

CORRELATES OF PET-KEEPING IN RESIDENCE HALLS ON COLLEGE  
STUDENT ADJUSTMENT AT A SMALL, PRIVATE, MIDWESTERN COLLEGE

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A Dissertation presented to the Faculty of the Graduate School  
University of Missouri

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In Partial Fulfillment  
of the Requirements for the Degree

Doctorate of Philosophy

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by  
SHARON E. KIST

Dr. Rebecca Johnson, Dissertation Supervisor

MAY 2009

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The undersigned, appointed by the Dean of the Graduate School, have examined the  
dissertation entitled

CORRELATES OF PET-KEEPING IN RESIDENCE HALLS ON COLLEGE  
STUDENT ADJUSTMENT AT A SMALL, PRIVATE, MIDWESTERN COLLEGE

Presented by Sharon E. Kist

A candidate for the degree of Doctor of Philosophy

And hereby certify that in their opinion it is worthy of acceptance.

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Rebecca A. Johnson

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Terry L. Barnes

---

Alan M. Beck

---

Vicki Conn

---

Gina Oliver

## DEDICATION

I would like to dedicate this project to my husband and son, Bill and Matt Kist. Without their encouragement I would not have persisted to this point. They assisted me in both tangible and intangible ways. Their physical assistance provided me with extra time to attend class and to study. Their emotional encouragement is what has kept me afloat these past four year. Snuggles, hugs, and encouragement have been invaluable to this endeavor.

I also want to acknowledge the role of our family dog, Stanley. The unconditional love he has given our family is immense. Stanley has demonstrated so clearly that pets really do make us whole. Stanley passed away during the final phases of writing my dissertation. It was almost like he knew that he had completed his mission here on earth.

Even when I was a child, my parents, Tom and Verlee Delaney, encouraged my sister and I do to our best and move toward the future. This is a lesson that has continued through my lifetime.

Dr. Priscilla Lemone has to take credit for encouraging me to start the doctoral program. For several years, she would write on my evaluation, “Needs to consider doctoral program.” She and Dr. Roxanne McDaniel were persistent and I finally made the decision to apply to the program.

Finally, I want to thank my dear colleagues, staff, and students I have taught at MU Sinclair School of Nursing and Southern Arkansas University-Magnolia Department of Nursing. You have all been such great cheerleaders as I have pursued this degree.

## ACKNOWLEDGEMENTS

I would like to thank my dissertation committee for all of their support and encouragement. My dissertation advisor, Dr. Rebecca Johnson, has been so gracious in sharing her vast knowledge of human-animal interaction research. She has pushed me to think more deeply and develop a better understanding of the research process. Her caring attitude and sense of humor made this journey more enjoyable.

My other committee members have opened my eyes and supported my endeavors more than they can know. Dr. Terry Barnes showed me the world of college student services in a whole new light. Dr. Alan Beck from Purdue University has served as a wonderful model of excellence in human-animal interaction research. Dr. Vicki Conn has served as a mentor and role model as an exceptional educator and researcher for so many years. Dr. Gina Oliver has been my dear friend and colleague for many years. Her knowledge of the theory and practice of nursing education is beyond compare. The professors in my courses have provided me with knowledge and helped me to understand the world of nursing and education in a broader perspective.

I would like to also thank the administration at Stephens College, particularly Deb Duren, Danielle Koonce, and Lory Arnold. They provided me with access to the students at Stephens College without which this project would have never come to fruition.

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Sharon E. Kist

Dr. Rebecca Johnson, Dissertation Supervisor

ABSTRACT

A limited number of colleges and universities permit pets other than small aquariums in residence halls. No studies have been published documenting the effect of pets in residence halls. A matched two-group comparison of college students ( $N = 50$ ) compared pet owners with non-pet owners on adjustment to college and grade point average (GPA). Participants completed the following instruments: Student Adjustment to College Questionnaire (SACQ), State-Trait Anxiety Inventory (STAI), Relationship Questionnaire (RQ), Lexington Attachment to Pets Scale (LAPS), and Demographic Questionnaire. The two groups were similar on most demographic characteristics. Pet owners scored higher than non-pet owners on adjustment to college, anxiety, and GPA, but the differences were not statistically significant. Statistically significant between-group differences were found on LAPS scores and attachment tendency. In spite of equal numbers of participants having pets while growing up, students keeping pets in residence halls were more attached to their pets than those not keeping pets. The findings suggest that pet keeping while attending college can be beneficial for some students.

Key Words: Pet ownership, college students, attachment, adjustment to college

## Chapter I

### Introduction

The prevalence of pet ownership in United States households is between 50 and 60% (Parslow & Jorn, 2003, p. 403). Individuals obtain pets for a variety of reasons, such as sources of affection, to teach children responsibility, to enhance self-esteem, to improve socialization, as well as for purposes of status, decoration, recreation, companionship, assistance and utility (Brasic, 1998). Pet ownership has been found to have both physical and emotional advantages.

Research has demonstrated that pet ownership is generally beneficial to a wide range of human participants, but the findings regarding the benefits are not consistent. Research has been conducted on both the effects of pet ownership and the effects of simply interacting with a pet in a controlled setting. Studies have demonstrated that both physical and emotional benefits can be associated with pet ownership and/or interacting with a pet. Pet ownership and/or interaction have been described as having the following effects: decreased blood pressure (K. Allen, Shykoff, & Izzo, 2001; Baun, Bergstrom, Langston, & Thoma, 1984; Friedmann, Katcher, Thomas, Lynch, & Messent, 1983; Friedmann, Thomas, Cook, Tsai, & Picot, 2007), improved survival following a cardiac event (Friedmann, Katcher, Lynch, & Thomas, 1980; Friedmann & Thomas, 1995), walking more (Dembicki & Anderson, 1996; Serpell, 1991) and taking fewer medications (Headey, 1999). Emotional benefits of pet ownership have been demonstrated to include better overall psychological health (Straede & Gates, 1993), greater happiness (Ory & Goldberg, 1983), and improved mood (Colby & Sherman, 2002). Based on the wide

range of effects of pet ownership, the relationship between human and pet is probably complex and multi-faceted.

Most studies of human-animal interaction (HAI) have been conducted with adult participants. A limited number of studies have been conducted with college age students, mostly for either the purpose of instrument development or in controlled experimental situations. A limited number of descriptive studies have been conducted with college students investigating attachment to a pet and either commitment to pet, generativity, or pet care behaviors (Marks, Koepke, & Bradley, 1994; Shore, Douglas, & Riley, 2005; Staats, Pierfelice, Kim, & Crandell, 1999). None of the HAI studies with college age students addressed the relationship between pet ownership and students' adjustment to and persistence in college.

Several theoretical frameworks have been proposed to explain the complex relationship involved in pet interaction and ownership, but none have been either tested extensively or widely disseminated (A. M. Beck & Katcher, 2003; Brasic, 1998; Staats et al., 1999). Proposed frameworks have been based on biophilia, a belief that humans have an affinity for animals beyond a utilitarian function (A. M. Beck & Katcher, 2003; Lawrence, 2000). Still, participants consistently have reported that they feel their pet is part of their family (Barker & Barker, 1988; A. M. Beck & Katcher, 1996; Berryman, Howells, & Lloyd-Evans, 1985; S. P. Cohen, 2002).

Viewing pets as family members demonstrate that an individual has become attached to their pet. Voith (1985, p. 290) described attachment to a pet as "an emotional state or feeling or behaviors to keep another in close proximity." This definition of attachment to a pet is similar to that of attachment theory as described by Bowlby and

Ainsworth in the early 1900's (Bretherton, 1992). Attachment theory describes the response by a small child when separated from its mother (Cassidy & Shaver, 1999). During this stressful event, attachment tendencies are said to be activated. As a result, a child would try to keep its primary caregiver close. The caregiver meets the physical and emotional needs of the child. As children develop, they venture away from the caregiver (secure base). If the caregiver is responsive to the child's need for both exploration and security, it is said that the child has a secure attachment to its caregiver. On the other hand, if the caregiver is not consistently available, the attachment is described as being insecure.

The original work on Attachment Theory used two categories of attachment, either secure or insecure. Those with secure tendencies were able to have their needs met. In contrast, those with insecure tendencies did not have someone that could be counted on to assist with meeting their emotional needs during times of stress. Insecure attachment tendencies have been further categorized into three and eventually four categories of secure, preoccupied, fearful, and dismissive attachment (Bartholomew & Horowitz, 1991). Those with secure attachment have a positive view of themselves and others; those with preoccupied tendencies have a negative view of themselves and positive view of others; those with fearful tendencies have a negative view of themselves and negative view of others; those with dismissing tendencies have positive view of themselves and negative view of others (Searle & Meara, 1999). These tendencies serve as the basis for coping with difficult situations. For the toddler, separation from a caregiver is the primary means by which attachment tendency is activated.

