by 302 respondents. Scores for this instrument ranged from three (3) to 15 out of 15 possible, with a mean of 12.6 (sd = 2.67). The Cronbach alpha for the KMS in this study was .932, slightly higher than has been previously reported for men (Schumm et al., 1983), and similar to slightly lower than has been previously reported for women (Grover et al., 1984; Mitchell et al., 1983, and others). Finally, 417 respondents completed the Satisfaction With Life Scale (Diener et al., 1985). Scores for this instrument ranged from five (5) to 35 out of 35 possible, with a mean of 23.93 (sd = 7.11). The Cronbach alpha for the SWLS in this study was .905, higher than the .87 reported previously (Pavot & Diener, 1993).

Table 4.6: Descriptive Information for Instruments Used

Instrument	Mean	Standard Deviation	Range	Cronbach's Alpha	Number of Subjects
<i>PSS-10</i> (10 items)	29.19 (50 pts.)	6.98	39 (11 – 50)	.886	425/ 466 (91.2%)
<i>RSE</i> (10 items)	30.66 (40 pts.)	5.93	30 (10 – 40)	.915	422/ 466 (90.56%)
<i>PQALS</i> (6 items)	22.39 (30 pts.)	4.23	23 (7 – 30)	.866	422/ 466 (90.56%)
<i>KMS</i> (3 items)	12.6 (15 pts.)	2.67	12 (3 – 15)	.932	302/ 336* (89.88%)
<i>SWLS</i> (5 items)	23.93 (35 pts.)	7.11	30 (5 – 35)	.905	417/ 466 (89.48%)

* 336 people indicated that they were in a committed relationship, and were thus able to take the KMS. Those who were not in a committed relationship did not take the KMS.

Significant Correlations Between Variables

A correlation matrix was run between all variables in the study. There were multiple significant correlations reported, though most were not very strong. Many of these correlations were expected (such as that between age and prior education attained, $r = .306$, $p < .001$), and some were not of importance to this particular study (such as pursuing veterinary training because of an interest in science or research and plans to go into private practice, $r = -.323$, $p < .001$).

Correlations of specific interest to this research project based upon the review of literature and ultimate testing of the model that were moderate to strong and significant ($r =$ or $>.299$ and $p < .05$) are reported in Table 4-7. Funding for veterinary training by spouse/ partner (Question 11, choice 7) was positively correlated with committed relationship status (Question 13; $r = .317$, $p < .001$). Funding for veterinary training by spouse/ partner was correlated with a relationship duration of over five years (Question 14) such that funding by spouse/ partner was more likely the longer the relationship endured ($r = -.552$, $p < .001$). Funding for veterinary training by spouse/ partner was negatively correlated with having had a relationship dissolve within the past five years (Question 16; $r = -.342$, $p < .001$). In addition, funding for veterinary training by spouse/ partner was correlated with increasing household income (Question 19) such that spousal/ partner funding was more likely with a higher annual income ($r = -.550$, $p < .001$).

Table 4.7: Abbreviated Correlation Matrix of Moderate to Strong and Significant Correlations

	Q 11.7	Q13	Q14	Q15	Q16	Q19	Q26	PSS	RSE	PQALS	KMS	SWLS
Q11.7 N	1.00											
Q13 N	.317** 276	1.00										
Q14 N	-.472** 304	-.321** 382	1.00									
Q15 N	.254** 306	.234** 382	-.207** 438	1.00								
Q16 N	-.342** 264	-.398** 333	.381** 388	-.276** 384	1.00							
Q19 N	-.550** 305	-.257** 381	.317** 439	-.184** 437	.279** 389	1.00						
Q26 N	.242** 298	.405** 374	-.191** 429	.268** 426	-.443** 377	-.190** 431	1.00					
PSS N	.098 294	.049 362	-.022 417	.259** 415	-.162** 368	-.077 421	.300** 421	1.00				
RSE N	-.036 293	-.074 360	-.017 414	-.219** 414	.136** 365	.029 418	-.227** 417	-.651** 421	1.00			
PQALS N	-.037 293	-.059 360	.076 414	-.087 414	.102 365	-.100* 418	-.169** 417	-.430** 421	.478** 422	1.00		
KMS N	-.118 231	a 302	.003 302	-.660** 302	.267** 254	.120* 299	-.413** 301	-.408** 301	.350** 302	.248** 302	1.00	
SWLS N	-.096 293	-.157** 356	.082 409	-.368** 409	.291** 360	.098* 413	-.299** 412	-.624** 416	.611** 417	.516** 417	.508** 301	1.00

* p = .05; ** p = .001

a. Cannot be computed because Q13 was coded as 1 = Yes and 2 = No.

Explanation of Headings for Table 4-7

Q11.7: Funding for veterinary training. Subjects were instructed to rank-order seven possible funding providers according to which provided the most (1) to least funding. Item seven was “Spouse/ Partner.”

Q13: What is your current relationship status? Choices included “I choose not to date while pursuing my veterinary training,” “Casually dating, but not looking for a serious relationship,” “Single, but looking for a single relationship,” “Single but seriously dating another person,” “Cohabiting and committed to this person as my partner,” “Married,” “Separated,” “Divorced,” and “Widowed.” These items were collapsed into a new variable, “Committed,” which was divided into two categories, “yes” (including single but seriously dating, cohabitating, and married) and “no” (including not dating, casually dating, single but looking, separated, and divorced). No respondents indicated that they were widowed.

Q14: What is the duration of your current relationship status? Choices included “Less than 6 months,” “6 to 12 months,” “1 to 2 years,” “2 to 3 years,” “3 to 4 years,” “4 to 5 years,” and “More than 5 years.”

Q15: Are you satisfied with your current relationship status? Choices were “Yes” and “No.”

Q16: If you have had a significant intimate relationship dissolve in the past 5 years, do you think the breakup was due in part to your [preparation for] veterinary training? Choices included “Yes,” “No,” and “Not applicable.”

Q19: What is your current yearly household income? Categories were broken down into \$15,000 increments: “Less than \$15,000 per year,” “\$15,000 to \$30,000 per year,” “\$30,001 to \$45,000 per year,” “\$45,001 to \$60,000 per year,” and “More than \$60,000 per year.”

Q26: What impact, if any, has veterinary training had upon your significant intimate relationship(s)? Choices were “None/ no appreciable impact,” “I have less time for my partner but it is not a problem for the relationship,” “I have too little time for my partner and it is causing/ has caused problems for the relationship,” “At least one significant relationship has ended due to interference from my veterinary training,” or “I have deliberately chosen not to engage in any significant relationships during my veterinary training.” For the purposes of statistical analysis, these choices were converted to an ordinal scale (1-5) indicating degree of impact.

PSS: Totalled scores for the Perceived Stress Scale (Cohen et al., 1983).

RSE: Totalled scores for the Rosenberg Self-Esteem Scale (Rosenberg, 1965).

PQALS: Totalled scores for the Perceived Quality of Academic Life Scale (Okun et al., 1986).

KMS: Totalled scores for the Kansas Marital Satisfaction Scale (Schumm et al., 1977/2000).

SWLS: Totalled scores for the Satisfaction With Life Scale (Diener et al., 1985).

Discussion of Significant Correlations

Current relationship status (Question 13) was correlated with duration of relationship status (Question 14) such that a committed relationship status was more likely to have a longer duration ($r = -.564, p < .001$). Current relationship status was also correlated with whether a significant relationship had broken up in the past five years (Question 16) such that committed status increased the likelihood that the relationship had not broken up ($r = -.564, p < .001$). Finally, current relationship status was correlated with a negative impact upon the relationship (Question 26) such that those who were not committed were more likely to have chosen not to engage in a significant relationship or had experienced problems in a prior relationship due to their veterinary training ($r = .405, p < .001$).

Duration of current relationship status (Question 14) was correlated with satisfaction with current relationship status (Question 15) such that those with longer lasting relationships were more likely to be satisfied ($r = -.299, p < .001$). Duration of current relationship status was also related to relationship dissolution (Question 16) such that longer lasting relationships were less likely to have dissolved ($r = .503, p < .001$). Finally, those in longer lasting relationships were more likely to have higher annual incomes (Question 19; $r = .405, p < .001$).

Satisfaction with current relationship status (Question 15) was not highly correlated with many other items. However, it was strongly correlated with mean score on the Kansas Marital Satisfaction scale (Schumm et al., 1977/2000) with an $r = -.660 (p < .001)$, suggesting that those who were satisfied with their current relationship status were also satisfied with their current relationship. In addition, current relationship status was also correlated with mean score of the Satisfaction With Life Scale (Diener et al., 1985) with an $r = -.368 (p < .001)$, suggesting that

those who are satisfied with their current relationship status are also likely to be satisfied with their life in general.

On the other hand, having had a significant intimate relationship dissolve within the past five years (Question 16) was correlated with perceiving the impact of veterinary training upon a significant relationship (Question 26) such that those who'd had a relationship end were more likely to indicate that veterinary training had been problematic for their relationship ($r = -.443$, $p < .001$). Perceived impact of training upon a significant intimate relationship was positively correlated with the mean score on the Perceived Stress Scale (Cohen et al., 1983; $r = .300$, $p < .001$) suggesting that as stress increased, training was increasingly likely to have had a deleterious impact upon the trainee's intimate significant relationship. Likewise, the impact of veterinary training upon a significant intimate relationship was negatively correlated with the mean score on the Kansas Marital Satisfaction scale (Schumm et al., 1977/ 2000; $r = -.413$, $p < .001$), suggesting that those whose relationships were not as impacted by veterinary training were likely to be more satisfied with their relationship. Not surprisingly, impact of veterinary training upon significant intimate relationship was also negatively correlated with mean score on the Satisfaction With Life Scale (Diener et al., 1985; $r = -.299$, $p < .001$), suggesting that those who perceived that their relationships were not as impacted by veterinary training were also likely to be more satisfied with life in general.

Many of the strongest correlations found in this study were those between the five standardized instruments, which are at the core of the research questions. The scores of the Perceived Stress Scale (Cohen et al., 1983) were negatively correlated with the scores of the four other instruments thus: Rosenberg Self Esteem Scale (Rosenberg, 1965; $r = -.651$, $p < .001$), Perceived Quality of Academic Life Scale (Okun et al, 1986; $r = -.430$, $p < .001$), Kansas Marital Satisfaction scale (Schumm et al., 1977/ 2000; $r = -.408$, $p < .001$), and Satisfaction With Life Scale (Diener et al., 1985; $r = -.624$, $p < .001$). These correlations suggest that, as perceived stress increases, self-esteem, satisfaction with academic life, satisfaction with significant intimate relationship, and satisfaction with life in general all decrease.

On the other hand, the scores for the Rosenberg Self Esteem Scale (Rosenberg, 1965) were positively correlated with the scores for the Perceived Quality of Academic Life Scale (Okun et al., 1986), the Kansas Marital Satisfaction scale (Schumm et al., 1977/ 2000), and the Satisfaction With Life Scale (Diener et al, 1985) such that $r = .478$, $.350$, and $.611$ ($p < .001$ for

all) respectively. This suggests that as self-esteem increases, so does satisfaction with academic training, significant intimate relationship, and life in general. Likewise, the scores of both the Perceived Quality of Academic Life Scale (Okun et al., 1986) and the Kansas Marital Satisfaction scale (Schumm et al., 1977/ 2000) were positively correlated with the scores of the Satisfaction With Life Scale (Diener et al., 1985) such that $r = .516$ and $.508$ respectively ($p < .001$ for both), suggesting that as satisfaction with academic program and significant intimate relationship increase, so does satisfaction with life in general.

Having thoroughly reviewed the descriptive statistical findings of interest, the discussion will now turn to a review and analysis of the hypotheses presented in Chapter One.

Hypotheses

This section addresses the eight hypotheses that were presented in Chapter One. Most of the hypotheses were supported, though some of the correlations were not as strong as had been anticipated based upon the literature.

Hypothesis #1:

As perceived stress increases, perceived life satisfaction will decrease.

The Pearson's correlation between the Perceived Stress Scale-10 (Cohen et al., 1983) total score and the Satisfaction With Life Scale (Diener et al., 1985) total score was calculated to test this hypothesis. The result, $r = -.624$ ($p < .001$), provides moderately strong support for this hypothesis.

Hypothesis #2:

***Those who are satisfied with their relationship status
will report higher life satisfaction as well.***

This hypothesis was tested utilizing an independent t-test of the total Satisfaction With Life Scale (Diener et al., 1985) scores grouped by the yes/ no answers to survey Question 15, "Are you satisfied with your current relationship status?" The result, $t = 7.974$ ($df = 407$;

$p < .001$), provides support for this hypothesis, suggesting that there is a significant difference in the SWLS score means for those reporting satisfaction with relationship status ($\mu = 25.68$, $SD = 6.34$, $n = 290$) versus those who were not satisfied ($\mu = 19.97$, $SD = 7.12$, $n = 119$).

Hypothesis #3:

As satisfaction with significant intimate relationship increases, perceived life satisfaction will increase (the Buffering Hypothesis).

A Pearson's correlation between the Kansas Marital Satisfaction Scale (Schumm et al., 1977/ 2000) total score ($n = 302$) and the Satisfaction With Life Scale (Diener et al., 1985) total score ($n = 301$) was calculated to test this hypothesis. The result, $r = .508$ ($p < .001$), provided moderate support for it.

Hypothesis #4:

As perceived self-esteem increases, perceived life satisfaction will increase.

The Pearson's correlation between the Rosenberg Self-Esteem Scale (Rosenberg, 1965) total score ($n = 422$) and the Satisfaction With Life Scale (Diener et al., 1985) total score ($n = 417$) was determined to test this hypothesis. The result, $r = .611$ ($p < .001$), provided moderately strong support for it.

Hypothesis #5:

Female veterinary trainees will perceive significantly more stress during the training process than will male trainees.

This hypothesis was tested utilizing an independent t-test of the total Perceived Stress Scale-10 (Cohen et al., 1985) scores grouped by gender. The result, $t = 4.053$ ($df = 423$; $p < .001$), provided support for this hypothesis, suggesting that there is a significant difference in the PSS-10 score totals for female ($\mu = 29.83$, $SD = 6.87$, $n = 347$) versus male ($\mu = 26.34$, $SD = 6.77$, $n = 78$) veterinary students.

Hypothesis #6:

As age increases, the level of stress perceived during the training process will decrease.

The correlation between age and total PSS-10 scores was not significant ($r = .087$, $p < .74$). This hypothesis was also tested utilizing an independent t-test of the mean Perceived Stress Scale (Cohen et al., 1985) scores grouped by age. Age 25 was chosen as the initial split, since it was both the median and modal age indicated by the respondents ($n \geq 25 = 270$, $n < 25 = 154$). The result, $t = -.011$ ($df = 422$, $p < .992$) did not support this hypothesis.

Hypothesis #7:

As the trainee's satisfaction with their training program increases, their perceived level of stress during the training process will decrease.

A Pearson's correlation between the Perceived Quality of Academic Life scale (Okun et al., 1996) total score ($n = 421$) and the Perceived Stress Scale-10 (Cohen et al., 1985) total score ($n = 425$) was calculated to test this hypothesis. The result, $r = -.430$ ($p < .001$), provided moderate support for this hypothesis.