A similar situation occurs during adolescence, as the child moves toward adulthood. The adolescent becomes more independent, completes high school, starts college, and selects a career. The caregiver becomes less essential, as developing adults are able to independently care for themselves and others, both emotionally and physically (J. P. Allen & Land, 1999). The transition to adulthood is a time of considerable change, stress, and anxiety which challenges individuals' existing coping strategies. According to Attachment Theory, attachment tendencies are said to be activated (Bretherton, 1992). This means that in an attempt to cope with the situation at hand, individuals revert back to their previously acquired methods of dealing with a stressful situation (J. P. Allen & Land, 1999).

For many young people, one of the major transitions of adolescence is the experience of attending a college or university. The transition from living with one's family and attending high school to living in a residence hall and taking college courses is a significant one. Attachment researchers have found that students with secure attachment tendencies are most likely to adjust to and persist in college (Howard, Morey, & Briancesco, 2003; Lapsley & Edgerton, 2002; Larose, Bernier, & Tarabulsky, 2005; Mattanah, Hancock, & Brand, 2004; Perrine, 1998, 2001). Schwartz and Buboltz (2004) found the adjustment to college to be a multidimensional phenomenon, requiring a balance between trust, communication, and attachment to others. The concept of attachment tendency could be helpful in explaining why not all students are successful in the transition to college life.

One model that has been used to describe student departure/persistence in college is Tinto's Model of Student Departure. According to the model, whether or not a student

persists in college is a multidimensional phenomenon involving integration into both the academic and social systems of the higher education institution (Tinto, 1987). Programs to promote retention tend to focus on personal as well as academic factors, with primary attention to the first year experience and less attention to subsequent years. The implementation of student retention programs has resulted in only a small increase in retention; such programs are continually being revised.

Nationally, retention rates to the second academic year generally do not exceed 79% (Micceri & Wajeeh, 1999; Pascarella & Terenzini, 2005; Pike, Schroeder, & Berry, 1997; Sidle & McReynolds, 1999). Retention programs have been developed with the hope of improving student adjustment and retention to subsequent years. Nationwide, nearly 95% of colleges and universities have a freshmen seminar course designed to improve retention to the second year (Pascarella & Terenzini, 2005). Freshmen orientation/seminar courses are multidimensional and focus on enhancing students' academic and social adjustment to college.

In order to enhance adjustment to college, a limited number of colleges and universities have implemented programs that allow pets to live with students in residence halls. The intent of such pet programs is that the pet serves as a familiar, comforting source of support in an unfamiliar situation. Additionally, the pet can serve as a social lubricant to facilitate interaction among college students (Serpell, 2000). A final benefit to pet-keeping in residence halls is that the presence of one's own pet may improve student satisfaction and retention. One college with a pet program is Stephens College in Columbia, Missouri ([www.stephens.edu](http://www.stephens.edu)) (Unknown, 2007). The Vice President for Student Services/Athletic Director at Stephens College stated that the pet program has



been very successful and has been expanded to increase the number of rooms/residence halls allowing pets (personal communication, D. Duren, June 2008). In addition to allowing Stephens students to keep their own pets in either a specific pet-allowing residence hall or on a pet-allowing floor of another hall, students may also become foster caregivers to animals from a local shelter. These pets are kept in the residence hall along with students and their own pets. All pets are carefully screened for medical and behavioral problems. While the program is reported to be successful, no research has been conducted to study differences in college students who do and do not have a pet living with them in the residence hall. In addition, no studies have addressed the role of attachment to pets in the process of adjustment to college. The purpose of the current study is to evaluate the effect of keeping a pet in a residence hall on adjustment to college.

## Chapter II

### Review of Related Literature

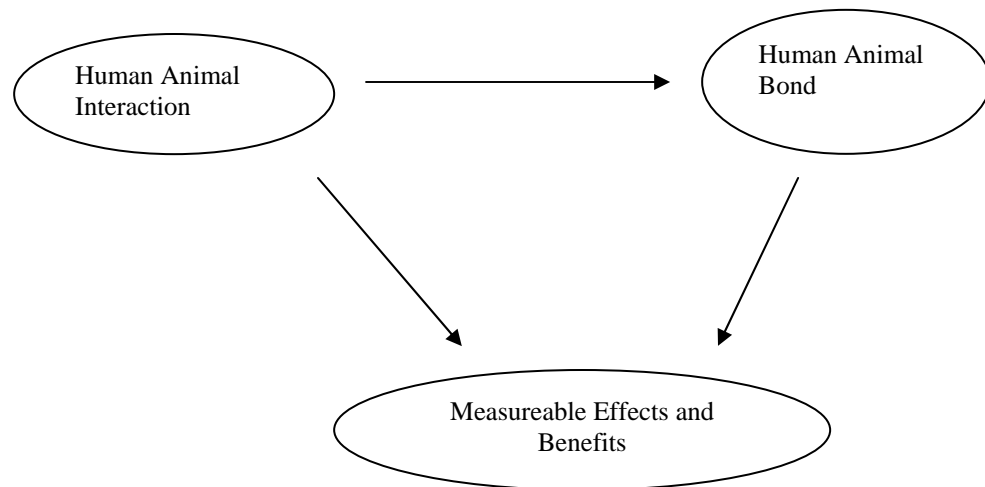
This chapter has three major sections. The first is a review of human-animal relationship studies, including general studies about the effects of human-animal interaction and those studies specific to college students. The second section is a discussion of the concept of attachment and the relationship between attachment tendencies and adjustment to college. The third section is a discussion of Tinto's Theory of Student Departure and the manner in which it guides the current study.

#### *Previous Human-Animal Relationship Research*

*Background and Definitions.* Between 50 and 60% of United States households own pets (Parslow & Jorn, 2003; "Pet Industry Statistics and Trends," 2008). The prevalence of pet ownership in households with children is even greater; 70-92% of households with children have pets in the home (Marks et al., 1994; Triebenbacher, 1998). Based on these statistics, the majority of current college age students probably have experienced the beneficial effects of pet ownership prior to attending college. The following discussion will demonstrate that the majority of human-animal relationship research studies have used community dwelling adults as the target population, while a limited number of studies have focused on college students.

Human-animal interaction (HAI) and the human-animal bond (HAB) are two related but different terms (Figure 1). Human animal interaction (HAI) is the term used to describe the interaction between a human and an animal (Russow, 2002). This interaction may occur in a natural setting with pet owners, but may also occur as part of a therapeutic intervention as in either animal-assisted activities or animal-assisted therapy.

In the case of pet ownership, HAI interaction may or may not lead to the development of the HAB. How and under what conditions the bond develops are not well understood. Studies of humans and domesticated animals have involved the effect of animal interactions, as well as the effect of bonding with a pet. The term HAI will be used in this proposal to describe the broad range of studies that address both HAI and HAB.



Assumes positive attitude towards human animal interaction. Must recognize that not all humans equally value human pet interaction.  
Adapted from (C. C. Wilson, 1994)

Figure 1 Relationship between Human-Animal Interactions and Human-Animal Bond

The “human-animal bond” (HAB) is the term used to describe the relationship that forms between a human and a domesticated animal. This phenomenon is particularly shown in the relationship between people and their pets. Research findings have indicated that pet ownership is beneficial to people in several ways. Many of the benefits are health related, such as decreased blood pressure, decreased anxiety, and improved social interaction and perception of well-being (Baun et al., 1984; Friedmann et al., 1983; R. A. Johnson & Meadows, 2002; C. C. Wilson, 1991). The benefits of pet ownership

most likely are associated with the relationship between the human and the animal. Katcher (1985) noted that pets could serve at least seven psychological and social functions. These include: “1) companionship, 2) keeping people active, 3) stimulating caregiving, 4) making owners feel safe, 5) exchange of affectionate touch, 6) interesting visual appearance, and 7) stimulus for exercise” (Katcher, 1985, pg. 403). This 1985 observation was supported in a more recent study of adults and college students (Staats, Wallace, & Anderson, 2008). Scientific inquiry into these functions has provided insight into the human-animal bond. Katcher’s description reflects the operational definition used by most HAB researchers and will serve as the basis for this research project.

Human animal relationship research has two major foci (Nimer & Lundahl, 2007). One is effects of pet ownership, including physical and psychosocial health. The other focus is the use of pets as an intervention. Pet intervention examples would include animal-assisted activities, animal-assisted therapy, and studies of the effects of interacting with a pet on physiological parameters, such as blood pressure (BP), pulse (P), and psychological parameters, such as stress (Straatman, Hanson, Endenburg, & Mol, 1997; C. C. Wilson, 1991). Animal-assisted activity (AAA) differs from animal-assisted therapy (AAT) in that AAA provides opportunities for casual human-animal interactions (such as visits), while AAT is goal directed and may be part of an overall therapy plan (*Standard of Practice for Animal-assisted Activities and Animal-assisted Therapy*, 1996).

The following narrative discussion will focus on an evaluation of HAI studies including comparisons among studies and critique of research methods. Details regarding each study can be found in Appendix A.