Regression Analysis

The Double ABCX Model (McCubbin & Patterson, 1983; Appendix A-1) of system stress guided the regression analyses. To briefly review, the model suggests that systems adapt (xX) to stressors (aA) and the resources available (bB) to cope with it as interpreted by the person's perception (cC). Thus, for the purposes of the analysis of this data set, the total score from the Perceived Stress Scale (PSS-10; Cohen et al., 1983) served as "aA," potential resources (bB) included self-esteem, academic satisfaction, and relationship satisfaction. Perception of resources (cC) were the total scores for the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965), the Perceived Quality of Academic Life Scale (PQALS; Okun et al., 1986), and, for those who were in a committed relationship, the Kansas Marital Satisfaction Scale (KMS; Schumm et al., 1977/ 2000). Coping was not measured independently of perceived stress in this research. Adaptation (X) was represented by the total score on the Satisfaction With Life Scale (SWLS; Diener et al., 1985; Appendix A-2). Using path analysis, several regressions were run for the entire data set, as well as separately for the female and male subsets, to develop a model that best

described the interrelationships of the independent variables (PSS-10, RSE, PQALS, and KMS) explained adaptation (SWLS). However, because there were so many women in the sample, the model for the entire sample and the female subset were almost identical. Thus, only the results for the female and male subsets are reported.

Regression Analysis for the Female Sample

Path analysis tests how well a correlation matrix fits one or more causal models. Because the Double ABCX Model (McCubbin & Patterson, 1983) was determined to closely represent what the literature review suggested about the interaction of the primary variables, the analysis done for this research was a confirmatory path analysis of that model. The process for a path analysis involves doing a series of regressions in which each variable in the model is entered as a dependent of the others in order to determine how the variables best fit together to explain the outcome. Regression weights predicted by the model are compared with the correlation matrix for the variables for confirmation. The beta coefficient indicates the extent of effect that an independent variable has upon a dependent variable, controlling for other prior variables. The assumptions of path analysis are the same for regression, though path analysis is “particularly sensitive to model specification because failure to include relevant causal variables or inclusion of extraneous variables often substantially affects path coefficients, which are used to assess the relative importance of various direct and indirect causal paths to the dependent variable” (Garson, 2006, p. 1).

Given that the majority of subjects were female, the results of the regression analyses for the entire sample were overshadowed by the female sample. Therefore, it was decided to report the analysis by gender set only. Results for the female sample are summarized in Table 4.8. In the first regression, the SWLS score was entered as the dependent variable and all four other scores (PSS-10, RSE, PQALS, and KMS) were entered simultaneously as independent variables, as they all showed a significant correlation with the SWLS score. A total of 248 female respondents had completed all five surveys, yielding 245 degrees of freedom for the analysis. Over half ($R^2 = .525$) of the variation in SWLS was explained by this model, with all four of the independent variables contributing significantly ($p < .002$) to the variation thus: PSS, $\beta = -.255$; RSE, $\beta = .186$; PQALS, $\beta = .270$; and KMS, $\beta = .235$.

Per the process of path analysis, it was determined that perceived stress (PSS-10) had a significant effect on self-esteem ($R^2 = .419$, $df = 343$, $\beta = -.647$, $p < .001$), and that self-esteem had a significant effect on academic satisfaction, which increased slightly when marital satisfaction, which did not have a significant effect on academic satisfaction, was removed. The removal of relationship satisfaction also increased the impact of perceived stress to a significant level ($R^2 = .270$, $df = 246$; PSS-10 $\beta = -.176$, $p = .013$, and RSE $\beta = .390$, $p < .001$). Perceived stress also had a significant effect on marital satisfaction, which increased slightly when academic satisfaction was removed. In addition, self-esteem had a slightly significant impact on marital satisfaction after academic satisfaction, which did not have a significant impact on relationship satisfaction, was removed. The R^2 for this equation was .220 for 246 degrees of freedom; PSS-10 $\beta = -.360$ ($p < .001$), and RSE $\beta = .149$ ($p < .05$). In addition, satisfaction with life and self-esteem both had a significant impact on academic satisfaction ($R^2 = .352$, $df = 245$; SWLS $\beta = .369$, RSE $\beta = .267$, $p < .001$ for both), though PSS and KMS did not. Interestingly, when RSE was removed, PSS became slightly significant to academic satisfaction, though it was slightly less impactful than previously reported, $\beta = -.150$ ($p < .05$). Removal of RSE also increased the impact of SWLS on academic satisfaction to $\beta = .447$ ($p < .001$). Relationship satisfaction did not have an impact on academic satisfaction for the women. Finally, life satisfaction had a significant effect on relationship satisfaction, with $R^2 = .258$ ($df = 245$), and $\beta = .507$ ($p < .001$).

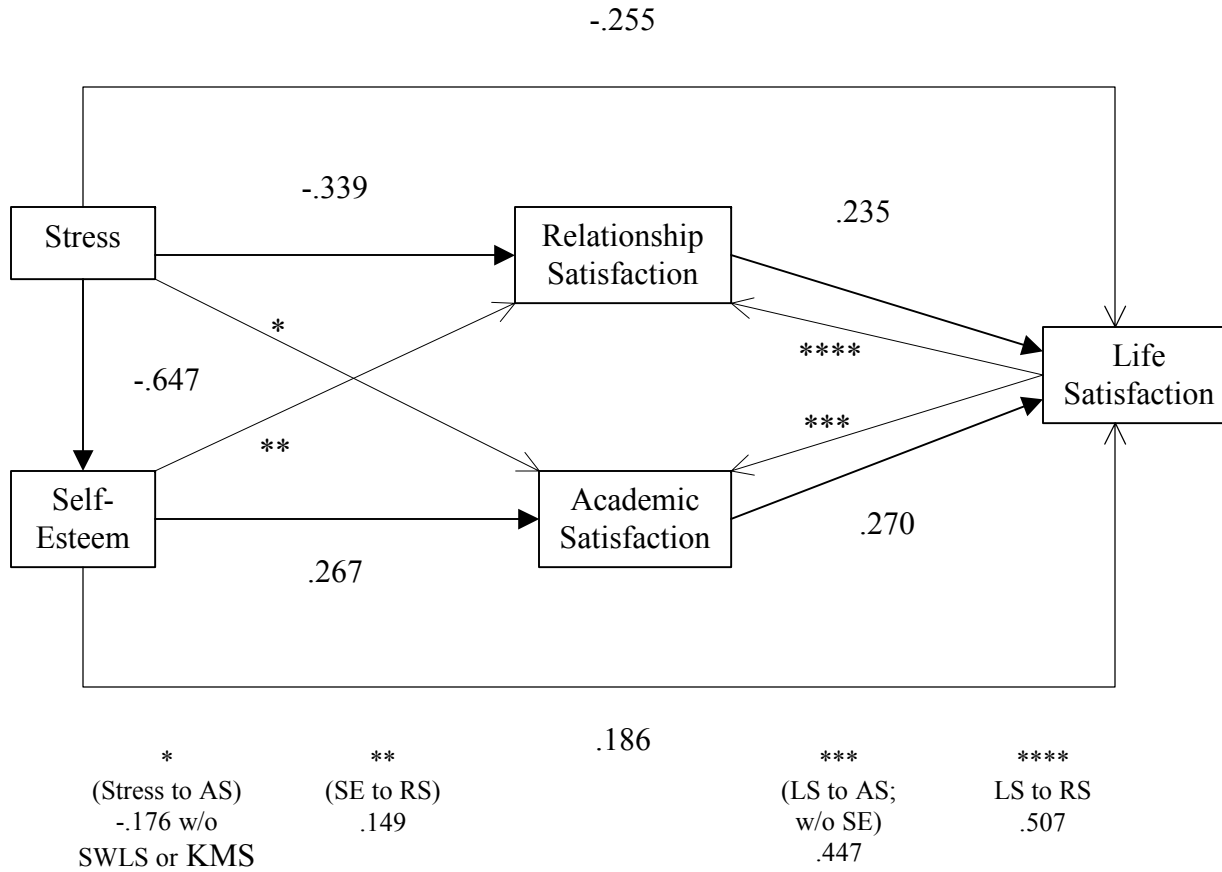
Table 4.8: Steps of Path Analysis – Female Sample

<i>Step</i>	<i>df</i>	<i>R2</i>	<i>Dep Variable</i>	<i>Indep Variable</i>	<i>B</i>	<i>SE B</i>	β	<i>Sig</i>
1	245	.525	SWLS	PSS	-.241	.057	-.255	.000
				RSE	.198	.065	.186	.003
				PQALS	.423	.082	.270	.000
				KMS	.569	.123	.235	.000
2	343	.419	RSE	PSS	-.567	.036	-.647	.000
3a	246	.280	PQALS	PSS	-.081	.044	-.135	.068
				KMS	.174	.095	.113	.068
				RSE	.254	.048	.373	.000
3b	246	.270	PQALS	PSS	-.106	.042	-.176	.013
				RSE	.265	.048	.390	.000
4a	246	.230	KMS	PSS	-.132	.029	-.339	.000
				PQALS	.078	.043	.121	.068
				RSE	.045	.034	.102	.186
4b	246	.220	KMS	PSS	-.140	.028	-.360	.000
				RSE	.066	.032	.149	.042
5a	245	.352	PQALS	PSS	-.018	.044	-.031	.678
				SWLS	.235	.046	.369	.000
				KMS	.018	.095	.012	.850
				RSE	.182	.048	.267	.000
5b	245	.313	PQALS	PSS	-.090	.041	-.150	.029
				SWLS	.285	.045	.447	.000
				KMS	.028	.098	.018	.772
6	245	.257	KMS	SWLS	.210	.023	.507	.000

Resulting Model for the Female Subset

A path analysis model of variable interaction for the female sample, based upon these regression analyses, is presented in Figure 4.1. This model was developed by considering the strongest associations between variables, based on the beta coefficients determined by the regression analyses, as compared with the Double ABCX model (McCubbin & Patterson, 1983; Appendix A-1) upon which the hypotheses of this research were based. The data support this model quite well for the female sample. The strongest effect of stress was found to be upon self-esteem level, which moderated the effect of stress upon academic satisfaction. Stress also directly affected relationship satisfaction. Relationship satisfaction and academic satisfaction were not at all related. There were also significant, but less powerful, effects of stress on academic satisfaction, self-esteem on relationship satisfaction, and stress and self-esteem on general life satisfaction. The most powerful effects, though, were as predicted, with relationship satisfaction and academic satisfaction directly effecting general life satisfaction. The mutual effect of life satisfaction on both relationship satisfaction and academic satisfaction was also strong, but this fits with the literature and the Double ABCX model (McCubbin & Patterson; Appendix A-2) as well since life satisfaction indicates adaptation across time, and thus feeds back into the interaction.

Figure 4.1: Regression Model with Corresponding Beta Coefficients for Female Sample



Regression Analysis for the Male Subset

Results for the male subset of the sample were notably different than they were for the females for the same path analysis, and, given the relatively small sample size, there was concern about the power of the results. However, a review of Cohen and Cohen (1975) suggests that the power of the results is moderate to strong, as a sample size of 53 provides strong power for detecting a beta coefficient of 0.40 or above, and moderate power for detecting a beta coefficient of 0.30. In the initial analysis, when perceived stress, self-esteem, academic satisfaction, and relationship satisfaction were entered as independent variables, with life satisfaction as the dependent variable, only stress and relationship satisfaction showed any significant impact ($R^2 = .590$, $df = 53$; PSS $\beta = -.385$, $p < .02$; KMS $\beta = .378$, $p < .001$). Further analyses suggested that stress was the primary variable of impact. Indeed, its greatest impact appeared to be upon self-esteem ($R^2 = .467$, $df = 76$, $\beta = -.683$, $p < .001$). Stress also had a significant impact on academic satisfaction, which was greatest when relationship satisfaction and life satisfaction were part of the equation ($R^2 = .351$, $df = 53$, $\beta = -.462$, $p < .01$). The only variable that had any impact on relationship satisfaction for the men was life satisfaction ($R^2 = .264$, $df = 54$, $\beta = .514$, $p < .001$). A summary of the results of the regression analyses for the male subset appears in Table 4-9.

Resulting Model for the Male Subset

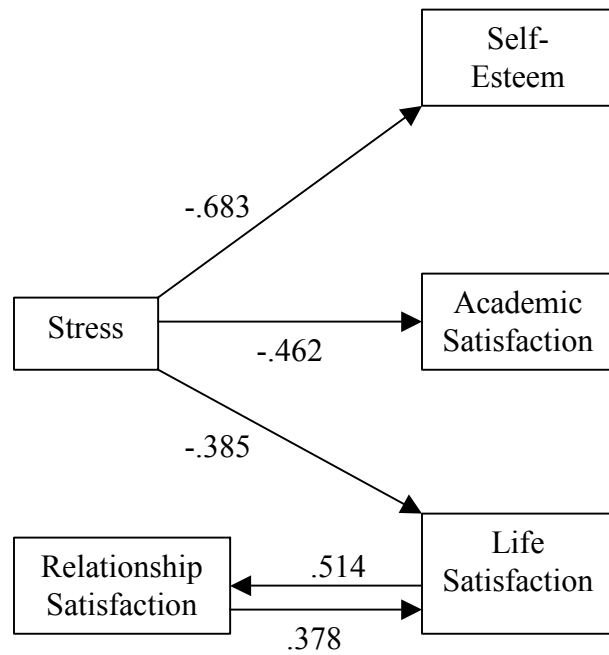
A path analysis of variable interaction for the male subset is presented in Figure 4-2. This model was also developed by considering the strongest associations between variables based on the beta coefficients determined by the regression analyses for the male subset. It is considerably different than that for the entire sample and the female subset. Stress still exerted the strongest direct effect on self-esteem, but it also exerted a strong direct effect on both academic and general life satisfaction. Stress did not exert a significant effect on relationship satisfaction. Neither self-esteem nor academic satisfaction exerted a significant effect on life satisfaction, or on each other. However, relationship satisfaction did exert a fairly strong effect on life satisfaction, and there was an even stronger effect of life satisfaction on relationship satisfaction.

Having summarized the results of the complete data analysis, the author will now turn to a discussion of the results in terms of their interpretation and implications for future research and for veterinary students, training programs, and the field of marriage and family therapy.