*HAI Studies of Pet Ownership.* Studies related to the benefits of pet ownership have demonstrated increased survival rates following myocardial infarction (Friedmann, Katcher, Lynch, & Thomas, 1980; Friedmann & Thomas, 1995). While the findings of these studies were powerful in terms of describing benefits of HAI and have been cited liberally in publications, the research designs were non-experimental, correlational designs. Non-experimental designs are weaker in terms of explaining cause and effect due to the lack of control of extraneous variables (Kerlinger & Lee, 2000). The findings of correlational studies are difficult to interpret due to the interrelationship of human variables (Polit & Beck, 2008). Furthermore, Friedmann's first study (1980) used a relatively small sample of 92 participants, over a year. The second non-experimental study selected a larger sample (N = 424 participants) from an existing study, the Cardiac Arrhythmia Suppression Trial (CAST). The larger sample size was more representative of the target population and increased the likelihood of generalizable findings. At the same time, the larger sample size may have artificially inflated a modest effect (Polit & Beck, 2008). Investigators reported that dog ownership and social support were independent predictors of survival from the myocardial infarction (MI). Dog ownership was found to be helpful to participants in coping with a stressful event (MI). Pet ownership, but not pet attachment was evaluated in both of Friedmann's studies. Although these studies were not experimental in design, the use of logistic regression as a statistical method, helps to substantiate the benefits of pet ownership as being more than just coincidental. Logistic regression was used to assess the effect of multiple independent variables (anxiety, anger, depression, ejection fraction, etc.) on a dependent variable (survival following a myocardial infarction) (Tabachnick & Fidell, 1996).

Many other less well-known studies have been conducted with samples of older adults comparing pet owners with non-pet owners on a variety of measures, including blood pressure, height, weight, lipid profiles, and dietary intake (Dembicki & Anderson, 1996; Lawton, Moss, & Moles, 1984; Ory & Goldberg, 1983; Serpell, 1991). These researchers found that pet ownership often was beneficial, but the results were not consistent. For example, pet owners were found to have higher body mass indices (BMI) than non-pet owners, yet triglyceride levels were lowest in non-pet owners (Dembicki & Anderson, 1996). A variety of methodological issues most likely contributed to such findings. For example, Lawton, Moss, and Moles (1984) did not find that pet owners demonstrated stronger sense of well-being than non-pet owners. Their data, collected in 1969, classified participants as pet owners only if a pet was either observed or there were indications of the presence of a pet in the household. Evidence of pet ownership may not be readily visible to a one-time visitor, therefore the incidence of pet ownership may be underreported in this study.

Beck and Katcher (2003) suggested that explicit pet ownership data be collected routinely in order to better profile patterns of ownership. Similarly, Davis (1991) identified the need for data on pet ownership to be included in all baseline nursing assessments. Widespread collection of data regarding pet ownership in either nursing research or nursing practice has not been implemented. However, additional data on pet ownership would help to understand patterns of pet ownership, as well as demonstrate benefits of pet ownership.

Another methodological issue is that the type of pet owned often has not been differentiated in HAB studies. Bonding is not identical from one type of pet to another.

For instance, Serpell (1991) found that new dog owners walked more and had improved health scores, while cat owners had fewer health complaints in comparison with non-pet owners whose health state remained essentially unchanged. The dog owners sustained their increased activity over the ten months of the study, while the benefits of cat ownership were not sustained. While both cat and dog owners reaped benefits in Serpell's study, the exact benefits differed as well as the duration. In another study, dog owners were found to have stronger pet attachment than cat owners, but differences on physical functioning did not differ based on type of pet (Raina, Waltner-Toews, Bonnett, Woodward, & Abernathy, 1999). Most studies do not differentiate among the types of pets owned and this may confound the findings, particularly in studies with small samples. Small convenience samples may over represent one type of pet and skew the results.

Attachment to the pet may determine whether or not an individual receives the benefit of pet ownership and/or interaction. Attachment to one's pet can be measured through a variety of questionnaires (D. C. Anderson, 2007), but these have not been consistently implemented in HAB research. Not all HAI studies have measured attachment and those that do have used a variety of pet attachment instruments. Some pet attachment instruments have undergone psychometric testing, while others have not. The presence of attachment was determined to be important in a study of older women (Ory & Goldberg, 1983). The investigators found no relationship between pet ownership and happiness in a sample of older women (N = 1073). However, when attachment to a pet was considered, those who considered themselves to be less attached were also less happy. It should be noted that these unhappy women also did not consider their husbands

to be confidants. Ory and Goldberg (1983) demonstrated that simply owning a pet does not equate to attachment and necessarily lead to happiness. Human animal interaction studies have not consistently assessed pet attachment and this has contributed to some of the inconsistent findings related to health, well-being and pet ownership. The importance of attachment to pets was supported in a more recent study (L. Beck & Madresh, 2008). The findings demonstrated that human relationships with pets were perceived to be more secure than those with romantic partners on all measures of attachment (L. Beck & Madresh, 2008). This is the first study that has compared attachment to pets with attachment to humans. By understanding the role of attachment to pets, the human-animal bond can be better understood as well. The concept of attachment will be discussed later in this paper.

The benefits of pet ownership for physical health state were reported in three reports of studies conducted in Australia (W. P. Anderson, Reid, & Jennings, 1992; Headey, 1999; Straede & Gates, 1993). Anderson, Reid, and Jennings (1992) and Headey (1999) both had samples sizes of over 1000. As mentioned previously, large samples do not always strengthen the findings. Instead they may over exaggerate significant relationships (Tabachnick & Fidell, 1996). Only 13.6% of participants were pet owners in the study by Anderson, Reid, and Jennings (1992), compared with approximately 50% in the United States and 57% in Australia (Parslow & Jorn, 2003). Pet owners exercised more, ate more meat, and ate more take-out meals than non-pet owners. Pet owners also had lower systolic blood pressure and triglyceride levels (W. P. Anderson et al., 1992). Multiple data sources (questionnaires and physiological measures) as were used by Anderson and colleagues (1992), further validate the benefits



of pet ownership (Polit & Beck, 2008). The use of differing sources of data such as questionnaires and physiological measures can be used to triangulate data and partially confirm the benefits of pet ownership.

In another Australian study, cat owners were found to be psychologically healthier overall than non-cat owners (Straede & Gates, 1993), but no significant differences were found between groups on specific mental health disorders such as depression, anxiety, and sleep disturbances. By selecting a sample of only cat owners, the findings are generalizable to the population of cat owners, but few studies have focused on just one type of pet. The benefits of pet ownership vary by type of pet owned (Serpell, 1991). It is not always practical to recruit a sample of individuals who own just one type of pet. Investigators using small samples of pet owners generally do not differentiate among types of pets owned. Differentiating by type of pet would limit statistical analyses. Both studies discussed above (W. P. Anderson et al., 1992; Straede & Gates, 1993a) generally demonstrated the physical and psychological benefits of pet ownership in samples of community-dwelling adults.

Headey (1999) found that participants who owned pets other than cats and dogs did not reap the health benefits often associated with owning either cats or dogs. Headey's study used a large, stratified, randomly selected sample (N = 1011 pet owning and non-pet owning households). Additionally, the surveyors asked to speak to the primary caregiver of the household pet, based on the assumption that this person would be most attached to the pet. Attachment to the pet was not measured. By using this approach, Headey was able to reach the individual with the closest relationship with the pet and therefore most likely to have reaped health benefits from pet ownership.

Headey's results indicated that three groups reaped the most health benefits from pet ownership, young women (under 25 years of age) and older women and men (over age 55). The fact that women under the age of 25 benefitted from pet ownership is relevant to the current study of college students and pet ownership, as this study uses a sample of college age women. Headey (1999) extrapolated the health care cost savings from pet ownership as \$1.8 billion, while the cost of pet ownership was not addressed. Australians were estimated to have spent \$4.62 billion on pet care products and services (Australian Companion Animal Council, 2006), indicating that the projected saving was not without substantial cost.

Along the lines of healthcare utilization, pet ownership was associated with fewer physician visits in a sample of Medicare recipients (Siegel, 1993). Siegel's (1993) study used a large sample, but only 37% of participants were pet owners. This may be due to the fact that the participants were older and less physically able to care for a pet. In addition to fewer physician visits, Siegel also demonstrated that even during psychologically stressful times, pet owners made fewer physician visits than did non-pet owners. These findings demonstrated that the pet served as a buffer during stressful times, as well as being associated with less utilization of healthcare resources.

Two descriptive studies demonstrated that pet ownership is not always beneficial (Fritz, Farver, Hart, & Kass, 1996; Stallones, Marx, Garrity, & Johnson, 1991). Stallones and colleagues (1996) found that in two age groups (21-34 and 45-64), those who were less attached to their pets, had higher social network scores, meaning that less attached pet owners were perhaps more socially engaged with people, than those who were more attached to their pet. In the early middle age group (35-44), pet attachment was

significantly positively associated with emotional distress; meaning that as pet attachment increased so did emotional distress. On a positive note, pet ownership and attachment to a pet were not associated with illness, emotional distress, or negative life events. The findings of this study demonstrated a correlation between two factors (emotional distress and pet attachment). It did not demonstrate a cause and effect relationship. As mentioned previously, correlational designs are considered to be weaker than experimental designs in explaining relationships among variables (Kerlinger & Lee, 2000).

In another study, differences between pet owners and non-pet owners on psychological indices (life satisfaction and depression) were not found in a sample of caregivers of patients with Alzheimer's disease (Fritz et al., 1996). Middle aged female caregivers (40-59) with pets had lower life satisfaction scores and higher scores on the Geriatric Depression Scale than women the same age without pets. However, young women (<40 years) and men of all ages with pets were found to have lower Caregiver Burden scores than young women without pets (Fritz et al., 1996). The sample in this study varied widely in degree of caregiving responsibility, which may have contributed to the fact that some groups experienced greater depression and burden of being a caregiver than others. Similar to the study discussed above, participants in this study who were extremely attached to their pet demonstrated fewer social outlets than those who were less attached. It is possible that the highly attached individuals had fewer opportunities for social interactions and therefore became extremely attached to their pet. A correlational study design cannot demonstrate a causal relation and the findings must be evaluated cautiously. This particular study categorized responses by type of pet owned,

which may have contributed to inconsistent findings. By differentiating among types of pets owned, a better understanding of pet ownership by species could be gained, but findings would be limited to owners of that particular species.

Similarly, Parslow and Jorn (2003) did not demonstrate uniform benefits of pet ownership. Pet owners had less education, higher diastolic BP, higher body mass index (BMI), and were more likely to smoke. Controlling for health risks, pet owners had significantly higher diastolic, but not systolic BP. Factors such as pet attachment and length of ownership were not determined and might be worthy of consideration as demonstrated in the study by Ory and Goldberg (1983) in which differences were noted when pet attachment was considered. Further systematic investigation that includes attachment to pets will be necessary to fully understand the health benefits associated with pet ownership.

The studies discussed thus far have all used non-experimental designs that relied primarily on questionnaires with limited biophysiological measures to assess the benefits of pet ownership. The participants of these studies self-selected pet ownership as part of their lifestyle. Self-selection does not allow for the demonstration of a causal relationship between and among variables such as pet ownership and health status (Kerlinger & Lee, 2000). Instead statistical procedures were used to control for confounding variables. Statistical control has been useful in studying concepts, such as HAB with multiple confounding variables. For example, multiple regression analysis was used to assess several variables, including pet ownership, associated with emotional distress and illness behavior (Stallones et al., 1991). Statistical control assists the investigator in

understanding the contribution of several independent variables to the dependent variable (Tabachnick & Fidell, 1996).

The overall benefits of pet ownership discussed thus far are consistent with the findings of a small qualitative study designed to describe the benefits of animal assisted therapy (AAT) in long term care (Roenke & Mulligan, 1998). Four themes were noted from participant interviews: (a) human component, (b) anticipation of and continuity from animal visits, (c) facilitation of reminiscence, and (d) social aspects of the visits, facilitation of interaction. The themes of this study are consistent with large quantitative studies on the benefits of pet ownership. Although the sample size was small ( $N = 4$ ), the consistency with other HAI research findings improves transferability. The use of a different data source (interviews) helps substantiate the quantitative findings already discussed.

While most HAI researchers have collected data via either physiological measures and/or questionnaires, a group of studies have used unique self-report data collection methods such as the Repertory Grid Technique (Berryman et al., 1985), Family Life Space Diagram (Barker & Barker, 1988), and Social Network Map and Grid (S. P. Cohen, 2002). By measuring the notion of pet as family member by a variety of methods, the validity of this association is strengthened. Self-reports are useful for gathering data related to variables that cannot be measured otherwise, such as importance of pet to the owner (Polit & Beck, 2008). The drawback to self-report measures is that the investigator must assume that the participants have reported their perceptions accurately and honestly. All three data collection methods (Repertory Grid Technique, Family Life Space Diagram, and Social Network Map and Grid) assessed the relationship

between the participant and their pet, demonstrating that their pet was very important to the participant, like a member of the family (Barker & Barker, 1988; Berryman et al., 1985; S. P. Cohen, 2002). Considering the pet as a member of the family has been commonly found in published literature and had been included as a factor in pet attachment and pet attitude instruments.

The descriptive studies discussed thus far generally show that pet ownership can be beneficial, but have not provided an explanation as to why this may be the case. A number of experimental and quasi-experimental studies have been conducted in an attempt to better understand the effects of human-pet interaction on a variety of physiological measures.

*HAI Studies of Pet Interaction.* Several studies have evaluated the effect of interacting with a dog in a controlled setting on BP and HR (K. Allen et al., 2001; Baun et al., 1984; Friedmann et al., 1983; Friedmann et al., 2007). The results in each study demonstrated that either pet ownership or pet interaction resulted in a decrease in BP and HR when participants were exposed to a stressful condition. In contrast to the previously discussed studies, the experimental design of these studies allowed for greater control of extraneous variables, better demonstrating the beneficial effect of pet interaction. Only the study by Baun and colleagues (1984), assessed attachment to the pet. These studies used small convenience samples, ranging from less than 50 up to 240 participants. Each study, except for Baun and colleagues (1984), conducted all or part of their experiment in a home setting. Use of a variety of ages and conditions provides evidence that both animal interaction and pet ownership can impact BP and HR in a healthy manner.

Studies of physiological parameters other than BP and HR have been conducted more recently. Odendaal (2000) evaluated BP as well as serum B-endorphin, oxytocin, prolactin, B-phenylethylamine, dopamine, and cortisol in a study comparing dog owners with non-dog owners while either interacting with their own dog, an unfamiliar dog, or doing quiet reading (control situation). The study was well designed with adequate controls to demonstrate that interacting with a dog not only influenced BP, but also serum levels representing stress and sense of well-being. The effects were strongest when the participants interacted with their own dogs. The duration of the intervention was quite short (5-24 minutes), indicating that brief, frequent interactions with an animal are beneficial.

Another study compared oxytocin levels of men and women (N = 10 women and 10 men) before and after either interacting with their own dog or doing quiet reading (Miller et al., 2009). The findings demonstrated that women had statistically significant increases in oxytocin following dog interaction, whereas oxytocin levels decreased in women with quiet reading and men in both conditions. This study as well as Odendaal's study contributed to our understanding of HAB by demonstrating biophysiological effects of pet interaction.

Another well controlled study used advanced technology as part of the data collection (Motooka, Koike, Yokoyama, & Kennedy, 2006). High frequency (HF) power values of heart rate variability were assessed during dog-walking. Greater HF power is associated with parasympathetic activity. It was determined that the addition of the dog provided even greater benefits than walking without the dog and that this effect strengthened over time (Motooka et al., 2006). The use of HF power values provides yet

another measure of how physiological activity may be influenced by interacting with a pet. Further replication of studies similar to those of Odendaal and Motooka and colleagues will assist in understanding HAI on a biophysiological level. The use of both questionnaires and biophysiological measures provides evidence of both the physical and psychosocial effects of human-animal interaction.

In another experimental study, the effects of the presence of a fish aquarium on the dietary intake of dementia patients was studied (Edwards & Beck, 2002). The use of dogs and cats as an intervention with dementia patients generally is considered to be unsafe due to the unpredictable nature of both the humans and the animals, but the aquarium provided a safe means of an animal intervention. The presence of the aquarium was thought to calm the restless residents, while the lethargic residents became more alert and consumed more food. Three sites were used in this time-series design study. Two sites received the treatment only and the third site served as the control site, as well as a treatment site after control site data had been collected. The use of a control group and multiple sites strengthened the results of this study. No data were collected on either previous pet ownership or pet attachment by the residents. The studies discussed thus far have demonstrated that the beneficial effects are multi-dimensional as demonstrated by the fact that pet ownership and/or pet interaction is beneficial to emotional state, physical health, and biophysiological markers.

The next group of studies to be discussed will address participants' emotional response to planned animal interactions (Colby & Sherman, 2002; Cole & Gawlinski, 2000; R. A. Johnson, Meadows, Haubner, & Sevedge, 2003; Kaiser, Spence, McGavin, Struble, & Keilman, 2002). Most HAI researchers believe that interactions with animals



and/or pet ownership can influence a variety of emotions, including mood, and particularly anxiety, and depression. The samples in these four studies were all quite small, ranging from five to fifty two. The use of such small samples is generally not adequate to establish that the intervention was the cause of the change in the dependent variable (Polit & Beck, 2008). The duration of a pet intervention to yield a beneficial psychosocial response has not been determined. The duration of interventions ranged from five to fifteen minutes, while the aquarium used in Cole and Gawlinski's (2000) study was in the hospital room continuously. As discussed earlier, Odendaal (2000) noted changes in BP and P within the first five to twenty four minutes of the experiment. None of these four studies collected data regarding previous pet ownership and pet attachment. Only the study by Colby and Sherman (2002) took into consideration the attachment tendency of the participant. Improved mood scores following the interactions were noted in residents with secure attachment tendencies. Feelings of depression increased for those with fearful avoidant tendencies. Differences in attachment tendency influenced participants' response to the dog and will be discussed further in the attachment section of this chapter.