Table 4.9: Summary of Regression Analyses for Variables Predicting Adaptation to Stresses of Veterinary Training – Male Subset

<i>Model</i>	<i>Total df</i>	<i>R²</i>	<i>Dependent Variable</i>	<i>Independent Variable</i>	<i>B</i>	<i>SE B</i>	<i>β</i>	<i>Sig.</i>
1	53	.590	SWLS	PSS RSE PQALS KMS	-.348 .159 .190 .894	.130 .152 .153 .230	-.385 .138 .139 .378	.010 .300 .223 .000
2	76	.467	RSE	PSS	-.547	.068	-.683	.000
3a	53	.337	PQALS	PSS KMS RSE	-.328 -.292 .121	.111 .208 .139	-.495 -.169 .144	.005 .167 .387
3b	53	.311	PQALS	PSS RSE	-.302 .110	.110 .140	-.456 .131	.008 .434
4a	53	.119	KMS	PSS PQALS RSE	-.128 -.129 .051	.078 .092 .093	-.334 -.224 .104	.106 .167 .587
4b	53	.084	KMS	PSS RSE	-.089 .037	.073 .093	-.232 .075	.231 .697
5a	53	.357	PQALS	PSS SWLS KMS RSE	-.263 .159 -.426 .092	.122 .129 .234 .140	-.397 .218 -.246 .109	.036 .223 .075 .514
5b	53	.351	PQALS	PSS SWLS KMS	-.306 .174 -.430	.102 .126 .232	-.462 .237 -.249	.004 .176 .070
6	54	.264	KMS	SWLS	.215	.049	.514	.000

Figure 4.2: Regression Model with Corresponding Beta Coefficients for Male Sample Only



CHAPTER 5 - DISCUSSION

The purpose of this chapter is to review this research study in light of the findings, conclusions, and implications for further research and practice within the fields of Veterinary Medicine and Marriage and Family Therapy. The main focus of this study was to examine the associated effects of the stresses of veterinary training and significant intimate relationships. Specifically, the author desired to determine whether the process of veterinary training was deleterious to significant intimate relationships or if significant intimate relationships buffered the stresses of veterinary training for the trainee. The Double ABCX Model (McCubbin & Patterson, 1983; Appendix A1) provided a paradigm for the examination of this process and allowed for the inclusion of the intervening variables of self-esteem and satisfaction with the veterinary training program. Other demographic and descriptive variables, such as gender, age, year of study, and relationship status, were also evaluated to determine if they had any significant impact upon the primary variables. As the study of veterinary student stress is a relatively new field, literature from the broader field of medical training in general comprised the bulk of information drawn upon in developing the hypotheses for this study. The hypotheses were tested utilizing Pearson's correlations, t-tests and chi-square tests. Regression analyses were run to ascertain likely associations among the primary variables of interest.

Design

A web-based survey consisting of 30 demographic and descriptive questions, as well as five standardized survey instruments, was offered via an e-mail link to approximately 1825 first through fourth year veterinary trainees at five accredited veterinary training programs in the United States. Although the survey was intended to include Interns and Residents, none of the 466 respondents to the survey were post-graduates. It is not known why these advanced trainees did not participate. It could be that they felt they didn't have the time to contribute, or perhaps they did not receive the email containing the link to the survey. A nearly equal number of first, second, third, and fourth year students were represented in the sample. The sample was slightly, but significantly, older (by two years), more female (by six percent), and more Caucasian than the national average for all veterinary students. However, the median age reported was 25, with a

range of 20 – 46, and the survey was taken halfway through the year as opposed to at the beginning of the year, so it may be that the actual age of the respondents is not that different from that of the national average. The reported GPA of the sample was slightly lower than the national average GPA for veterinary trainees. The majority of the sample (over 88%) had completed at least a Bachelor's degree prior to entering their veterinary training program.

Summary and Discussion of Findings

Descriptive Data

Reasons to Pursue a Career in Veterinary Medicine

In general, findings for the descriptive data were as expected, based upon prior research in the fields of veterinary medicine, human medicine, other professional training programs, and graduate study in general. Specifically, most veterinary students surveyed pursued training in veterinary medicine because they “felt called” to do so and “loved animals.” This is not terribly surprising, as most people pursue a career that requires advanced training for similar reasons. No questions were asked regarding the respondents’ past, so it is unknown why they “felt called” to veterinary medicine or where their “love of animals” came from. However, it seems that quite a few young women in particular often have an affinity for animals and this may be reflected in the number of women who currently are pursuing veterinary medicine as their career of choice. Interestingly, previous studies (e.g., Brown & Silverman, 1999) have found that veterinarians have not ranked financial incentives that highly, compared to other reasons to pursue this career. Perhaps women, in general, are more likely to pursue a career for personal, rather than financial reasons, and the high number of women pursuing veterinary medicine at present may also reflect this. It is interesting to note, however, that, of all the choices offered to respondents as motivations for pursuing this career, “financial incentives and lifestyle” was the one that had a significant (though weak) correlation with perceived stress. Perhaps students hope that their earnings as a veterinarian will provide sufficient income to support their family and their goals. The \$57,000 average annual income is a decent [second] income – and a significantly greater amount than the less than \$15,000 annual income that the majority of respondents indicated they were currently living on.

Sources of Stress

The primary reported sources of stress during training were grades, time constraints, and relationships with significant others. These findings support those of Kent-Arce (1991) and Melbo (1981), who found that veterinary students named academic issues and lack of time as their biggest stressors. These findings also echo those of Bjorksten et al. (1983), Heins et al. (1984), and Lloyd & Gartrell (1983) in their studies of medical students, who also listed personal performance and time constraints among their major stressors. Given the highly competitive nature of veterinary training, it is not surprising that grades were reported to be a major stressor. Particularly for those who plan to pursue further study, grades and class rank are important considerations when it comes to being chosen for assistantships, scholarships, and internships.

As veterinary students take, on average, the equivalent of 21 credit hours of study per semester, it is no surprise that they listed time constraints as a stressor. Finding time to study adequately, especially once the student was expected to participate in clinical work, would be a challenge. This would be particularly true for those who have additional responsibilities, such as a significant relationship and/ or a child or children for whom they must provide care. Relationships take time to nurture and maintain. Expectations about the training process are an important consideration in this regard. If the trainee and their significant other were expecting that the training program would be quite time consuming, comparative lack of time for the relationship might not have as negative an impact upon the relationship as it might otherwise.

Funding for Training

Loans were, by far, the major source of funding for the veterinary trainees who responded to this survey, with loans of up to \$75,000 reported by nearly 75% of the respondents. Not surprisingly, more advanced students were more likely to have accrued greater loan debt. Few individuals or families have the financial resources to pay out of pocket for advanced training of this caliber. Even if they did, because student loan money is “cheap” compared to other loan money, they might take out a loan anyway. Loan debt is a concern, however, given that salaries for veterinarians in private practice, the first choice of career for nearly 63% of this sample, currently averages only slightly more than \$57,000 per year for those in private practice (Cron et al., 2000). This could be reflected in the choice of “finances” as a fairly major stressor by nearly 55% of the respondents.

However, it is possible that respondents were focusing on their current situation, rather than the future. A large percentage of the respondents, nearly 56%, indicated that their current annual income was less than \$15,000, which isn't much above the current poverty threshold for a family of two (US Dept of Health & Human Services, 2006). Strand, Zaparanick, & Brace (2005) reported that 65 – 75% of the cash flow of the veterinary students in their study came from loans. Nevertheless, researchers of recent veterinary graduates (Brown & Silverman, 1999) have indicated that finances become more of a concern once the graduates enter their careers because veterinary incomes have not kept pace with student loan debt.

Relationship Status and Satisfaction

Nearly 85% of this sample indicated that they were currently involved in a committed relationship and many (31%) of them reported being involved in their current relationship for five years or more. Given that the average age of this sample is 26 years, this is not surprising, as according to Erikson (1965) people in this stage of development would be working on resolving the Intimacy vs. Isolation stage. Most in relationships (71.56%) indicated that they were satisfied with their relationship. However, nearly a third of the respondents indicated that a significant relationship had broken up within the past five years, due to their pursuit of or preparation for veterinary training, and nearly 46% indicated that their veterinary training process had been problematic for their significant relationship. Given the competitiveness to enter and the strenuous requirements of veterinary training programs, it is not surprising that this process may be hard on relationships, especially those in their infancy, when time and attention are important to building relational strength. Choosing and balancing priorities is a difficult and complicated process for many people throughout their lives. It may be particularly difficult for young adults who don't have the wisdom of experience to draw upon. Another reason that some relationships may end during this time may have to do with the availability of other mates from whom to choose. It would make sense that those who pursue a career in veterinary medicine would share similar values and beliefs and certainly could empathize with each other, regarding the demands and time constraints of the curriculum. If a trainee's significant other was perceived as unsupportive or too demanding or uninteresting, another trainee from within the program, who offers support and understanding, may become an appealing option (e.g., South, 1996). However, many (over 34%) of those in relationships reported that their partners worked approximately full-time as professionals (20%) or were graduate students. These relationships

may be more likely to be successful, if there is mutual understanding of the time constraints both partners experience, and there are reasonable expectations for self and other regarding time devoted to the relationship and to household responsibilities.

Very few (28) of the respondents had children. Those that did have children reported that the children were fairly young, most less than five years of age. Again, this is not surprising, given the age and stage of development of the respondents, particularly since they have chosen to pursue a professional career. Several of the respondents stated that they want to have children but have chosen to wait until they complete veterinary training to do so, as they feel it would be too difficult to juggle the multiple responsibilities that would go along with attending school and parenting.

Communication Skills Training

Communication skills training has been recognized as an important component of veterinary training by several researchers (Brown & Silverman, 1999; Butler, Williams, & Kole, 2002; Gelberg & Gelberg, 2005). Anecdotal evidence from the author's experience of teaching such skills to veterinary students suggests that this training could be beneficial to students' significant relationships as well. Thus, several questions were asked of the respondents in regard to communication skills training. Slightly more than half (nearly 54%) of the respondents stated that there was no formal communication skills training program at their schools and over 30% stated that they were not required to have any communication skills training at all. Nearly 76% indicated that they'd had less than ten (10) hours of communication skills training throughout their college careers. This lack of training was listed as a key concern by Brown and Silverman, based on their interviews with focus groups of veterinarians in private practice, academics, government, and industry, and new professionals and veterinary students. These same authors noted, however, that most of the respondents in their study did not recommend adding communication skills training to the already strenuous and packed veterinary training curriculum. Most suggested that communication skills training be a required prerequisite. This might improve trainees' general communication skills but reinforcement of these skills, as they apply specifically to veterinary medicine through focused training with feedback and mentoring, would further enhance their effectiveness and, perhaps, provide additional support for maintaining and improving significant relationships.

Counseling Services

Finally, respondents were asked about the availability and their utilization of counseling services. Forty-five percent of the respondents indicated an awareness that counseling services were available to them, though some noted that these counseling services were provided through the University and were sometimes difficult for veterinary students to access. Though there are a growing number of veterinary programs that provide some on-site counseling services for their students, many do not. Unlike other graduate study, veterinary students are in class most of the day, every day Monday through Friday, and thus they don't generally have time to go to an hour of counseling on a regular basis. To complicate matters, most university counseling services are located on the main campus, while most veterinary schools are located on the outskirts of the campus or even several miles from it. Regrettably, there is still a stigma surrounding mental health treatment and, even if a counseling program is offered on-site, students may not participate in it, due to concerns about what colleagues and faculty might think. Nevertheless, slightly more than a third of the respondents (36.5%) indicated that they had or would utilize these services if they were available.

The primary reasons students said they had or would seek counseling included "stress management," "anxiety," "depression," and "significant relationship issues." These reasons parallel those indicated as creating the most stress by the respondents in this study and echo the findings of Kogan et al. (2005) in their assessment of veterinary student non-academic stressors. They are also common reasons why many people in the general population seek mental health assistance.

Most respondents (nearly 66%) did not know if counseling services were available to their significant others or not. This is unfortunate but also not surprising, given the number of respondents who didn't know whether counseling was even available to them. Some student counseling centers may offer relational counseling, but this may depend upon what types of counseling training is available on campus, if any. For instance, the two universities where the author has worked both offer training programs in Marriage and Family Therapy and had on-campus training clinics where relational therapy was offered. At any rate, it is clear that whatever counseling services are available need to market their services more effectively to these students and may need to consider making some changes in their programs, in order to be available to

veterinary trainees (and their significant others) during times when and in locations where this population can more readily access these services.

Hypotheses

The findings also supported most of the seven hypotheses for this research, which were based upon the literature from veterinary medicine, human medicine, and professional and graduate school programs. The first hypothesis proposed that, as perceived stress increased, life satisfaction would decrease. This hypothesis had moderate support from this research, as well as support from previous literature (Chang, 1998; Day & Jreige, 2002; Linn, Yager, Cope, & Leake, 1985). Though sometimes it appeared that other variables may moderate this relationship, there seems to be a fairly consistent inverse relationship between perceived life stresses and general life satisfaction across populations. This makes intuitive sense. Though some of us handle, and even embrace, stress more successfully than others, the more stress we experience the more overwhelmed we begin to feel and the less satisfied we are with life, at least for a time.

The second hypothesis suggested that as satisfaction with relationship status increased, perceived life satisfaction would increase as well. It was strongly supported. Whether or not a person is involved in an intimate relationship, if their relationship status is what they want it to be, it makes sense that they would be more satisfied with their life in general as well. It is important to take note that a very high percentage of the survey respondents (85%) reported being involved in a committed relationship. It is also important to note the developmental stage of the majority of the respondents. There is still societal pressure to get married during this stage. Thus, another reason why these respondents might express satisfaction with their relationship status is because they are meeting societal expectations by forming (or having formed) a committed relationship.

The third hypothesis stated that as satisfaction with one's significant intimate relationship increased, perceived life satisfaction would also increase. It also received moderately strong support from the data. Again, this makes sense. Our significant relationships are central to our lives. If they are going well, people generally feel good about themselves and about life in general. If they aren't going well, the individual may begin to question their importance and success with life, which may well have a deleterious effect on general life satisfaction.

Similarly, the fourth hypothesis, which proposed that as perceived self-esteem increased, so would perceived life satisfaction, was also supported. This makes sense for many of the same reasons that have been mentioned already. If one feels good about oneself, he or she is likely to feel better able to cope with the stresses and problems he or she faces in life and, therefore, will also likely feel satisfied with life in general.

Hypothesis Five suggested that female veterinary trainees would perceive significantly higher levels of stress than would male trainees. The literature was conflicting about this, with some suggesting that there was a gender difference in reported stress levels and others suggesting there was not. This data strongly supported this hypothesis. It is not known if women actually experience more stress or if they are just more forthcoming about reporting the stress they do experience. Either possibility could conceivably make sense, particularly for those women who are attempting to “have it all” (both family and career) all at the same time. Although there are many men who reportedly desire to be more involved in their household and family lives, research continues to conclude that women still tend to maintain greater responsibility for household and childrearing responsibilities (Bittman, England, Sayer, Folbre, & Matheson, 2003; Press & Townsley, 111998; Singleton & Maher, 2004). Perhaps this is because they are less likely to let things go (e.g., to let the house stay cluttered) or perhaps it is because women are still strongly socialized to attend to relationships and others’ comfort levels.

The other validated hypothesis was the seventh one, which stated that as a trainee’s satisfaction with their training program increased, their perceived level of stress would decrease. It received moderate support. Once again, this makes intuitive sense. An individual who has committed themselves to four years of grueling training in order to become a veterinarian, if pleased with their training program, will logically be pleased with life in general. They are doing what they want to do, which generally supports satisfaction.

The sixth hypothesis was not well supported by this data. It proposed that those trainees that were older would experience lower perceived stress during the training process. The correlation between age and total score on the PSS was not strong or significant ($r = .087$, $p = .073$). Utilizing a t-test and grouping the sample by age, when age 25 (the median age) was used as the cutoff, the t-score was not significant either. This finding may be related to the prior hypotheses that were supported, in that no matter what an individual’s age, if they are doing what

they want to do, feel good about doing it, and their expectations of the process are being met, they are likely to be satisfied in general.