While an animal may not be beneficial to individuals under extreme stress such a treatment for cancer (R. A. Johnson et al., 2003), waiting for an organ transplant (Cole & Gawlinski, 2000) or caring for a person with Alzheimer's disease (Fritz et al., 1996), pet interaction does seem to be beneficial to participants experiencing laboratory induced stressors (K. Allen et al., 2001; Baun et al., 1984; Friedmann et al., 1983; C. C. Wilson, 1991). It may be possible to apply the benefits of pet interaction to college students

based on the fact that attending college is a transitional time which is somewhat stressful, but not life threatening.

Meta analyses are intended to synthesize a body of research literature and to guide future research and practice (Polit & Beck, 2008). Two meta-analyses related to HAI have been published recently (Nimer & Lundahl, 2007; Souter & Miller, 2007). The studies differed in their focus. One study evaluated the benefits of AAT in general (Nimer & Lundahl, 2007), while the other evaluated the benefits of AAA/AAT on depression (Souter & Miller, 2007). Both studies demonstrated that animal-assisted interventions had a moderate effect. These are the first meta-analyses that have been conducted and provide confirmation that the benefits of HAI have been established through numerous studies.

Overall, the studies presented above demonstrate that while HAI is generally beneficial, the findings are not consistent. Many of the studies that do not demonstrate the benefits of pet ownership did not address the concept of attachment to the pet in their design. As demonstrated by Ory and Goldberg (1983), attachment to the pet did make a difference in whether or not benefits from pet ownership were measureable. For some individuals, pet ownership may be considered a burden in that pet care is one more item on a list of tasks to be accomplished each day. In contrast, an individual attached to their pet would be much more likely to spend quality time interacting with and caring for the pet on a daily basis.

The target population in most of the above studies has been adults. College students have been the target population for fewer HAI research studies. The next section will discuss HAI studies that focused on college students.

*HAI Research and College Students.* Parents often obtain pets for their children with the intent of the child developing a sense of responsibility for pet care (Melson, Schwarz, & Beck, 1997). Parents expect the child to interact with and care for the pet daily. By providing pet care, the child develops responsibility and attachment to the animal. However, when the child leaves home to attend a college or university, the pet must be left behind along with other family members. Typical college student living arrangements, such as residence halls, Greek houses, and apartments, do not permit pets, other than fish, gerbils, and other small pets that are easily caged. As a result, college students are removed from sources of social support, parents, siblings, and pets. Very few studies related to pets and college students have been conducted and none have evaluated the effect of a pet on adjustment to college. The role of pets and adjustment to college may be an important area of study, due to the number of life changes that occur during this time.

Most commonly, undergraduate students are participants in instrument development studies (Lago, Kafer, Delaney, & Connell, 1988; Poresky, Hendrix, Mosier, & Samuelson, 1987; Templer, Salter, Dickey, Baldwin, & Veleber, 1981). Undergraduate students do not tend to be the target population for HAI research programs. The following is a discussion of HAI studies that used college students for purposes other than instrument development. Many of the HAI studies that have been conducted with samples of college students are distinctly different from each other, making comparisons challenging.

Previous descriptive studies with college students have involved selection of a dog (Kogan & Viney, 1998), relationship of attachment and pet care behaviors (Shore et al.,

2005), attachment and commitment (Staats et al., 1999), and attachment and generativity (Marks et al., 1994). Similar to the studies of adults, these studies relied on convenience samples and on data collection via questionnaires. The findings of these studies reflect a positive association between attachment and each of the concepts measured (pet care behavior, generativity, and commitment), similar to studies with samples of adults and older persons. However, these studies do not consider factors related to success in college, something that is important to this population.

Two studies compared undergraduate student pet owners with undergraduate student non-pet owners (Fidler, Light, & Costall, 1996; Zasloff & Kidd, 1994). Using two different methodologies, differences between pet owners and non-pet owners were demonstrated. Fidler and colleagues (1996) used a unique method of data collection by asking participants to view several videos of pet interactions. Pet owners were found to describe “the dogs’ behavior in terms of desires, feelings, and understanding” more than non-pet owners (Fidler et al., 1996). The researchers believed a sense of attachment influenced how pet owning participants described the video clips (Fidler et al., 1996). The collection of additional data on pet attachment, attachment tendency, and adjustment to college could have better explained between group differences. The collection of additional data would create an additional burden to the participant, but it could yield a better understanding of how pet ownership benefits college students.

Zasloff and Kidd (1994) collected data in a more traditional manner, questionnaires, to compare the effects of pet ownership and pet attachment on loneliness. The sample consisted of both undergraduate and graduate female students with a mean age of 28.4 years, older than a typical undergraduate student. Neither adjustment to college nor

academic success were addressed in this study. The authors speculated that pet ownership did not mediate loneliness in such a young age group, even though they were older than most undergraduate students.

These were the only studies that compared college age pet owners with non-pet owners, while studies of the adult population have compared pet owners on health and well-being (Dembicki & Anderson, 1996; Headey, 1999; Lawton et al., 1984; Ory & Goldberg, 1983). Pets have been described by adult populations as sources of motivation to get up each day and to help maintain a regular pattern of activities (Dembicki & Anderson, 1996). It seems that pets could serve a similar function for college students who are expected to self-regulate themselves to attend classes and study in order to achieve academic success in college. No studies on the role of pets on success in college have been reported.

The studies of college age students described thus far have used nonexperimental designs. Each study contributes to the overall understanding of HAI, particularly in college students. However, experimental studies are stronger in terms of demonstrating causal relationships between and among independent and dependent variables (Kerlinger, 1986). It is unknown whether or not college students who keep pets are better adjusted to college and are more successful academically than those without pets.

The next group of studies of pets and college students are either quasi-experimental or experimental design. A quasi-experimental study with dogs and depressed college students demonstrated that scores on the Beck Depression Inventory improved following interaction with an unfamiliar dog (Folse, Minder, Aycocock, & Santana 1994). The control group in this study was much larger than either of the treatment groups and

consisted of participants who could not meet at the time designated for the treatment groups. The findings of this study demonstrated that pet interaction could be beneficial to a group of depressed college students. Similarly, Wilson (1991) established that the presence of a dog lowered state anxiety more than either reading quietly or reading aloud in a sample of college students. Both of the above studies addressed the emotional state of college students and the potential beneficial effects of interacting with a dog. However, neither addressed how the treatment conditions (presence of dog) influenced adjustment to college.

Two studies of male college students and dogs did not yield significantly different findings between having a dog present during a stressor or not (Grossberg, Alf, & Vormbrock, 1988; Straatman et al., 1997). One study used a sample of dog owners and allowed half of the participants to have their dog present during the experiment (Grossberg et al., 1988). The other investigators recruited a mixed sample of dog owners and non-dog owners and used an unfamiliar, friendly dog with the experimental group (Straatman et al., 1997). The samples in both studies were small (N = 36 and N = 32). Gender differences on the benefits of HAI have not been determined and may be an unexplored confounding variable. Data on pet attachment and attachment tendency were not collected in either study. None of the studies with college students addressed the beneficial effects of being a pet owner while attending college, particularly adjustment to and persistence in attending college.

Differences between male and female college students have not been extensively investigated, but could partially explain the lack of significant finding in the all male samples used by Grossberg, Alf, and Vormbrock (1988) and Straatman, Hanson,

Endenburg, and Mol (1997). Most HAI researchers have used mixed gender samples. All studies in this review with the exception of Grossberg and colleagues (1988) and Straatman and colleagues (1997), have used either samples of all female participants or mixed gender samples. A limited number of all HAI investigators have compared males and females on pet attachment. Females have been found to be more attached to their pet than males (T. P. Johnson, Garrity, & Stallones, 1992; Marks et al., 1994; Raina et al., 1999). Gender was found to have a moderate effect size on attachment in a review of 12 articles on pet attachment (Herzog, 2007). Gender differences may be a partial explanation as to the inconsistent findings of the benefits of pet ownership/interaction.

Three studies have addressed the concept of attachment in college students as related to HAI (Kurdek, 2008; Shore et al., 2005; Staats et al., 1999) Kurdek's (2008) findings that dogs were important to college students were consistent with those reported by Shore, Douglas, and Riley (2005), in that pet owning college students who were highly attached to their pets were also very involved in their care, so much that they were likely to provide extensive, elaborate care to their pets. Along similar lines, stronger attachment to one's pet was associated with improved personal health, but also that "multiple paths by which human interactions with pets may lead to positive human health behaviors and well-being" (Staats et al., 1999). The multiple paths involved a combination of both attachment and commitment to the pet, as well as pet care behaviors. These studies are consistent with other studies of adult samples that demonstrated that pets are like family members (Barker & Barker, 1988; Berryman et al., 1985; S. P. Cohen, 2002) and are associated with positive health behaviors (W. P. Anderson et al., 1992; Serpell, 1991).

Yet, none of the studies of college students and pets have focused on the goal of college attendance, adjustment to and success in college.

The previous discussion has presented a summary of HAI research and discussed the limited number of studies specific to college students and the fact that none are related to the ability of a pet to serve as a transitional object during times of stress. The next section will address the concept of attachment. It will begin with a discussion of attachment theory, followed by a discussion of attachment as it relates to college students and attachment related to pet ownership.

### *Attachment Theory and Application*

*Overview of Attachment Theory.* Attachment in humans was first described by Bowlby and Ainsworth in the early 1900's in relation to how a child reacted outwardly when separated from its mother and associated inner neuropsychological processes (Bretherton, 1992). According to attachment theory, the mother or other attachment figure served as a secure base for the child during times of distress. During times of distress, the attachment response was said to be 'activated' and the availability of a secure base influenced the response by the child. Initially, responses were categorized as secure or insecure. Following further research, the insecure category was further divided into avoidant and ambivalent/anxious tendencies, creating three attachment tendencies (Bretherton, 1992). Subsequent researchers have determined that four categories 1) secure, 2) preoccupied, 3) fearful, and 4) dismissive best describe attachment tendencies (Bartholomew & Horowitz, 1991). Those with secure attachment have a positive view of themselves and others; those with preoccupied tendencies have a negative view of themselves and positive view of others; those with fearful tendencies have a negative



view of themselves and negative view of others; those with dismissing tendencies have positive view of themselves and negative view of others (Searle & Meara, 1999). The emotional experiences of the four attachment patterns have been noted to be distinctly different (Searle & Meara, 1999). Gender differences within categories have yielded inconsistent findings, but at present it generally is believed that gender differences are between attachment tendencies rather than within (Searle & Meara, 1999; Sorokou & Weissbrod, 2005).

Attachment tendencies generally are stable over time. However, two periods of “normative shift in attachment” have been identified. One period is between the age of three and four; the other is during adolescence (Ainsworth, 1989). Adolescence is characterized by many changes including a move to operational thinking, greater differentiation between self and others, transition from care recipient to possibly care giver, along with the expected hormonal changes that occur (Ainsworth, 1989). “Yet research is increasingly showing that adolescent autonomy is most easily established not at the expense of attachment relationships with parents, but against a backdrop of secure relationships that are likely to endure well beyond adolescence” (J. P. Allen & Land, 1999, p. 319). Studies of college students have supported this statement by demonstrating that adjustment to college involves maintaining relationships with parents while establishing a new mature identity (Bernier, Larose, Boivin, & Soucy, 2004; Lopez, 1996; Rice, FitzGerald, Whaley, & Gibbs, 1995).

Some attachment researchers consider the transition to college the equivalent of the “strange situation” that was described in the toddler age group and served as the basis for the early infant attachment studies (Rice et al., 1995). Due to the merging of students

attending college and professors conducting research, there have been many studies regarding attachment and college age students. Those with secure attachment to parents tend to adjust better to college (Bernier et al., 2004; Lopez, 1996; Rice et al., 1995). The findings of these studies have been useful to college counselors but have not been utilized extensively by student affairs personnel responsible for planning freshmen orientation and retention programs, except in one study which will be discussed later in this section (Howard, Morey, & Briancesco, 2003). It is reasonable to suspect that attachment tendencies may influence a student's adjustment to and persistence in college.

*Research Related to Attachment and College Students.* Attachment has been assessed in two different, but similar, manners. One is to assess an individual's attachment tendency, based on either three or four categories described previously. The other is to assess attachment on a continuum that ranges from secure to insecure without differentiating the attachment tendencies. While both methods of assessing attachment yield valuable information, the four category attachment method will serve as the basis for the current study, because it is most commonly used in studies of attachment and adjustment to college..

The following discussion of previous attachment research will include a brief discussion of the study, evaluation of the study, and application of the findings to the current study. Studies are not presented in table format as most used similar methodologies (survey) and samples (college students).

Two studies addressed stability of attachment tendency in college freshmen (Davila, Burge, & Hammen, 1997; Lopez & Gormley, 2002). Davila and colleagues (1997) followed participants (N = 138) for two years, while Lopez and Gormley (2002)

assessed attachment tendency for six months. Eighty percent of the participants in Davila and colleague's sample demonstrated stable attachment tendencies, while 57% of participants maintained the same attachment tendency in Lopez and Gormley's study. The categorization of attachment tendency change varied between the two studies. The authors of both studies concluded that changes in attachment tendency were more likely to be related to internal personality factors than life circumstances and events.

Rice, FitzGerald, Whaley, and Gibbs (1995) categorized attachment as either secure or insecure in a study of students in their freshman and junior years of college. Attachment to parents was stable across time for all participants. Gender differences were noted; women reported higher degrees of trust and communication with peers than male participants, similar to the other studies (Fass & Tubman, 2002; Rice et al., 1995). No differences between gender and social adjustment to college were found. The majority of attachment researchers seem to consider attachment to be relatively stable over time. Further understanding of stability and change in attachment tendencies is yet to be determined conclusively.

Attachment tendencies tend to be 'activated' in times of stress (Ainsworth, 1989); the transition to college is a stressful time for most college freshmen. Some individuals seek the support of others at these times, while others do not; these actions can be explained by attachment theory. Individuals who view others positively (secure and preoccupied) would be more likely to seek assistance or guidance, while those who view others negatively (fearful and dismissing) would not seek outside resources.

The response of individuals respond to stressful situations has been shown to vary based on attachment tendency. Kemp and Neimeyer (1999) found that college students

(N = 193) with secure attachment tendencies demonstrated significantly lower levels of persistent thoughts about a stressful experience and greater levels of consistent support than the other three insecure attachment tendencies. Seeking social support in such instances was not significantly associated with secure individuals, as was hypothesized. The authors explained that it could be due to the fact that participants were asked to consider a stressful experience from the past and that relatively benign experiences may have been selected (Kemp & Neimeyer, 1999). Differences among the other three attachment tendencies were found, but were not as profound as hypothesized. It is possible that if the participants were asked to consider their first experience with college life (more stressful), the findings might have been significant. This study is one of the few studies on college students and attachment that have collected data using a method besides survey methodology. While adjustment to college was not the focus of the study, the findings could lead to further study in understanding how college students deal with the adjustment to college.

Coping styles and constructive thinking have been studied in relation to attachment tendency (Lopez, 1996; Lopez, Mauricio, Gormley, Simko, & Berger, 2001). Among the key findings was that anxious participants were more likely to use reactive coping strategies than suppressive coping (not acknowledging the problem) strategies (Lopez et al., 2001). Appropriate strategies to assist college students may differ based on the attachment tendency of the student. For example, those with anxious attachment tendencies would not seek the assistance of others during stressful periods. Consistent with previous studies, gender differences were not identified (Lopez et al., 2001).

Constructive thinking is a concept related to attachment and is considered to be related to practical intelligence and general coping ability (Lopez, 1996). The effect of childhood emotional bonds and attachment orientation on constructive thinking was studied in college students (N = 145). Attachment style was determined to have a mediating effect on constructive thinking. Participants with avoidant and fearful attachment styles were associated with lower ability in constructive thinking. The above studies (Kemp & Neimeyer, 1999; Lopez, 1996; Lopez et al., 2001) demonstrated that an individual's response to stress may differ by attachment style. The differences in responses to stress would seem to necessitate a need for a variety of strategies to promote adjustment to and retention in college.

The role of attachment on adjustment to college has been the topic of several studies. The next section will discuss research reports on the influence of attachment tendency on adjustment to college.

*Attachment and Adjustment to College.* Mattanah, Hancock, and Brand (2004) used structural equation modeling to analyze data regarding attachment, separation-individuation, and adjustment to college in a sample of college students (N = 404). The findings indicated that secure attachment to parents and healthy individuation was predictive of positive adjustment to college. They determined that separation-individuation mediated the effect of attachment on adjustment (Mattanah, Hancock, & Brand, 2004). Similarly, Schwartz and Buboltz (2004) looked for a direct relationship between attachment to parents and psychological separation in a study of college students (N = 368). Their findings did not support their original hypothesis that secure attachment to parents would be associated more closely with psychological separation. Instead,

separation was determined to be multidimensional. The findings demonstrate that a balance between trust, communication, and attachment is necessary in order for college students to separate from their parents successfully. These findings (Mattanah et al., 2004; Schwartz & Buboltz, 2004) are consistent with Allen and Land's (1999) belief that successful transition to adulthood is based on a history of secure parental relationships.