Regression Analysis

Female Subset

The regression analyses supported the proposed model, the Double ABCX Model (McCubbin & Patterson, 1983), fairly well for the sample as a whole and for the female subset of the sample. Indeed, because the sample was mostly female, the model for the entire sample was almost identical to that of the female subset. Therefore, results and models were reported for the female and male subsets only. Perceived stress was an important factor, with primary interaction effects on both relationship satisfaction and self-esteem, as has been described in previous sections. Self-esteem appeared to be an intervening variable between stress and academic satisfaction, but wasn't important to relationship satisfaction. This makes sense from the standpoint that, if one feels good about oneself and is capable of handling the academic challenges one faces, it is more likely that the individual will be satisfied with her academic program. Both stress and self-esteem had a small direct effect on life satisfaction but their influence on life satisfaction was not as strong as that of both relationship satisfaction and academic satisfaction (Figure 4-1). Again, especially given the stage of development in which many of the veterinary trainees are, this makes sense because relationships and career development are of utmost importance. For the women, it appears that perceived stress affects relationships directly, and academic satisfaction indirectly through self-esteem, while both relationship satisfaction and academic satisfaction impact general life satisfaction, which in turn appears to affect both academic and relationship satisfaction. This confirms the general findings of previous literature regarding veterinary training. Furthermore, these findings suggest that female veterinary students may be fairly good at setting emotional boundaries between their school and home environments. However, the research also suggests that there is a less direct and more indirect relationship between academic and relationship satisfaction but, through general life satisfaction levels, these variables do affect each other.

Male Subset

The number of male subjects completing the instruments from which the data was derived was smaller ($n = 53$) than standard recommendation of 30 to 40 per variable (Cohen, 2001), so there was initial concern that results should be interpreted with caution. However, further consultation with Cohen and Cohen (1975) suggested that the power of these results was moderate to strong after all. It appeared that, for the men in this sample, stress had a direct effect on academic satisfaction and life satisfaction, as well as on self-esteem. Thus, the more stress these men experienced, the less satisfied they were with their academic program and their life in general and the lower their self-esteem was. Given that men have traditionally been socialized to correlate their self-image with their success at what they are doing, this makes sense. If they feel so stressed out that they aren't doing as well in their training program as they'd like to, it would make sense that both their self-esteem and their satisfaction with life in general would decrease. On the other hand, if they feel they are "on top of their game" and doing well, the happier they would be with the training program, and with life in general. It appears that perceived stress did not impact their level of relationship satisfaction but their relationship satisfaction did have an impact on their life satisfaction, and vice versa. Indeed, general life satisfaction had a stronger impact on relationship satisfaction than the other way around (Figure 4-2). Prior research suggests that married men tend to experience less stress and report feeling happier in general (e.g., Metz, 1991). Perhaps they view their significant relationship as a haven away from the stresses of life as it is elsewhere, such that stress does not significantly impact their relationship satisfaction. However, if their relationship is not going well, this may have a detrimental effect on their satisfaction with life in general and subsequently with their veterinary academic pursuits. Furthermore, if they are dissatisfied with life in general, and bringing this attitude home, it makes sense that it could be deleterious to their significant relationship. On the other hand, if they are happy and feel good about life in general it makes sense that this would also carry over to home and have a positive impact on their significant relationships (e.g., Bolger et al., 1989). Presumably, if they are satisfied with their life in general, and thus with their intimate significant relationship, they may in turn feel less stressed overall.

Limitations

As with any research study, this one had some limitations worth noting. In particular, the sample was not exactly representative of the average sample of current veterinary trainees in the United States. This sample was more female than average (82% vs. 76%), slightly older than average (26 years of age vs. 24 years of age), and more Caucasian than average (92% vs. 85%). Neither the West nor the Northeastern regions of the United States were represented by programmatic participation (although some of the students surveyed could have been from these regions) and there were no Interns or Residents who participated. Why they didn't participate is unknown but it could have been due to time constraints, or because they did not receive the survey link. Finally, significant others of veterinary trainees were not surveyed for this research (unless both partners were veterinary trainees but this was not trackable in the present study).

The timing of the survey could be considered to be another possible limitation. Though several veterinary professionals suggested that sending the survey out early in the second semester, as was done, constituted the best timing, it is possible that sending the survey out at another time, such as the end of the school year, might have yielded different results, or increased the number of respondents who participated. The response rate for this study (25%), though acceptable, was a bit low.

Finally, the survey itself could have been a limitation, as it was considered to be a bit long according to several participants. The ranking questions, in particular, showed significant attrition in response rate as the survey progressed, and they were difficult to analyze. Several respondents indicated that some of the questions seemed redundant and one respondent expressed irritation that the response sets for some of the questions were too narrow ("transgendered people can be vet students too!"). Though the survey was quite "user friendly" to anyone familiar with using Windows and the World Wide Web, it might have been somewhat intimidating to participants who did not have much experience with computers or these formats. Also, the survey program itself did not allow for comments for all types of questions, which may have yielded additional information that might have been helpful in interpreting some of the responses.

Implications for Future Research

Having reviewed possible limitations of the current research, the discussion will now turn to implications for future research in this area. Because research in this area is still in its infancy, much can be done in the future, both quantitatively and qualitatively to further the understanding of how the stresses of veterinary training interact with trainees' significant intimate relationships.

Quantitative Research Possibilities

Further quantitative research could consider how the stress of veterinary training impacts and is impacted by the type of committed relationship (married vs. non-married but committed). Significant others could also be surveyed to ascertain their perspectives as to how their relationship was impacted by the veterinary training process. Also, although self-esteem has traditionally been a popular research variable, the current study suggested that its value in helping to explain the association among the primary variables of this research is questionable. It may be that another variable, such as locus of control, would have more explanatory power. It would also be enlightening to compare those with high versus low relationship satisfaction, with those with high versus low academic satisfaction and/ or high versus low grade point average and, perhaps, with those with high versus low life satisfaction, to determine if there were any significant correlations between the variables in this way. Are those who are high achievers also highly satisfied individuals? Finally, although an assessment of perceived coping was measured as a part of perceived stress, a study focused on specific coping skills of trainees and their significant others might shed light on why it is that some students and their significant relationships thrive under these stressful conditions, while others do not. Finally, a longitudinal study of a cohort of veterinary students that focused on how they, and their significant relationships, adapt to the on-going stresses of veterinary training would shed light on the process of adaptation over time.

Qualitative Research Possibilities

Based upon the experience of this research study, the author recommends that ranking questions be minimized in future studies, since respondents appeared to be reluctant to take the time to answer them. Likert scale questions might provide more accurate information. However, some specific qualitative explorations about particular aspects of this research might be

enlightening. For instance, since a sizeable minority of the respondents to this research suggested that preparation for and participation in veterinary training was a contributing factor in the dissolution of a significant intimate relationship, asking a selection of veterinary trainees to comment directly upon how their significant intimate relationships were affected by the stresses of veterinary training, and what those stresses were, might provide more information to both veterinary training programs and counselors as to how to manage those stresses more effectively, as well as assist trainees in maintaining their relationships. It would further enrich this research if significant others were interviewed as well. It might also be enlightening to inquire for specifics regarding how communication skills training, and/ or counseling services were helpful to students (and their significant others) who took or utilized them. Also, it might be useful to students and programs, as well as to counselors, to interview veterinary professionals at various stages of their careers to find out how the stresses they've faced have impacted their significant relationships, and how they and their significant others coped with these stresses. In particular, given the gender shift in veterinary medicine, it would also be interesting to interview female veterinary professionals to gather information from them about their experiences within the field, and how they perceive that things have changed since they were students. More generally, it would also be interesting to analyze in what ways the gender shift has affected the field, if indeed it has, according to the perceptions of both genders.

Implications for Veterinary Training Programs

Times have changed. Whereas professional training programs, including veterinary programs, used to be able to assume that students were prepared to devote their full attention to their training, this is no longer true. The majority of veterinary trainees now are female, and many desire to have not only a successful career but a successful family too. This is probably true of male trainees as well, as many men want not only to provide adequate financial support for their families but also to be involved husbands and fathers. Most students who are involved in significant relationships, have partners who are also students or who work at least part time. Thus, many students are attempting to balance more responsibilities and may have to make sometimes-difficult choices about their priorities. Because the gender demographics of veterinary training have changed so significantly, this study provides evidence that the strategies for managing stress that worked in the past for a primarily male student population may no

longer be effective for the predominantly female student population. Although most veterinary faculty members have probably always tried to be understanding and supportive of special circumstances, programs may have to be increasingly flexible in working with students to support their efforts to meet their responsibilities outside the training program while also encouraging successful completion of the program. In addition, faculty may also be called upon to serve as mentors for students regarding how to balance these various responsibilities. At present, as most training faculty members are male, female trainees may be at a disadvantage in finding female mentors and role models. Fortunately, as more women enter faculty positions, this will become less of a problem. Mentoring can be time consuming but is an important factor in professional development and therefore should be actively encouraged and time allowed for it within training programs.

Although the results of this study did not provide strong statistical support for the importance of communication skills training, other studies have (Butler et al., 2002), and comments by respondents in this study lend support to this type of training as well. Some comments from this research included, “Communications Skills are provided as an elective. I strongly believe that this type of training should be REQUIRED for ALL veterinary students,” “We have had some, but I am saying no because I do not feel that it is enough,” and “No, no, no. And, it really should.” It is encouraging to note that many veterinary training programs are seeking ways to incorporate this type of training into their curriculum somehow.

Likewise, although a majority of the respondents to this research indicated that they would not seek counseling assistance, those who said they would indicated that stress management, anxiety, and relationship issues were primary reasons they would do so. These issues can often be successfully addressed in counseling. The number of veterinary programs providing for direct counseling services to their students is on the rise, and brief psychoeducational courses or workshops could also be offered to address them. This is encouraging, as it suggests that veterinary programs are recognizing the importance of providing support to students for matters other than academic issues. When programs provide these services, they are in essence acknowledging and affirming that students’ significant relationships have an impact on their general life satisfaction and thus on their academic satisfaction.

Implications for Veterinary Students

Veterinary students, as a group, are ambitious, intelligent, motivated, and caring people. Based on the response to this research and the time the respondents took, not only to answer the questions but to comment on them too, they are interested in addressing issues of stress, coping, and relationships within their training programs. Clearly, stress has a significant impact, either directly or indirectly, upon their significant relationships, their academic satisfaction, and their life satisfaction in general. Veterinary students, busy as they are, need to take the initiative to speak up about their needs and remind their faculties that life outside veterinary school does exist and is an important factor in determining how well students can concentrate on their studies. They can also provide support and encouragement for each other as student colleagues to seek assistance when it is needed and not be ashamed of doing so, recognizing that personal and relationship well-being is important to being both a good student and a quality practitioner. They can request that the faculty provide mentorship and provide mentoring as well to others who are considering pursuing veterinary training, so that future generations of trainees and their significant others have reasonable expectations about what the training process entails, and its impact upon relationships.

Implications for Marriage and Family Therapists

Clearly one of the most important implications of this study for marriage and family therapists is the importance of relationship satisfaction on reducing perceived stress and improving overall quality of life. This is not a new finding but it lends support to past research that has suggested that people rarely categorize their lives such that what goes on in one aspect of their life has little to no impact on the other aspects of it. The power of strong personal relationships to buffer other stresses in our lives is incredible. Marriage and family therapists understand this and are specifically trained to help others improve and enhance their primary relationships such that they can provide this level of support. In addition, because of our understanding of the multiple layers of systems, marriage and family therapists are in a position to understand the interface of personal lives and professional training, and can assist both training programs and individuals to integrate these two very important pieces successfully. Marriage and Family therapists know how to help others learn to communicate effectively, and

can encourage the development of relational skills that help others strengthen their relationships in the face of stress and adversity.

The traditional role of Marriage and Family Therapists as a helping profession has been to assist others in resolving problems within their significant personal relationships. As the profession has matured, it has been realized that the systemic perspective also applies to other types of relationships, and the skills of MFTs have begun to be utilized in a multitude of other settings. For instance, McDaniel, Hepworth, and Doherty (1992) promoted the biopsychosocial model of Medical Family Therapy, utilizing systemic principals in medical settings to help individuals and families cope with the relational issues surrounding the medical treatment of chronic and terminal illnesses. In addition, Hafen, White, Rush, Reisbig, & McDaniel (in press) have explored the possibilities for collaboration between the fields of MFT and veterinary medicine through supporting the learning and development of effective client communication skills, acknowledgment of the importance of pets to individuals and family systems, and enhancing veterinarian personal and relational well-being. Their experience, and further research within the field of Medical Family Therapy, suggests that MFTs are already finding a role within veterinary medicine assisting clients, students, and professionals to improve both their personal and professional relationships.

Conclusion

Though there is much yet to be learned about how the stresses of veterinary training interact with and impact upon significant intimate relationships, this research highlights the significant relationship between stress, relationship satisfaction, self-esteem, academic satisfaction, and life satisfaction in general. There is a complex relationship among these very important aspects of veterinary student life. This encourages support for continued collaboration between veterinary training programs, veterinary students, and marriage and family therapists in order to better understand and support students and their significant relationships, as they engage in the process of veterinary training. Through this collaborative effort, stresses can be more clearly delineated and successfully managed, such that trainees can become truly successful, in both their personal and professional lives.

References

- 9to5 (n.d.). *Women in the workforce: 9to5 profile of working women 2004*. Retrieved November 5, 2005, from <http://www.9to5.org/media/>
- Adsett, C.A. (1968). Psychological health of medical students in relation to the medical education process. *Journal of Medical Education, 43*, 728-734.
- Alexander, D.A., & Haldane, J.D. (1979). Medical education: a student perspective. *Medical Education, 13*, 336-341.
- American Psychological Association. (1994). *Diagnostic and statistical manual* (4th Ed.). Washington, D.C., Author.
- American Veterinary Medical Association. (n.d.). *Veterinary colleges accredited by the AVMA*. Retrieved November 4, 2005, from http://www.avma.org/education/cvea/colleges_accredited/allcolleges.asp
- Andrews, F.M. & Withey, S.B. (1976). *Social indicators of well-being: Americans' perceptions of life quality*. New York: Plenum.
- Association of American Veterinary Medical Colleges. (2002-2003). *Comparative data report*. Washington, D.C.: Author.
- Bartnick, L.W., Kappelman, M.M., Berger, J.H., & Sigman, B. (1985). The value of the California Psychological Inventory in predicting medical students' career choice. *Medical Education, 19*, 143-147.
- Beach, S.R.H., Martin, J.K., Blum, T.C., & Roman, P.M. (1993). Effects of marital and co-worker relationships on negative affect: Testing the central role of marriage. *American Journal of Family Therapy, 21*, 313-323.

- Beck, A.T., Ward, C.H., Mendelson, M., Mock, J., Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, 4, 561-571.
- Becker, M.J. (1995). The relationships between coping strategies, gender-related traits, gender and academic attributes, and distress in first-year medical students. *Dissertation Abstracts International (DAI)*, 56, 1706.
- Berman, E.M. (1979). The physician's marriage, joys and sorrows: Life transition points. *Facets*, Winter, 25-28.
- Berney, M. T. (1998). An investigation of personality hardiness and coping styles are related to stress coping of veterinary medical students at Washington State University. *DAI*, 58(8-A), 2997.
- Bird, H.W. (1979). The physician's marriage: joys and sorrows: Spotting the danger signals. *Facets*, Summer, 18-20.
- Bittman, M., England, P., Sayer, L., Folbre, N., & Matheson, G. (2003). When does gender trump money? Bargaining and time in household work. *American Journal of Sociology*, 109, 186-214.
- Bjorksten, O., Sutherland, S., Miller, C., & Stewart, T. (1983). Identification of medical student problems and comparison with those of other students. *Journal of Medical Education*, 58, 759-767.
- Bolger, N., DeLongis, A., Kessler, R.C., & Wethington, E. (1989). The contagion of stress across multiple roles. *Journal of Marriage and the Family*, 51, 175-183.
- Bradburn, N.M. (1969). *The structure of psychological well-being*. Chicago: Aldine.
- Bramness, J.G., Fixdal, T.C., & Vaglum, P. (1991). Effect of medical school stress on the mental health of medical students in early and late clinical curriculum. *Acta Psychiatrica Scandinavica*, 84, 340-345.