The adjustment to college involves both social and personal features. In a survey of college students (N = 156), Lapsley and Edgerton (2002) studied the association between attachment style and adjustment to college. Two aspects of adjustment to college were evaluated, social adjustment and personal emotional adjustment. Those with fearful and preoccupied attachment tendencies were associated with less than ideal adjustment, while those with secure attachment tendencies adjusted better than those with insecure tendencies. Participants with a dismissing attachment style did not demonstrate a significant correlation with college adjustment (Lapsley & Edgerton, 2002). While neither academic achievement nor college persistence were considered, Lapsley and Edgerton (2002) demonstrated differences in adjustment by attachment style that are similar to other studies of college students. Rice et al. (1995) demonstrated similar findings when college students (N = 81) were ranked on a continuum of high (secure) to low (insecure) attachment. Generally, students with high levels of attachment to parents and peers demonstrated better adjustment to college than those with insecure attachment.

The majority of studies related to attachment and adjustment to college have been either cross-sectional or only spanned the first year of college. A limited number of longitudinal studies have been conducted. Larose, Bernier, and Tarabulsy (2005) conducted a longitudinal study from the end of high school and through the first three

semesters of college. This allowed for a baseline measurement as well as follow-up beyond the first year. In this study, three concepts were evaluated, attachment, learning dispositions, and academic achievement. The results indicated that autonomous (secure attachment tendency) students were more likely to be successful in college than either dismissing or preoccupied students (total N = 62). Preoccupied students were more likely to fear failure, avoid seeking help from instructors, and gave less priority to their studies, while dismissing students decreased in examination preparation time and quality of attention (Larose, Bernier, & Tarabulsy, 2005). Although the sample was small, this study demonstrates that student success may vary by attachment style and provides support for why one size fits all type of student services is not adequate.

Another longitudinal study followed students for four years, while focusing on first year college retention (Howard et al., 2003). Participants from each of the four attachment styles were recruited for the study (Total N = 84). Most attachment studies have used a convenience sample intended to be representative of the general population. Equal representation of each attachment style and both genders helps to strengthen these findings. The findings demonstrated that those with fearful attachment tendencies had fewer friends and were lonelier than those with the other three attachment tendencies. Fearful respondents also reported more visits to the student health and campus counseling resources. Re-enrollment in the subsequent three years in the fearful respondents ranged from 50-60%, compared to 68-90% in the other three attachment tendencies (Howard et al., 2003). Both longitudinal studies demonstrated that retention strategies should vary based on student needs, specifically attachment tendency.

The impact of attachment on persistence in college and academic performance has been the focus of several studies. Perrine reported the results of two studies of college students' persistence and attachment during the first semester. The initial study evaluated attachment style, perceived stress, college persistence, and grade point average (GPA) in freshmen college students (N = 97) (Perrine, 1998). Results for the insecure attachment tendencies were not significantly different and were combined for comparison with students exhibiting a secure attachment style. Participants with an insecure attachment style demonstrated significantly higher levels of stress and were twice as likely to not persist to the next semester (5.3% versus 13.6%); the GPA of insecure individuals who did not persist was not passing, less than a 2.0 GPA (Perrine, 1998). Perrine's (2001) second study evaluated attachment, perceived stress, social support, persistence, and GPA in a larger sample of college freshmen (N = 171). Participants who did not persist were most likely to have a fearful attachment style, but it was not significantly higher. Additionally fearful participants reported significantly more stress and less support (perceived) than participants with the other three attachment styles. The findings revealed that support mediated the relationship between attachment and stress. Thus far, studies of attachment tendency and success in college have demonstrated that those with insecure attachment tendencies are more likely to encounter difficulties in college.

In another study of social support, attachment was the primary variable attributed to a positive perspective on the outcome; social support was influential but only when considered in broad perspective (Moller, Fouladi, McCarthy, & Hatch, 2003). Academic-at-risk students (N=102) were studied regarding attachment, parental control, and adjustment to college during their first year (Bernier et al., 2004). The findings showed



that those with a preoccupied attachment style demonstrated less positive adjustment overall and to college, as well as lower academic performance than other attachment styles. Only four participants were described as having a preoccupied attachment style, thus limiting the usefulness of these findings (Bernier et al., 2004).

Social support has been found to have a mediating effect in situations, such as health and compliance with a treatment program (S. Cohen, Gottlieb, & Underwood, 2001). Social support may not be helpful for all attachment tendencies. Recall that those with fearful attachment tendencies have a negative view of both self and others. Therefore, they will experience difficulty utilizing both peers and college staff as sources of support. One would also expect that participants with dismissing tendencies would have problems seeking support (Howard et al., 2003); Perrine (2001) did not demonstrate similar findings.

Based on the studies discussed above, it seems that facilitation of college student experiences should be based on building on positive aspects (strengths) of a student's past, in addition to minimizing the traumatic events related to starting college. The studies discussed in the previous section demonstrate that those with secure attachment tendencies are more likely to succeed in the social and academic adjustment to college. The process of adjustment to college is not well understood and most likely involves a variety of pre-existing and situational factors.

*Attachment and Human-Animal Interactions.* Attachment as related to pet ownership has been addressed in a number of HAI studies, but very few have been based on human attachment theory as described above (L. Beck & Madresh, 2008; Colby & Sherman, 2002; Kurdek, 2008). Various perspectives on attachment have been noted in

both research and non-research HAI publications. One study did assess attachment tendency in a sample of nursing home residents (Colby & Sherman, 2002). Following interaction with a dog, the mood of nursing home residents with secure attachment tendencies improved and did not improve in those with fearful avoidant tendencies. In fact, feelings of depression increased in those with fearful avoidant tendencies. All individuals do not have an affinity for either pet interaction or pet ownership, but how one comes to either like or dislike pets is not understood. Most likely it is based on a variety of factors, including personal predisposition, and past experiences (A. M. Beck & Katcher, 1996).

Another study based on attachment theory, Kurdek (2008) assessed how pets were perceived as an attachment figure by three samples of college students (N=923). All participants demonstrated that their pet was a valued part of their family. Although these two studies are quite different in their approach, they each contribute to one's understanding of attachment to a pet. Colby and Sherman (2002) demonstrated that participants with different attachment tendencies responded differently to a pet intervention, similar to studies that demonstrated that adjustment to college differed by attachment tendency. Therefore, pet owning college students may possess different attachment tendencies than non-pet owning college students. Additionally, pets may be important to college students and it is plausible that they could enhance a student's adjustment to college life.

Beck and Madresh (2008) applied attachment theory to pet relationships and tested adaptations of two widely used attachment measures. They compared responses about relationships with pets with those of romantic partners. Pets were found to be a

more constant source of attachment than the romantic partners. Additionally, the attachment measures that were adapted were found to be useful in assessing attachment to a pet.

Two non-research articles on pet attachment were based on specifically on attachment theory (Rynearson, 1978; Sable, 1995). Most other non-research articles have considered attachment similar to Voith (1985), that is as “an emotional state or feeling or behaviors to keep another in close proximity.” This definition parallels the concept of attachment as previously outlined and can be applied to both the experience of a college student leaving home and the experience of being separated from one’s pet.

Previous HAI research studies have addressed the concept of attachment without explicitly applying attachment theory. Attachment was measured using one of the existing pet attachment instruments (Fritz et al., 1996; Heath, Kass, Beck, & Glickman, 2001; R. A. Johnson & Meadows, 2002; Marks et al., 1994; Ory & Goldberg, 1983; Raina et al., 1999; Roberts, 1994) or by simply ranking attachment on an ordinal scale (Baun et al., 1984; Shore et al., 2005).

In summary, attachment theory has been utilized to better understand how college students adapt and succeed in college, but attachment theory has had limited application in studies of the human-animal bond. No studies could be located that addressed attachment, pets, and college students. The next section will describe the theoretical model of college student departure that will be used to guide the current study.

#### *Tinto’s Model of Student Departure*

First time college freshmen experience both academic and social adjustment during the first semester of college. Unsuccessful adjustment in either the academic or

social realm can lead to student attrition (Smith & Brackin, 2003). Maintaining a balance between the academic demands of college coursework and the social demands of the college experience presents considerable challenges for most college freshmen (Erickson, Peters, & Strommer, 2006). They find themselves being pulled in at least two directions. “Most of them desperately want to fit into their new environment and what, for all practical purposes, is their new life. On the other hand, many of them are desperately homesick, longing for known routine, old friends, and familiar faces” (Erickson et al., 2006, pg. 18).

Understanding first year college students and what leads to retention and eventual graduation has been the topic of numerous studies. High school GPA and standardized test scores would seem to be strong predictors, and they have been determined to be influential, but not necessarily significant predictors of retention (Harackiewicz, Barron, Tauer, & Elliot, 2002). As a result, studies have been conducted to determine the effects of personality, emotional, and social factors on student success. Academic and personal adjustment to college were found to be better predictors of attrition from college than academic performance factors (Gerdes & Mallinckrodt, 1994). Personality and precollege characteristics were found to influence both quality of effort and first year academic performance (Bauer & Liang, 2003). Students who were conscientious and open to new experiences were more likely to be successful with the college experience. These personality traits also influenced the extent of effort expended toward both academic and social activities in the first year of college. “The establishment of social relationships, orientation to a new environment, and physical comfort are important facets of a student’s transition to college” (Bauer & Liang, 2003, pg. 287). This indicates

that there are numerous factors that influence whether or not a student voluntarily leaves college or persists to subsequent semesters with eventual graduation.