- Brown, G.W., Harris, T.O., & Hepworth, C. (1995). Loss, humiliation and entrapment among women developing depression: A patient and non-patient comparison. *Psychological Medicine, 25*, 7-21.
- Brown, J.P., & Silverman, J.D. (1999). The current and future market for veterinarians and veterinary medical services in the United States: Executive summary. *Journal of the American Veterinary Medical Association (JAVMA), 215*, 161-183.
- Brown, S.L. (1994). Factor structure of a brief version of the Ways of Coping (WOC) Questionnaire: A study with veterinary medicine students. *Measurement and Evaluation in Counseling and Development, 27*, 308-315.
- Bruhn, J.G., & duPlessis, A. (1966). Wives of medical students: Their attitudes and adjustments. *Journal of Medical Education, 41*, 381-385.
- Burr, W.R. (1973). *Theory construction and the sociology of the family*. New York: Wiley.
- Butler, C., Williams, S., & Kole, S. (2002). Perceptions of fourth-year veterinary students regarding emotional support of clients in veterinary practice in the veterinary college curriculum. *JAVMA, 221*, 360-363.
- Calahan, C.A. (1997). Internal consistency, reliability, and concurrent validity of the Kansas Marital Satisfaction Scale and the Quality Marriage Index. *Psychological Reports, 80*, 49-50.
- Carmel, S., & Bernstein, J. (1987). Perceptions of medical school stressors: their relationship to age, year of study, and trait anxiety. *Journal of Human Stress, 13*, 39-44.
- Carver, C.S., Scheier, M.F., & Weintraub, J.K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*, 267-283.
- Chang, E.C. (1998). Does dispositional optimism moderate the relation between perceived stress and psychological well-being?: A preliminary investigation. *Personality and Individual Differences, 25*, 233-240.

- Chen, C.H., Tseng, Y.F., Chou, F.H., & Wang, S.Y. (2000). Effects of support group intervention in postnatally depressed women: A controlled study in Taiwan. *Journal of Psychosomatic Research*, 49, 395-399.
- Christian, J.L., O'Leary, K.D., & Avery, S. (1993). *The impact of negative events in marriage and depression*. Unpublished manuscript, the University at Stony Brook, Stony Brook, NY.
- Clark, D.C., & Zeldow, P.B. (1988). Vicissitudes of depressed mood during four years of medical school. *Journal of the American Medical Association (JAMA)*, 260, 2521-2528.
- Coburn, D. & Jovaisas, A.V. (1975). Perceived sources of stress among first year medical students. *Journal of Medical Education*, 50, 589-595.
- Cohen, B.H. (2001). *Explaining psychological statistics* (2nd Ed.). New York: Wiley & Sons.
- Cohen, J., & Cohen, P. (1975). *Applied regression/ correlation analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 385-396.
- Cohen, S., Kessler, R.C., & Gordon, L.U. (1995). Strategies for measuring stress in studies of psychiatric and physical disorders. In S. Cohen, R.C. Kessler, & L.U. Gordon (Eds.) *Measuring stress: A guide for health and social scientists* (pp. 3-26). New York: Oxford University.
- Cohen, S., & Williamson, G.M. (1988). Perceived stress in a probability sample of the United States. In S. Oskamp & S. Spacapan (Eds.) *The social psychology of health* (pp. 31-67). Thousand Oaks, CA: Sage.
- College of Veterinary Medicine and Biological Sciences, *Description of PVM Program* (2005). Retrieved November 9, 2005, from <http://www.cvmbs.colostate.edu/cvmbs/descrip.html>

- Collins, H., & Foote, D. (2005). Managing stress in veterinary students. *Journal of Veterinary Medical Education*, 32, 170-172.
- Coombs, R.H., & Fawzy, I.F. (1982). The effect of marital status on stress in medical school. *American Journal of Psychiatry*, 139, 1490-1493.
- Coopersmith, S. (1967). *The antecedents of self-esteem*. Palo Alto, CA: Consulting Psychologists.
- Crandal, R. (1973). The measurement of self-esteem and related constructs. In J.P. Robinson & P.R. Shaver (Eds), *Measures of social psychological attitudes* (Rev. Ed.) (pp. 80-82). Ann Arbor: ISR.
- Crane, D.R., & Mead, D.E. (1980). The Marital Status Inventory: Some preliminary data on an instrument to measure marital dissolution potential. *American Journal of Marital Therapy*, 8(3), 31-35.
- Crane, D.R., Middleton, K.C., & Bean, R.A. (2000). Establishing criterion scores for the Kansas Marital Satisfaction Scale and the Revised Dyadic Adjustment Scale. *American Journal of Family Therapy*, 28, 53-60.
- Cron, W.L., Slocum, J.V., Goodnight, D.B., & Volk, J.O. (1999). Impact of management practices and business behaviors on small animal veterinarians' incomes (Brakke-Bayer study, 1998-1999). *JAVMA Executive Summary*.
- Crowne, D.P. & Marlowe, D. (1964). *The approval motive*. New York: Wiley.
- Davidson, V.M. (1978). Coping styles of women medical students. *Journal of Medical Education*, 53, 902-907.
- Day, A.L. (1997). Conceptualizing work and family conflict using an inter-role perspective: The importance of time, strain, and behavior. *DAI*, 58(1-B), 445.

- Day, A.L., & Jreige, S. (2002). Examining Type A behavior pattern to explain the relationships between job stressors and psychosocial outcomes. *Journal of Occupational Health Psychology, 7*, 109-120.
- Dennis, K.S. (2000). Faculty behavior and other key factors in student adjustment to medical school. *Advances in Health Sciences Education, 5*, 55-69.
- Derdeyn, A.P. (1979). The physician's work and marriage. *International Journal of Psychiatry in Medicine, 9*, 297-306.
- Diener, E., Emmons, R.A., Larsen, R.J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*, 71-75.
- Doherty, W.J., & Burge, S.K. (1989). Divorce among physicians: comparisons with other occupational groups. *JAMA, 261*, 2374-85.
- Dommeyer, C.J. & Moriarty, E. (2000). Comparing two forms of an e-mail survey: Embedded vs. attached. *International Journal of Market Research, 42*, 39-50.
- Eagle, J.R., & Smith, B.M. (1968). Stresses of the medical school wife. *Journal of Medical Education, 43*, 840-845.
- Edwards, M.T., & Zimet, C.N. (1976). Problems and concerns among medical students – 1975. *Journal of Medical Education, 51*, 619-625.
- Ellett, E.V. (1994). The relationship between sex role traits and attitudes and marital satisfaction for women in graduate school. *DAI, 55*(6-B), 2385.
- Enns, M.W., Cox, B.J., Sareen, J., & Freeman, P. (2001). Adaptive and maladaptive perfectionism in medical students: A longitudinal investigation. *Medical Education, 35*, 1034-1042.
- Erikson, E.H. (1965). Eight ages of man. *In Childhood and society* (2nd Ed.) (pp. 281-297). New York: Norton.

- Eron, L.D. (1955). Effect of medical education on medical students' attitudes. *Journal of Medical Education, 30*, 559-566.
- Feminist Majority Foundation. (2004). *Empowering Women in Medicine*. Retrieved March 25, 2004 from http://www.feminist.org/research/medicine/ewm_your.html
- Firth, J. (1986). Levels and sources of stress in medical students. *British Medical Journal, 292*, 1177-1180.
- Firth-Cozens, J. (1989). Stress in medical undergraduates and house officers. *British Journal of Hospital Medicine, 41*, 161-164.
- Firth-Cozens, J. (1990). Source of stress in women junior house officers. *British Medical Journal, 301*, 89-91.
- Firth-Cozens, J. (1994a). Stress in doctors: not so simple solutions. *British Journal of Hospital Medicine, 52*, 435-436.
- Firth-Cozens, J. (1994b). The five years after qualification. *British Medical Journal, 309*, 1524-1525.
- Firth-Cozens, J. (1997). Predicting stress in general practitioners: 10 year follow-up postal survey. *British Medical Journal, 315*, 34-35.
- Firth-Cozens, J. (2001b). Medical student stress. *Medical Education, 35*, 6-7.
- Firth-Cozens, J., Lema, V.C., & Firth, R.A. (1999). Specialty choice, stress and personality: their relationships over time. *Hospital Medicine, 60*, 751-755.
- Firth-Cozens, J., Moss, F., Rayner, C., & Paice, ?. (2000). The effect of 1-year rotations on stress in preregistration house officers. *Hospital Medicine, 61*, 859-860.
- Folkman, S. & Lazarus, R.S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior, 21*, 219-239.

- Folkman, S. & Lazarus, R.S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology, 48*, 150-170.
- Folkman, S. & Moskowitz, J.T. (2004). Coping: Pitfalls and promise. *Annual Review of Psychology, 55*, 745-774.
- Fordyce, M.W. (1978). *Prospectus: The self-description inventory*. Unpublished paper, Edison Community College, Ft. Myers, FL.
- Gabbard, G.O., Menninger, R.W., & Coyne, L. (1987). Sources of conflict in the medical marriage. *American Journal of Psychiatry, 144*, 567-572.
- Gaensbauer, T.J. & Mizner, G.L. (1980). Developmental stresses in medical education. *Psychiatry Journal for the Study of Interpersonal Processes, 43*, 60-70.
- Garson, G.D. (2006). *Statnotes: Topics in multivariate analysis*. Retrieved July 3, 2006, from North Carolina State University College of Humanities & Social Sciences (CHASS) Website: <http://www2.chass.ncsu.edu/garson/pa765/path.htm>
- Gelberg, S., & Gelberg H. (2005). Stress management interventions for veterinary students. *Journal of Veterinary Medical Education, 32*, 173-181.
- Gerson, M.S. (1998). The relationship between hardiness, coping skills, and stress in graduate students. *DAI, 59*, 3056.
- Gerstein, L.H., & Russell, N. (1990). The experience of medical school: A major life crisis. *College Student Journal, 24*, 128-138.
- Gliner, J.A. & Morgan, G.A. (2000). *Research methods in applied settings: An integrated approach to design and analysis*. Mahwah, NJ: Lawrence Erlbaum.
- Gottheil, E., Thornton, C.C., Conly, S.S., & Cornelison, F.S. (1969). Stress, satisfaction, and performance: transition from university to medical college. *Journal of Medical Education, 44*, 270-77.

- Gottman, J. (1999). *The marriage clinic: A scientifically based marital therapy*. New York: Norton.
- Grossman, H.Y., Salt, P., Nadelson, D., & Notman, M. (1987). Coping resources and health responses among men and women medical students. *Social Science and Medicine*, 25, 1057-1062.
- Grover, K.J., Paff-Bergen, L.A., Russell, C.S., & Schumm, W.R. (1984). The Kansas Marital Satisfaction Scale: A further brief report. *Psychological Reports*, 54, 629-630.
- Hafen, M., Reisbig, A.M.J., White, M.B., & Rush, B.R. (in press). Predictors of depression and anxiety in first year veterinary students: A preliminary report. *Journal of Veterinary Medical Education*.
- Hafen, M., White, M.B., Rush, B. R., Resibig, A.M.J., & McDaniel, K.Z. (in press). Family therapists and veterinary medical professionals: Opportunities for collaboration. *Journal of Marriage and the Family*.
- Hagborg, W.J. (1993). The Rosenberg Self-Esteem Scale and Harter's Self-Perception Profile for Adolescents: A concurrent validity study. *Psychology in the Schools*, 30, 132-136.
- Harrington-Hill, R. (1991). Levels of masculinity and femininity and the resolution of Erikson's psychological crises as it relates to marital satisfaction (psychological crises). *DAI*, 53(04-B), 2083.
- Harter, S. (1988). *Manual for the Self-Perception Profile for Adolescents*. Denver: University of Denver.
- Heath, D.H. (1965). *Explorations of maturity*. East Norwalk, CT: Appleton-Century-Crofts.
- Heins, M., Fahey, S.N., & Leiden, L.I. (1984). Perceived stress in medical, law, and graduate students. *Journal of Medical Education*, 59, 169-179.

- Hewitt, P.L., Flett, G.L., & Mosher, S.W. (1992). The Perceived Stress Scale: Factor structure and relation to depression symptoms in a psychiatric sample. *Journal of Psychopathology and Behavioral Assessment, 14*, 247-257.
- Hill, R. (1949). *Families under stress*. New York: Harper & Brothers.
- Hill, R. & Joy, C. (1979). *Conceptualizing and operationalizing category systems for phasing of family development*. Unpublished manuscript, University of Minnesota.
- Hoare, C.H. (2002). *Erikson on development in adulthood: New insights from the unpublished papers*. New York: Oxford University.
- Hood, R.R. (1990). Graduate school and marital adjustment: Attributions of students and spouses. *DAI, 52*(3-B), 1777.
- Horowitz, A.V., McLaughlin, J., & White, H.R. (1998). How the negative and positive aspects of partner relationships affect the mental health of young married people. *Journal of Health & Social Behavior, 39*, 124-136.
- Houser, R., Konstam, V., & Ham, M. (1990). Coping and marital satisfaction in dual-career couples: early stage dual-career couples – wives as college students. *Journal of College Student Development, 31*, 325-329.
- Hunt, R.A. (1978). The effect of item weighting on the Locke-Wallace Marital Adjustment Scale. *Journal of Marriage and the Family, 40*, 249-256.
- Jeong, G.J., Bollman, S.R., & Schumm, W.R. (1992). Self-reported marital instability as correlated with the Kansas Marital Satisfaction Scale for a sample of Midwestern wives. *Psychological Reports, 70*, 243-246.
- Johnson, C.A., Johnson, B.E., Liese, B.S. (1991). Dual-doctor marriages: The British experience. *Journal of the American Medical Women's Association, 46*, 155-59 & 163.

Kansas University Medical Center (2005). *KU School of Medicine, The University of Kansas, Curriculum*. Retrieved November 7, 2005, from <http://www.kumc.edu/som/curriculum.html>

Kaplan, H.B. & Pokorney, A.D. (1969). Self-derogation and psychosocial adjustment. *Journal of Nervous and Mental Disease, 149*, 421-434.

Karambayya, R., & Reilly, A.H. (1992). Dual earner couples: Attitudes and actions in restructuring work for family. *Journal of Organizational Behavior, 13*, 585-601.

Kassebaum, D.G. & Cutler, E.R. (1998). On the culture of student abuse in medical school. *Academic Medicine, 73*, 1149-1158.

Katz, J., Beach, S.R.H., Smith, D.A., Myers, L.B. (1997). Personality and the marital context: The case for interactive conceptualizations of needs for spousal support. In G.R. Pierce, B. Lakey, I.G. Sarason, & B.R. Sarason (Eds.), *Sourcebook of social support and personality* (pp. 257-278). New York: Plenum.

Katz, J., Monnier, J., Libet, J., Shaw, D., & Beach, S.R.H. (2000b). Individual and crossover effects of stress on adjustment in medical student marriages. *Journal of Marital and Family Therapy, 26*, 341-351.

Kelly, G.A. (1955). *The psychology of personal constructs. I. A theory of personality. II. Clinical diagnosis and psychotherapy*. Oxford, England: Norton & Co.

Kelley, D.L. (1988). Understanding relational expectations and perceptions of relational satisfaction in marital relationships. *DAI, 50*(1-A), 21.

Kelloway, E.K., & Barling, J. (1994). Stress, control, well-being, and marital functioning: A causal correlational analysis. In G.P. Keita, & J.J. Hurrell (Eds.), *Job Stress in a changing workforce: Investigating gender, diversity, and family issues* (pp. 241-251). Washington, D.C.: American Psychological Association.

Kent-Arce, S. E. (1991). The development of the veterinary medical stressors inventory: The identification of perceived stressors and their relationship to personality traits and

- selected demographic characteristics among veterinary medical students (stress). *DAI*, 52(11-A), 3864.
- Khanna, J.L. & Khanna, P. (1990). Stress as experienced by medical students. *College Student Journal*, 24, 20-26.
- Kogan, L.R., McConnell, S.L., & Schoenfeld-Tacher, R. (2005). Veterinary students and non-academic stressors. *Journal of Veterinary Medical Education*, 32, 193-200.
- Kreger, D.W. (1995). Self-esteem, stress, and depression among graduate students. *Psychological Reports*, 76, 345-346.
- Kutcher, S.P. (1984). Coping with the stresses of medical education. *Canadian Medical Association Journal*, 130, 373-374 & 381.
- Larsen, R.J. (1983). *Manual for the Affect Intensity Measure*. Unpublished manuscript, University of Illinois at Urbana-Champaign.
- Lawton, M.P. (1975). The Philadelphia Geriatric Center Morale Scale: A revision. *Journal of Gerontology*, 30, 58-59.
- Lazarus, R.S. (1966). *Psychological stress and the coping process*. New York: McGraw-Hill.
- Lazarus, R.S. (1990). Theory-based stress management. *Psychological Inquiry*, 1, 3-13.
- Lazarus, R.S. (1993). Why we should think of stress as a subset of emotion. In L. Goldberger & S. Breznitz (Eds.), *Handbook of stress: Theoretical and clinical aspects* (2nd Ed.) (pp. 21-39). New York: Free Press.
- Lazarus, R.S. (1995). Psychological stress in the workplace. In R. Crandall & P.L. Perrewe (Eds.), *Occupational stress: A handbook. Series in health psychology and behavioral medicine* (pp. 3-14). Washington, D.C.: American Psychological Association.
- Lee, J. & Graham, A.V. (2001). Students' perception of medical school stress and their evaluation of a wellness activity. *Medical Education*, 35, 652-659.

- Leiter, M.P., & Durup, M.J. (1996). Work, home, and in-between: a longitudinal study of spillover. *The Journal of Applied Behavioral Science*, 32, 29-47.
- Levenstein, S., Prantera, C., Varvo, V., Scribano, M.L., Berto, E., Luzi, C., & Andreoli, A. (1993). Development of the Perceived Stress Questionnaire: A new tool for psychosomatic research. *Journal of Psychosomatic Research*, 37, 19-32.
- Levinson, D.J. (1978). *Seasons of a man's life*. New York: Knopf.
- Linn, B.S., & Zeppa, R. (1984). Stress in junior medical students: Relationship to personality and performance. *Journal of Medical Education*, 59, 7-12.
- Linn, L.S., Yager, J., Cope, D., & Leake, B. (1985). Health status, job satisfaction, job stress, and life satisfaction among academic and clinical faculty. *JAMA*, 254, 2775-2782.
- Lloyd, C., & Gartrell, N.K. (1983). A further assessment of medical student stress. *Journal of Medical Education*, 58, 964-967.
- Marchand, W.R., Palmer, C.A., Gutmann, L., & Brogan, W.C. (1985). Medical student impairment: A review of the literature. *The West Virginia Medical Journal*, 81, 244-248.
- Marcia, J.E. (2002). Identity and psychosocial development in adulthood. *Identity: An International Journal of Theory and Research*, 2, 7-28.
- Maslow, A.H. (1949). The expressive component of behavior. *Psychological Review*, 56, 261-272.
- McCarthy, J.D. & Hoge, D.R. (1982). Analysis of age effects in longitudinal studies of adolescent self-esteem. *Developmental Psychology*, 18, 372-379.
- McCubbin, H., Boss, P., Wilson, L., & Lester, G. (1980). Developing family invulnerability to stress: Coping strategies wives employ in managing family separation. In J. Trost (Ed.) *The family in change* (pages unknown). Sweden: Vasteras Librarie Internationale.

- McCubbin, H.I. & Patterson, J.M. (1983). Family transitions: Adaptation to stress. In H.I. McCubbin (Ed.) & C.R. Figley (Ed.), *Stress and the family I: Coping with normative transitions* (pp. 5-25). New York: Brunner/ Mazel.
- McCue, J.D. (1985). The distress of internship: causes and prevention. *The New England Journal of Medicine*, 312, 449-452.
- McDaniel, S.H., Hepworth, J., & Doherty, W.J. (1992). *Medical family therapy: A biopsychosocial approach to families with health problems*. New York: BasicBooks.
- McFarland, E.G. (1980). Stress and the medical student. *The Journal of the Kentucky Medical Association*, 78, 334-337.
- McLennan, M.W., & Sutton, R.H. (2005). Stress in veterinary science students: A study at the University of Queensland. *Journal of Veterinary Medical Education*, 32, 213-218.
- Melbo, M.M. (1981). Stressors, and their relationship to selected psychological, situational, and demographic variables for veterinary medical students. *DAI*, 42(6-A), 2577.
- Menaghan, E. (1982). Measuring coping effectiveness: A panel analysis of marital problems and coping efforts. *Journal of Health and Social Behavior*, 23, 220-234.
- Merrill, J.M., Laux, L.F., Thornby, J.I., Vallbona, C. (1989). Depression in medical students. *JAMA*, 281, 2065-2066.
- Metz, B.A. (1991). Toward an understanding of the reciprocal relationship between work and family (work family relationships). *DAI*, 53(3-A), 722.
- Microsoft (1999). *Excel*. Author.
- Mimura, C & Griffiths, P. (2004). A Japanese version of the Perceived Stress Scale: Translation and preliminary test. *International Journal Nursing Studies*, 41, 379-385.
- Mitchell, R.E., Matthews, J.R., Grandy, T.G., & Lupo, J.V. (1983). The question of stress among first year medical students. *Journal of Medical Education*, 58, 367-371.

- Mitchell, S.E., Newell, G.K., & Schumm, W.R. (1983). Test-retest reliability of the Kansas Marital Satisfaction Scale. *Psychological Reports, 53*, 545-546.
- Mosley, T.H., Perrin, S.G., Neral, S.M., Dubbert, P.M., Grothues, C.A., & Pinto, B.M. (1994). Stress, coping, and well-being among third year medical students. *Academic Medicine, 69*, 765-767.
- Murphy, J.M., Nadelson, C.C., & Notman, M.T. (1984). Factors influencing first-year medical students' perceptions of stress. *Journal of Human Stress, 10*, 165-173.
- Murphy, L.B. (1960). Coping devices and defense mechanisms in relation to autonomous ego functions. *Bulletin of the Menninger Clinic, 24*, 144-153.
- Nelson, N.G., Dell'Oliver, C., Koch, C., & Buckler, R. (2001). Stress, coping, and success among graduate students in clinical psychology. *Psychological Reports, 88*, 759-767.
- Neugarten, B.L. (1979). Time, age, and the life cycle. *American Journal of Psychiatry, 136*, 887-894.
- Neugarten, B.L., Havighurst, R.J., & Tobin, S.S. (1961). The measurement of life satisfaction. *Journal of Gerontology, 16*, 134-143.
- Niemi, P.M & Vainiomaeki, P.T. (1991). Medical students' academic distress, coping, and achievement strategies during the preclinical years. *Teaching and Learning in Medicine, 11*, 125-134.
- Norton, R. (1983). Measuring marital quality: A critical look at the dependent variable. *Journal of Marriage and the Family, 45*, 141-151.
- Notman, M.T., Salt, P., & Nadelson, C.C. (1984). Stress and adaptation in medical students: who is most vulnerable? *Comprehensive Psychiatry, 25*, 355-366.
- Okun, M.A., Kardash, C.A., Stock, W.A., Sandler, I.N., & Baumann, D.J. (1986). Measuring perceptions of the quality of academic life among college students. *Journal of College Student Personnel, 27*, 447-451.

- Okun, M.A., Sandler, I.N., & Baumann, D.J. (1988). Buffer and booster effects as event-support transactions. *American Journal of Community Psychology, 16*, 435-449.
- Paget, J. (1902). What becomes of medical students? In J. Paget (Ed.), *Selected essays and addresses by Sir James Paget* (pp. 27-32). London: Longmans, Green, & Co.
- Paice, E., Rutter, H., Wetherall, M., Winder, B., & McManus, I.G. (2002). Stressful incidents, stress and coping strategies in the pre-registration house officer year. *Medical Education, 36*, 56-65.
- Park, C.L. & Adler, N.E. (2003). Coping style as a predictor of health and well-being across the first year of medical school. *Health Psychology, 22*, 627-631.
- Parkes, K.R. (1984). Locus of control, cognitive appraisal, and coping in stressful episodes. *Journal of Personality and Social Psychology, 46*, 655-668.
- Pavot, W. & Diener, E. (1993). Review of the Satisfaction With Life Scale. *Psychological Assessment, 5*, 164-172.
- Pavot, W.G., Diener, E., Colvin, C.R. & Sandvik E. (1991). Further validation of the Satisfaction With Life Scale: Evidence for the cross-method convergence of well-being measures. *Journal of Personality Assessment, 5*, 149-161.
- Pearlin, L.I. & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior, 19*, 2-21.
- Perlow, A.D., & Mullins, S.C. (1976). Marital satisfaction as perceived by the medical student's spouse. *Journal of Medical Education, 51*, 726-734.
- Perrone, K.M., & Worthington, E.L. (2001). Factors influencing ratings of marital quality by individuals within dual-career marriages: A conceptual model. *Journal of Counseling Psychology, 48*, 3-9.
- Phillips-Miller, D.L., Campbell, N.J., & Morrison, C. R. (2000). Work and family: Satisfaction, stress, and spousal support. *Journal of Employment Counseling, 37*, 16-30.

- Press, J.E., & Townsley, E. (1998). Wives' and husbands' housework reporting: Gender, class, and social desirability. *Gender and Society, 12*, 188-218.
- Ptacek, J.T., & Dodge, K.L. (1995). Coping strategies and relationship satisfaction in couples. *Personality and Social Psychology Bulletin, 21*, 76-84.
- Pyskoty, C.F., Richman, J.A., & Flaherty, J.A. (1990). Psychosocial assets and mental health of minority medical students. *Academic Medicine, 65*, 581-585.
- Radcliffe, C. & Lester, H. (2003). Perceived stress during undergraduate medical training: A qualitative study. *Medical Education, 37*, 32-38.
- Robinson, L.M. (1994). Effect of marital partners' coping strategies on each other: Implications for an integrated model of stress regulation. *DAI, 54*, 5932.
- Roger, D., Jarvis, G., & Najarian, B. (1993). Detachment and coping: The construction and validation of a new scale for measuring coping strategies. *Personality and Individual Differences, 15*, 619-626.
- Rosenberg, M. (1956). Psychological depression and educational attitudes. *Student Medicine, 5*, 5-20.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Rosow, I., & Rose, K.D. (1972). Divorce among doctors. *Journal of Marriage and the Family, 34*, 587-598.
- Rust, J., Bennun, I.S., Crowe, M., & Golombok, S. (1986). The Golombok Rust Inventory of Marital State (GRIMS). *Sexual and Marital Therapy, 1*, 55-60.
- Rust, J., Bennun, I.S., Crowe, M., & Golombok, S. (1990). The GRIMS: A psychometric instrument for the assessment of marital discord. *Journal of Family Therapy, 12*, 45-57.
- Sacks, M.H., Frosch, W.A., Kesselman, M., & Parker, L. (1980). Psychiatric problems in third-year medical students. *American Journal of Psychiatry, 137*, 822-825.

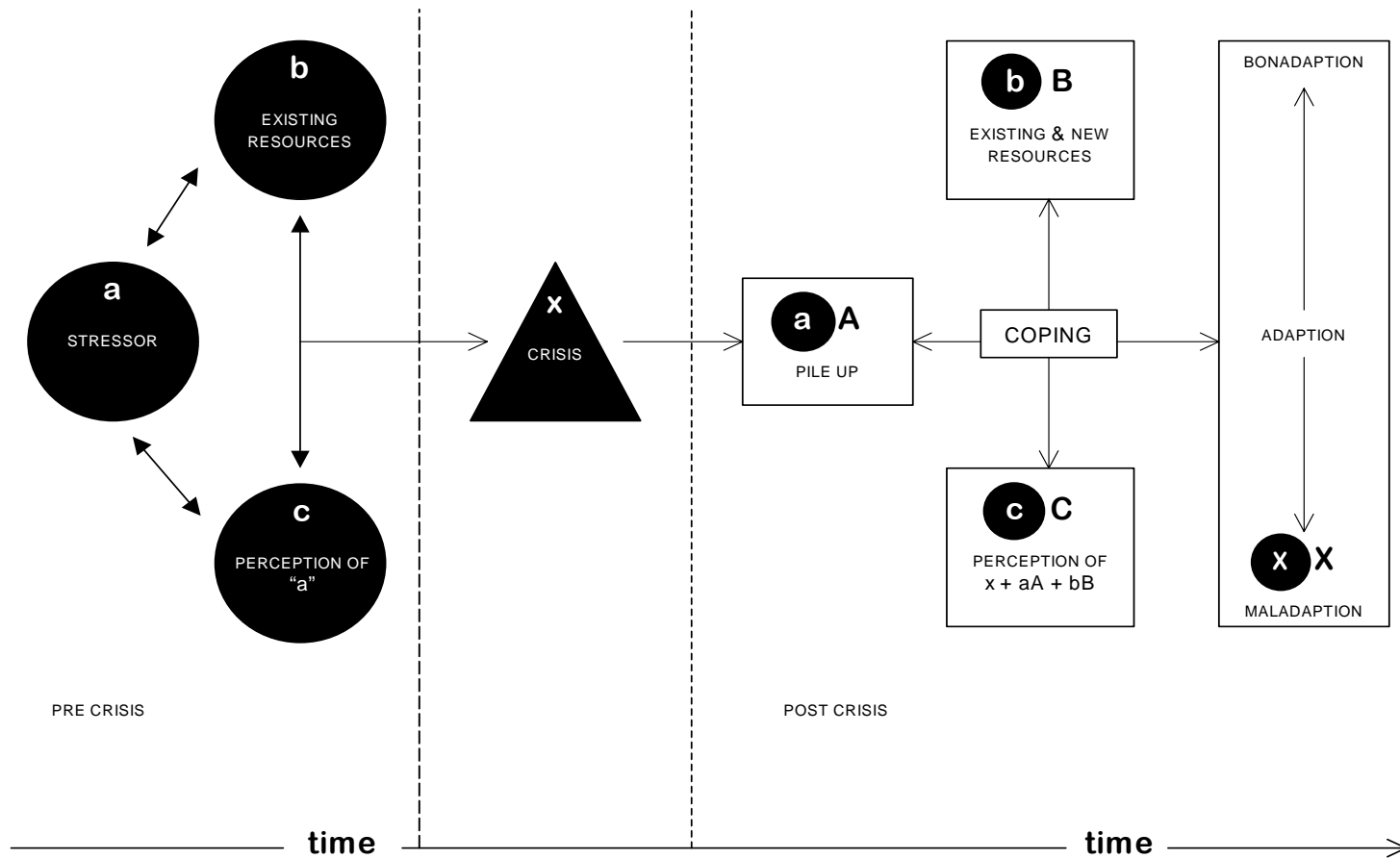
- Schaefer, D.R. & Dillman, D.A. (1998). Development of a standard E-mail methodology: Results of an experiment. *Public Opinion Quarterly*, 62, 378-397.
- Scheinkman, M. (1988). Graduate student marriages: An organizational/ interactional view. *Family Process*, 27, 351-368.
- Schumm, W.R., Bollman, S.R., & Jurich, A.P. (2000). *The Kansas Marital Satisfaction Scale: Current evidence for the reliability and validity of a brief measure of overall marital quality*. Unpublished manuscript, Kansas State University, Manhattan.
- Schumm, W.R. Bollman, S.R., & Jurich, A.P. (1997). Gender and marital satisfaction: A replication using a seven-point item response version of the Kansas Marital Satisfaction Scale. *Psychological Reports*, 81, 1004-1006.
- Schumm, W.R., Anderson, S.A., Benigas, J.R., McCutchen, M.B., Griffin, C.L., Morris, J.E., & Race, G.S. (1985). Criterion-related validity of the Kansas Marital Satisfaction Scale. *Psychological Reports*, 56, 719-722.
- Schumm, W.R., Scanlon, E.D., Crow, C.L., Green, D.M., & Buckler, D.L. (1983b). Characteristics of the Kansas Marital Satisfaction Scale in a sample of 79 married couples. *Psychological Reports*, 53, 583-588.
- Schwartz, A.H., Swartzburg, M., Lieb, J., & Slaby, A.E. (1978). Medical school and the process of disillusionment. *Medical Education*, 12, 182-185.
- Schwartz, A.J., Black, E.R., Goldstein, M.G., Jozefowicz, R.F., & Emmings, F.G. (1987). Levels and causes of stress among residents. *Journal of Medical Education*, 62, 744-754.
- Seifert, K.L., Hoffnung, R.J., & Hoffnung, M. (1997). *Lifespan development*. Boston: Houghton Mifflin.
- Shahani, C., Dipboye, R.L., & Phillips, A.P. (1990). Global self-esteem as a correlate of work-related attitudes: A question of dimensionality. *Journal of Personality Assessment*, 54, 276-288.

- Sheehan, K.B. (2001). E-mail survey response rates: A review. *Journal of Computer Mediated Communication*, 6, n.p.
- Silber, E. & Tippett, J.S. (1965). Self-esteem: Clinical assessment and measurement validation. *Psychological Reports*, 16, 1017-1071.
- Sinacore, A.L., & Akcali, F.O. (2000). Men in families: Job satisfaction and self-esteem. *Journal of Career Development*, 27, 1-13.
- Singleton, A., & Maher, J. (2004). The “new man” is in the house: Young men, social change, and housework. *Journal of Men’s Studies*, 12, 227-240.
- Slater, M.R. & Slater, M. (2000). Women in veterinary medicine. *JAVMA*, 217, 472-476.
- Smith, M.F., Andrasik, F., & Quinn, S.J. (1988). Stressors and psychological symptoms of family practice residents and spouses. *Journal of Medical Education*, 63, 397-405.
- Snyder, D.K. & Mangrum, L.F. (1996). Approaches to prediction: Correlation, regression, and discriminant analysis. In D.H. Sprenkle (Ed.) and S.M. Moon (Ed.), *Research methods in family therapy* (pp. 307-335). New York: Guilford Press.
- South, S.J. (1996). Do you need to shop around? Age at marriage, spousal alternatives, and marital dissolution. *Journal of Family Issues*, 16, 432-449.
- Spanier, G.B. (1976). Measuring dyadic adjustment: new scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family*, 38, 15-28.
- Spiro, J.H., Simpson, D.E., & Matteson, R.L. (1987). "Entering the adult world": Developmental issues in medical education. *Psychiatry: Journal for the Study of Interpersonal Processes*, 50, 256-266.
- Staats, S. (1983). Perceived sources of stress and happiness in married and single college students. *Psychological Reports*, 52, 179-184.
- Staats, S. & Partio, C. (1990). Predicting intent to get a college degree. *Journal of College Student Development*, 31, 245-249.

- Strand, E.B., Zaparanick, T.L., & Brace, J.J. (2005). Quality of life and stress factors for veterinary medical students. *Journal of Veterinary Medical Education*, 32, 182-192.
- SPSS 14.0 GraduatePack for Windows. (2006). Chicago: SPSS, Inc.
- Terman, L.M., Bутtenweiser, P., Ferguson, L.W., Johnson, W.B., & Wilson, D.P. (1938). *Psychological factors in marital happiness*. New York: McGraw Hill.
- Thomas, C.B. (1976). What becomes of medical students: the dark side. *The Johns Hopkins Medical Journal*, 138(5), 185-195.
- Tichenor, V. (2005). Maintaining men's dominance: Negotiating identity and power when she earns more. *Sex Roles*, 53, 191-205.
- Tyssen, R., Vaglum, P., Gronvold, N.T., & Ekeberg, O. (2000). The impact of job stress and working conditions on mental health problems among junior house officers: A nationwide Norwegian prospective cohort study. *Medical Education*, 34, 374-384.
- Tyssen, R., Vaglum, P., Gronvold, N.T., & Ekeberg, O. (2001a). Factors in medical school that predict postgraduate mental health problems in need of treatment. A nationwide and longitudinal study. *Medical Education*, 35, 110-120.
- Tyssen, R., Vaglum, P., Gronvold, N.T., & Ekeberg, O. (2001b). Suicidal ideation among medical students and young physicians: A nationwide and prospective study of prevalence and predictors. *Journal of Affective Disorders*, 64, 69-79.
- Tyssen, R. & Vaglum, P. (2002). Mental health problems among young doctors: An updated review of prospective studies. *Harvard Review of Psychiatry*, 10, 154-165.
- United States Department of Health & Human Services. (January, 2006). *The 2005 HHS Poverty Guidelines*. Retrieved May 28, 2006, from <http://aspe.hhs.gov/poverty/05poverty.shtml>
- United States Department of Labor & Bureau of Labor Statistics. (May, 2005). *Women in the labor force: A databook*. Washington, D.C.: Author.
- Virshup, B. (1981). *Coping in medical school*. Chapel Hill, NC: Health Sciences Consortium.

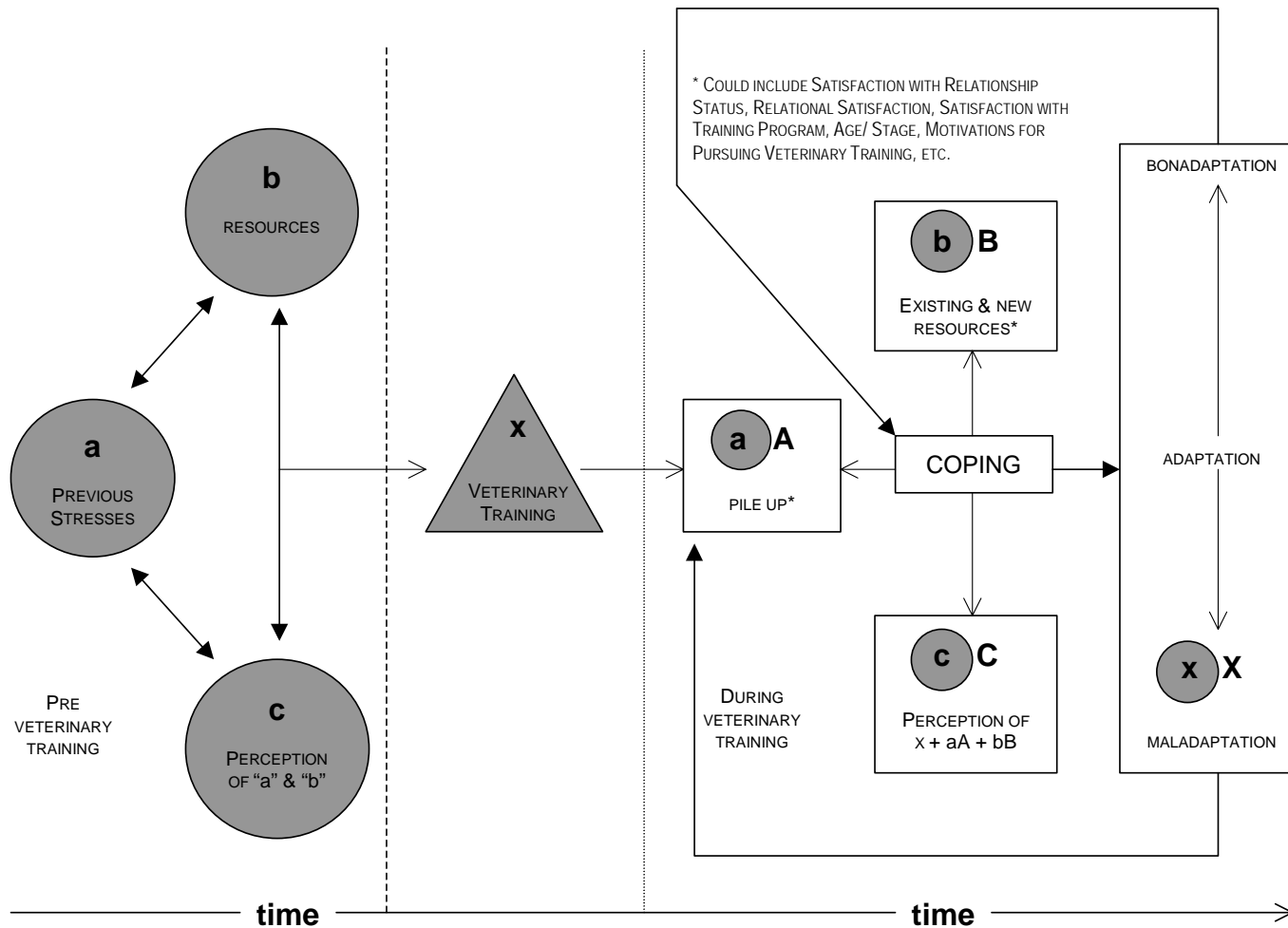
- Vitaliano, P.P., Maiuro, R.D., Russo, J., & Mitchell, E.S. (1989). Medical student distress: A longitudinal study. *Journal of Nervous and Mental Disease, 177*, 70-76.
- Waring, E.M. (1984). The measurement of marital intimacy. *Journal of Marital and Family Therapy, 10*, 185-192.
- Webster's New Collegiate Dictionary*. (1981). Springfield, MA: G. & C. Merriam.
- Wells, L.A. (1989). Common issues of late adolescence and young adulthood in medical students. *Adolescent Psychiatry, 16*, 228-245.
- Welsch, B. B. (1999). Gender differences in job stress, burnout and job satisfaction as mediated by coping style of veterinarians in private equine practice. *DAI, 59(9-B)*, 5118.
- Westman, M., & Etzion, D. (1995). Crossover of stress, strain, and resources from one spouse to another. *Journal of Organizational Behavior, 16*, 169-181.
- Wheatley, J.R. (2000). Psychological development in adult life. In D.S. Gupta & R.M. Gupta (Eds.), *Psychology for psychiatrists* (pp. 329-349). London: Whurr.
- Williams, S.M., Arnold, P.K., & Mills, J.N. (with Todd, S.A., Wilson, P.M., & Wright, C.M., 2005). Coping with stress: A survey of Murdoch University veterinary students. *Journal of Veterinary Medical Education, 32*, 201-212.
- Wimberley, D.L. (1991). Work satisfaction, work-related stress, marital/ family stress, and spousal support of married veterinarians. *DAI, 53(4-B)*, 2078.
- Wolf, T.M. (1994). Stress, coping and health: enhancing well-being during medical school. *Medical Education, 28*, 8-17.
- Wolf, T.M., Kissling, G.E., & Burgess, L.A. (1986). Lifestyle characteristics during medical school: a four-year cross-sectional study. *Psychological Reports, 59*, 179-189.
- Wolf, T.M., von Almen, T.K., Faucett, J.M., Randall, H.M. (1991). Psychosocial changes during the first year of medical school. *Medical Education, 25*, 174-181.

Appendix A-1: The Double ABCX Model (McCubbin & Patterson, 1983)



Appendix A-2:

The Double ABCX Model as Pertains to the Stresses of Veterinary Training



Appendix B-1:
Accredited Veterinary Training Programs
Participating in the Study

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Appendix B-2:

Initial E-Mail Letter to Deans

Date

Dear <<Dean>>

I am e-mailing you to request your assistance with a research project I am doing as a requirement for my Doctorate in Marriage and Family Therapy at Kansas State University.

Having worked at two different veterinary training programs, I noted that some students seemed to be highly stressed by the demands of their training program, which in turn may have had a deleterious effect upon their significant intimate relationship, though sometimes the effect seemed to be in the opposite direction. On the other hand, some students' significant intimate relationship appeared to be an asset to them in buffering the stresses they experienced during training. Along with program administrators at the two training programs, I have speculated as to what might account for the differences in how students respond to the stresses of training. As a mental health professional who has provided services to veterinary trainees and their significant others, I want to learn more about these effects so that I can provide the best care possible for my clients. I imagine it might also be helpful to administrators at veterinary training programs to have a better understanding of these dynamics as well, so that students can be better prepared for and/ or supported in managing these issues. Thus, for my doctoral research, I am hoping to conduct a survey research study of veterinary trainees (first year through interns and residents) to determine how these variables interact.

The survey I will use is comprised of several well-known, reliable and valid surveys from the field of social science, including the Rosenberg Self-Esteem Scale (which was utilized in the Brakke-Bayer study, 1999), the Perceived Stress Scale, the Perceived Quality of Academic Life Scale, the Kansas Marital Satisfaction Scale, and the Satisfaction With Life Scale, as well as some demographic questions. I am hoping you will assist me with distributing the survey to your program trainees via e-mail. This e-mail will contain an embedded website link, on which the

students can click to access the survey. Their answers will be dumped from the website into SPSS 14.0, the statistical package I will utilize to analyze the data. The trainees will remain anonymous, as will the program they attend. I have no desire at all to compare training programs in any way. Submission of the survey will constitute consent, as is explained in the opening Statement of Informed Consent. It should take most students about 30 minutes to complete the survey.

Though the questions asked on the survey are fairly benign, I will also include a link to therapistlocator.net, a web-based program to assist individuals with finding qualified mental health professionals near their area, in the event that completing the survey causes any mental distress. It is not anticipated that the survey will cause undue distress for anyone, but we want this resource to be available just in case. Subjects are also welcome to contact myself or my major professor, Dr. Anthony P. Jurich, if they have questions or concerns, or would like to consult with us about finding a mental health professional in their area to address any individual or relational issues that are causing them grief. Both Dr. Jurich and I are Licensed Clinical Marriage and Family Therapists in Kansas. Though we cannot provide therapy to out-of-state clients over the phone, we will be happy to assist anyone with finding a qualified mental health professional near their place of residence.

Kansas State University's Internal Review Board has reviewed this research project, and has granted approval for it.

Thank you so very much for your time and consideration. I will look forward to hearing from you within the next week as to whether you can assist me with my request or not. Once I receive confirmation that you are willing to assist, I will send the e-mail with the web link in it for you to forward to your students.

Most sincerely,

Teresa M. Nelsen, M.S.

Doctoral Candidate

Licensed Clinical Marriage and Family Therapist (Kansas)

Appendix C-1:

Statement of Informed Consent

Project Title: The Reciprocal Influence of the Stresses of Veterinary Training and Significant Intimate Relationships

Principal Investigators: Anthony P. Jurich, Ph.D., Professor, Department of Family Studies & Human Services, College of Human Ecology, Kansas State University

Co-Investigators: Teresa M. Nelsen, M.S., Doctoral Candidate; Mark B. White, Ph.D., & Candyce S. Russell, Ph.D., both Professors, Department of Family Studies & Human Services, College of Human Ecology, Kansas State University; & Ruthanne Chun, DVM, School of Veterinary Medicine, UW-Madison.

Sponsor of Project: NA

Purpose of Research: The purpose of this study is to explore how the perceived stresses of veterinary training impact the student's marriage or otherwise committed relationship, and vice versa.

Opening Instructions: You are invited to complete the following survey, which consists of several standardized survey instruments, as well as some demographic questions. As you do so please note that you may omit any question that you would prefer not to answer. If you are unsure about how to answer a question, please give the best answer you can. Completing the online questionnaire should take approximately 30 minutes.

We do not anticipate any risks associated with participating in the study, but you or other veterinary students (and their significant others) may benefit from this research, as it may help veterinary training programs better support their students during the training process. It will also help the mental health professionals who counsel veterinary students/ veterinarians and their significant others.

The information you share with us will be anonymous. Your answers, along with those of everyone else who participates, will be automatically “dumped” from this website into a

statistical package for analysis. We will not know who you are, or which program you attend, and we will not be able to “rank” programs in any way based upon your answers.

If you become distressed while completing the survey, we encourage you to go to www.therapistlocator.net, or to consult your local phone book, for the names of qualified mental health professionals in your area that can assist you in alleviating your distress.

If you have any questions about the study or problems with your participation, you can contact any of the following individuals:

Teresa M. Nelsen, M.S., LCMFT, Doctoral Candidate, Galichia Institute, Kansas State University, Manhattan, KS 66506; 785-532-6984

Anthony P. Jurich, Ph.D., Professor, Galichia Institute, Kansas State University, Manhattan, KS 66506; 785-532-1488

Rick Scheidt, Chair, Committee on Research Involving Human Subjects, 1 Fairchild Hall, Kansas State University, Manhattan, KS 66506, 785-532-3224

Jerry Jaax, Associate Vice Provost for Research Compliance and University Veterinarian, 1 Fairchild Hall, Kansas State University, Manhattan, KS 66506, 785-432-3224

TERMS OF PARTICIPATION: I understand this project is research and that my participation is completely voluntary. I also understand that, if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits, or academic standing to which I may otherwise be entitled. I verify that my submission of this survey indicates that I have read and understand this consent, and willingly agree to participate in this study under the terms described.

We thank you in advance for your thoughtful responses.

If you would like a copy of the final results of the study, please make your request to the Principal Investigator, Anthony P. Jurich, Ph.D., Galichia Institute, Kansas State University, Manhattan, KS, 66506, or email to jurich@humeck.ksu.edu.

Appendix C-2: Survey Instrument

Veterinary Training and Significant Relationships

Survey Description

The following survey is designed to gather information about your perceptions of the stress you experience during your veterinary training, about your level of self-esteem, about your satisfaction with your significant intimate relationship (if you are involved in one), about your satisfaction with your training program (which is not identified), and about your satisfaction with life in general. There are also some demographic questions. We want to find out how these variables interact so that veterinary training programs and mental health professionals can provide better support and services during training.

Opening Instructions

You are invited to complete the following survey, which consists of several standardized survey instruments, as well as some demographic questions. As you do so, please note that you may omit any question that you would prefer not to answer. If you are unsure how to answer a question, please give the best answer you can. Completing the online questionnaire should take no more than 30 minutes. We do not anticipate any risks associated with participating in this study, but you or other veterinary students (and their significant others) may benefit from this research, as it may help veterinary training programs better support their students during the training process. It will also help the mental health professionals who counsel veterinary students and veterinarians and their significant others. The information you share with us will be anonymous. Your answers, along with those of everyone else who participates, will be automatically "dumped" from this website into a statistical package for analysis. We will not know who you are, or which training program you attend, and we will not be able to "rank" programs in any way based upon your answers. If you become distressed while completing the survey, we encourage you to go to www.therapistfinder.net, or to consult your local phone book, for the names of qualified mental health professionals in your area that can assist you in

alleviating your distress. Many campuses also offer on-campus counseling services that are free of charge or low cost to students. If you have any questions about this study, or any problems with your participation, you can contact any of the following individuals (though be aware that doing so may compromise your anonymity): Teresa M. Nelsen, M.S., LCMFT(KS), Doctoral Candidate, Galichia Institute, Kansas State University, Manhattan, Kansas, 66506; 785-532-6984. Anthony P. Jurich, Ph.D., LCMFT(KS), Professor, Galichia Institute, Kansas State University, Manhattan, Kansas, 66506; 785-532-1488. Rick Scheidt, Ph.D., Chair, Committee on Research Involving Human Subjects, 1 Fairchild Hall, Kansas State University, Manhattan, Kansas, 66506; 785-532-3224. Jerry Jax, DVM, Associate Vice Provost for Research Compliance and University Veterinarian, 1 Fairchild Hall, Kansas State University, Manhattan, Kansas, 66506, 785-532-3224. TERMS OF PARTICIPATION: I understand that this project is research and that my participation is completely voluntary. I also understand that, if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits, or academic standing to which I may otherwise be entitled. I verify that my submission of this survey indicates that I have read and understand this consent, and willingly agree to participate in this study under the terms described. Thank you in advance for your time and thoughtful responses.

Page 1: *Demographic Information*

Please answer the following questions to the best of your ability.

1. Current age in years (write in)
2. Gender (M/F)
3. Race/ Ethnicity (mark all that apply): African American, Asian/ Pacific Islander, Caucasian, Hispanic, Middle Eastern, Native American, Other (Comment)
4. Religion: Atheist, Buddhist, Catholic, Charismatic Protestant, Hindu, Jewish, Mainline Protestant, Muslim, Other (write in)
5. Year in school: 1st, 2nd, 3rd, 4th, Intern, Resident, Other (write in)
6. GPA (write in)
7. Prior education: Technical training/ certification, BA/S, MA/S, Ph.D., Other (write in)
8. Reasons for choosing a veterinary career (rank in order of personal importance, 1 being most important): family legacy/ expectation, financial/ lifestyle incentives, a “calling,”

- love for animals, opportunity to practice medicine but not on people, opportunity to practice medicine with euthanasia option, prestige, science/ research, other
9. Sources of stress during veterinary training (rank in order of personal importance, 1 being most important): child care, competition among students, expectations of professors/ others, finances, grades/ personal performance, relationship(s) with colleagues, relationships with faculty, relationship(s) with significant others, time constraints, witnessing animal pain/ death
 10. Future plans after veterinary training is completed (rank in order of personal preference, 1 being most important): academics, industry, large hospital/ institution, private practice, public service (public health, armed services), research, training for specialty, other
 11. Funding source for/ during veterinary training (rank order with 1 providing the most): assistantship, family of origin, job, loans, savings, scholarship, spouse/ partner
 12. What is your current student loan debt? \$0 - \$25,000, \$25,001 - \$50,000, \$50,001 - \$75,000, \$75,001 - \$100,000, \$100,001 - \$125,000, more than \$125,000 (Comments)
 13. Current relationship status: choose not to date while pursuing veterinary training, casually dating, single but looking for a serious relationship, single but seriously dating one person, cohabitating and committed, married, separated, divorced, widowed (REQUIRED)
 14. (Page 2) Duration of current relationship status: less than 6 mos., 6 – 12 mos., 1 – 2 yrs., 2 – 3 yrs., 3 – 4 yrs., 4 – 5 yrs., more than 5 yrs.
 15. Are you satisfied with your current relationship status? (Y/N) (further comments)
 16. If you have had a significant relationship end in the past 5 years, do you think the break up was due in part to your [preparation for] veterinary training? (Y/N/NA) (further comments)
 17. (Page 3; filled out only if answered as being committed to Question 13) If you are currently involved in a committed relationship, what is the occupation of your partner? (pick the one that best applies): clerical, graduate or professional student (other than vet med), veterinary student), homemaker, laborer, managerial, medical, other medical training, professional, undergraduate student, veterinary student or professional, other (comments)

18. How many hours per week on average does your partner work?: less than 10, 10 – 20, 20 – 30, 30 – 40, 40 – 50, 50 – 60, more than 60, my partner does not work outside the home (comments)
19. (Page 4) What is your current yearly household income? Less than \$15,000, \$15,000 - \$30,000, \$30,001 - \$45,000, \$45,001 - \$60,000, more than \$60,000 (comments)
20. Do you have any children? (Y/N) (comments) (REQUIRED)
21. (Page 5; filled out only if answered yes to having children) If so, what are their ages? (write in the age of each)
22. How are they cared for during the day? (rank, with 1 being most commonly used) Share care with other parent, other family member, friend, home day care, day care center, old enough to care for themselves, other
23. (Page 6) Does your current veterinary training program include communication skills, grief, and/ or emotional intelligence/ support training? (Y/N) (comments) (REQUIRED)
24. (Page 7; filled out only if answered yes to Question 23) If so, is it required? (Y/N) (comments)
25. (Page 8) How many hours of this type of training have you taken? None, less than 10 classroom hours, 10 – 20 classroom hours, 20 – 30 classroom hours, 30 – 40 classroom hours, more than 40 classroom hours (comments)
26. What impact, if any, has veterinary training had on your significant relationship(s)? None/ no appreciable impact, I have less time for them but its not a problem, I have too little time for them and it is causing/ has caused problems, at least one significant relationship has ended due to my veterinary training, I have deliberately chosen not to engage in any significant relationships during my veterinary training process (comments)
27. Does your veterinary training program offer counseling assistance to students? (Y/N/ Don't know) (comments)
28. Does your veterinary training program offer counseling assistance for significant others (of veterinary students)? (Y/N/ Don't know) (comments)
29. If your program offers/ed counseling, have/ would you ever utilized these services? (Y/N/ Don't know) (comments)
30. For what reasons would/ have you utilize these services? (rank order, with 1 being most likely): anxiety, collegial relationship issues, depression, grief over loss of patient(s), loss

of own pet, personal grief/ loss, significant relationship issues, stress management, suicidality, other

31. (Page 9) *Perceived Stress Scale* (PSS; Cohen, Kamarck, & Mermelstein, 1983, p. 394)

Instructions: The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate. For each question choose from the following alternatives: 0 = Never, 1 = Almost Never, 2 = Sometimes, 3 = Fairly Often, 4 = Very Often.

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and "stressed"?
4. In the last month, how often have you dealt successfully with irritating life hassles?
5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?
6. In the last month, how often have you felt confident about your ability to handle your personal problems?
7. In the last month, how often have you felt that things were going your way?
8. In the last month, how often have you found that you could not cope with all the things that you had to do?
9. In the last month, how often have you been able to control irritations in your life?
10. In the last month, how often have you felt that you were on top of things?

32. (Page 10) *Rosenberg Self-Esteem Survey* (RSE; Rosenberg, 1965)

Instructions: Below is a list of statements dealing with your general feelings about yourself. For each question choose from the following alternatives: 0 = Strongly Disagree, 1 = Disagree, 2 = Agree, 3 = Strongly Agree (* These items are reverse scored).

1. On the whole, I am satisfied with myself.
2. At times, I think I am no good at all.*
3. I feel that I have a number of good qualities.
4. I am able to do things as well as most other people.
5. I feel I do not have much to be proud of.*
6. I certainly feel useless at times.*
7. I feel that I'm a person of worth, at least on an equal plane with others.
8. I wish I could have more respect for myself.*
9. All in all, I am inclined to feel that I am a failure.*
10. I take a positive attitude toward myself.

33. (Page 11) *Perceived Quality of Academic Life Scale* (PQALS; Okun, Kardash, Stock, Sandler, & Baumann, 1986)

Instructions: Please read the following statements and rank your feelings about them accordingly: 1 = Very Dissatisfied, 2 = Dissatisfied, 3 = Neutral, 4 = Satisfied, 5 = Very Satisfied. [The original version of this survey leaves a blank at the end of questions 1 – 4, presumably for the subject to fill in the name of their school. As we do not wish to obtain this information, we have substituted the phrase “your training program” in this space.]
How do you feel about...

1. Your education at [your training program]?
2. The classes you are taking at [your training program]?
3. What you are learning [in your training program]?
4. Your instructors at [your training program]?
5. The progress you are making toward your educational goals?
6. How well you are doing in your classes?

34. (Page 12; completed only if in a committed relationship) *Kansas Marital Satisfaction Survey* (KMS; Schumm, Bollman, & Jurich, 1977/2000)

Instructions: Please read the following statements and rank your feelings about them accordingly: 1 = Very Dissatisfied, 2 = Dissatisfied, 3 = Neutral, 4 = Satisfied, 5 = Very Satisfied. [As the researchers are interested in all committed relationships, whether they are legal marriages or not, we have substituted the word “relationship” for “marriage” in

Question 1, “partner” for “husband/ wife” in Questions 2 & 3, and “significant other” for “spouse” in Question 3.]

1. How satisfied are you with your [relationship]?
2. How satisfied are you with your relationship with your [partner]?
3. How satisfied are you with your [partner] as your [significant other]?

35. (Page 13) *Satisfaction With Life Scale* (SWLS; Diener, Emmons, Larsen, & Griffin, 1985)

Instructions: Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding. Anchor points for the scale are: strongly disagree (1), disagree (2), slightly disagree (3), neither agree nor disagree (4), slightly agree (5), agree (6), and strongly agree (7).

1. In most ways, my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

Closing Message

Thank you for your generous contribution of time and effort in completing this survey, as well as for your thoughtful responses. If you became distressed while completing the survey, we encourage you to go to www.therapistfinder.net, or to consult your local phone book, for the names of qualified mental health professionals in your area that can assist you in alleviating your distress. Many campuses also offer on-campus counseling services that are free of charge or low cost to students. If you would like a copy of the final results of this study, please make your request to the Principal Investigator, Anthony P. Jurich, Ph.D., Galichia Institute, Kansas State University, Manhattan, Kansas, 66506, or e-mail to jurich@humeck.ksu.edu.

Your survey has been successfully submitted.

Please close your browser to exit.