*Summary of Tinto's Framework.* Multiple theoretical frameworks related to student retention exist (Pascarella & Terenzini, 2005). The theories are based on a variety of disciplines, such as psychology, developmental psychology, and sociology and have experienced varying degrees of acceptance by researchers, educators, college student personnel, and administrators. No one theory of student retention has received more widespread acceptance than the others. One theoretical framework that has been used to explain individual student departure from college addresses both the social and intellectual aspects of the transition to college is Tinto's Model of Individual Departure from Higher Education (Figure 2). While using the term departure in the title, the model can just as easily be used to describe adjustment to and persistence in college and has been used as such in numerous studies (Pascarella & Terenzini, 2005; Tinto, 1987). The model is intended to describe voluntary departure rather than those who must leave for academic reasons. In addition, it can be used to understand the multitude of factors that impact students' college experiences. The holistic nature of this model provides a framework for the current study. The model allows for multiple explanations for either departure from or persistence in higher education. While being very broad, this model is realistic in that it takes into account the multitude of factors that go into a student's success in college.

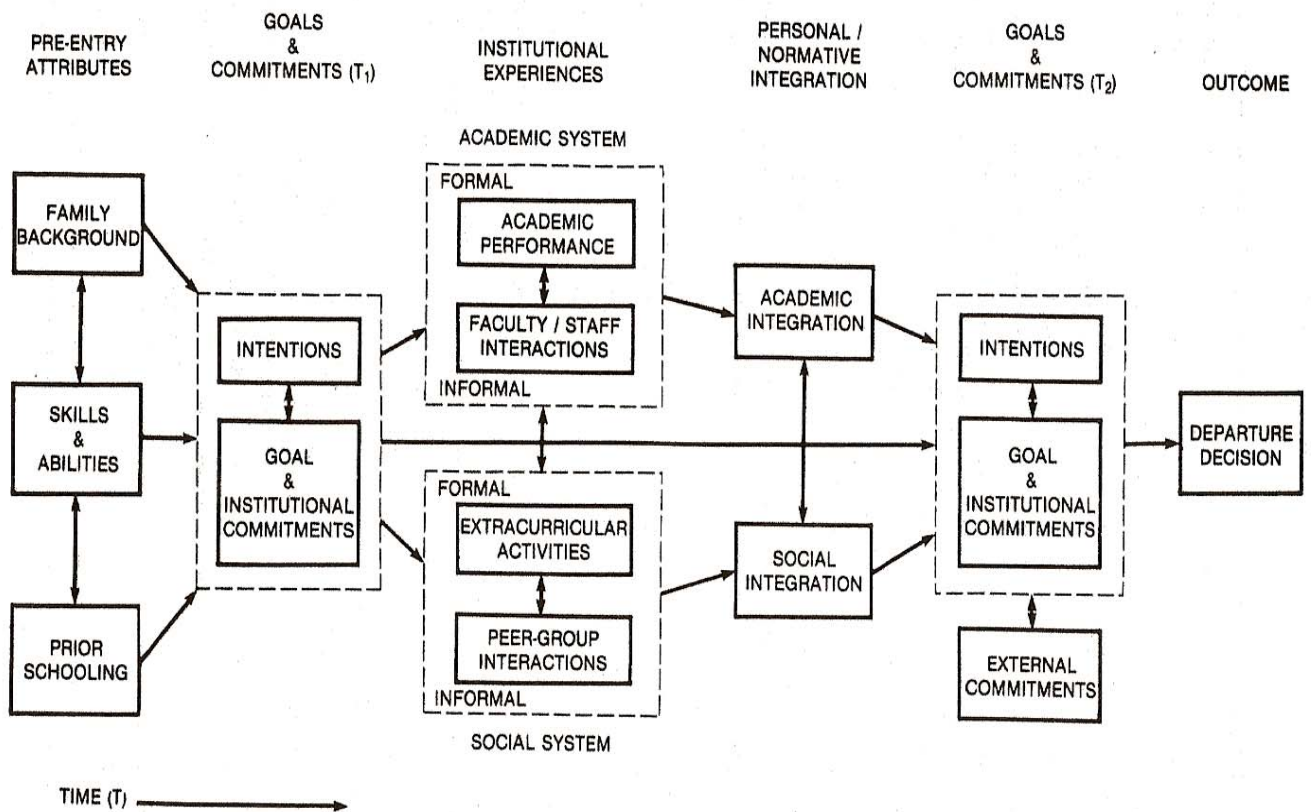


Fig. 4.1 A model of institutional departure

Figure 2: Tinto's Model of Institutional Departure

Individuals bring a variety of differing experiences with them to the college setting which may influence whether or not they persist in college. Tinto (1987) described several pre-entry attributes that can influence either success or failure in college. These include family background, skills and abilities, and previous educational experiences (Tinto, 1987). Family and community background includes social status, birth order, size of home community, and high school size. Skills and abilities include personality, value orientations, and intellectual, social and emotional characteristics.

Prior schooling includes factors such as previous educational experiences (high school and other colleges) and grade point average from previous academic endeavors. The broad range of background experiences influences each other as well as the goals and degree of commitment to one's education at the beginning of the college education experience ( $T_1$ ).

The goals and commitments portion ( $T_1$ ) of the model includes both intentions and goals and institutional commitments. Commitment involves commitment to the institution, as well as commitment to one's academic goals. The stronger one's intentions are and the higher one's goals are, the greater is the likelihood of completion of college than if intentions and goals are lower. A student's background, goals and commitments set the stage for the experience of attending the college (Tinto, 1987).

The college experience includes both academic and social experiences. Within both the academic and social experience are formal and informal opportunities for integration within the college environment. Class attendance, class participation, and academic success are formal means, whereas informal interactions with faculty provide informal means of academic integration. Organized extracurricular activities provide a formal means of social integration, while casual student-to-student interactions serve as an informal means of social integration.

Personal/normative integration is the goal of the college experience. Ideally, both academic and social integration will occur, resulting in academic success. Tinto (1987) believed that academic integration can occur without social integration, but the likelihood of persistence is decreased. Additionally, integration is not a dichotomous variable. Instead it occurs on a continuum ranging from the student with very little to no

integration to the college experience to one who is highly integrated/involved in the college experience. As both social and academic integration increases, one's commitment to the institution also increases, resulting in greater likelihood of persistence to graduation.

When both academic and social integration occurs, the student is able to meet his/her goals and commitments ( $T_2$ ), as well as external commitments to family and employers. The outcome as described in the model is "departure" meaning that integration has not been successful and that commitments to academic success have not been met. On the other hand, when goals and commitments to one's education are met, the outcome will be persistence in college.

External commitments also influence how one's goals and commitments are achieved. The temporary nature of the college environment makes the college experience particularly vulnerable to outside influences, such as family or economic crises (Tinto, 1987). External commitments are shown in Tinto's model as only influencing the outcome of goals and commitments at  $T_2$ . Narrative description of the model describes external commitments as influencing goals and commitments at both  $T_1$  and  $T_2$ . It is the opinion of the author that external commitments impact the entire academic experience. If a college student is employed for many hours, they are unable to become involved in activities outside of the classroom that promote both academic and social integration. They expend a great deal of time meeting external commitments, time that could otherwise be devoted to academic and social integration.

*Tinto's Framework Applied.* Colleges and universities typically do not allow pets in residence halls, other than small tanks for either fish or rodents. A limited number of



institutions of higher education are considered to be pet friendly (Table 1). The policy of allowing pets in residence hall fits with Tinto’s framework in several areas (Figure 3).

Previous pet ownership and attachment to the pet would be considered among the pre-entry attributes on the left side of the model. There are anecdotal reports of students moving from residence halls in order to keep a pet. While there are no reports of students leaving college in order to keep a pet, based on this model a student could miss a pet so intensely that they do not become socially involved in college life, resulting in a lack of social integration and eventually leave college. A pet can serve as a transitional object serving as an intermediary during times of change (Melson et al., 1997), such as attending college for the first time. Keeping a pet in the residence hall may help ease the transition to college by providing a familiar source of comfort to a student in an unfamiliar environment.

Table 1

*Colleges and Universities Known to Allow Pets in Residence Halls*

Name of School/Location	Type of Pet Allowed
Cal Tech, Pasadena, CA	cats
Eckerd College, St. Petersburg, FL	cats & dogs, must have owned for one year
MIT, Cambridge, MA	cats with consent of residents on the floor
State University of New York – Canton, Canton, NY	variety of animals
Stephens College, Columbia, MO	variety of animals
UCLA, Los Angeles, CA	cats with approval of all residents on the floor
University of Pennsylvania, Philadelphia, PA	variety of animals
Vassar College, Poughkeepsie, NY	variety of animals, requires 75% vote of residents
Washington & Jefferson College, Pittsburgh, PA	variety of animals

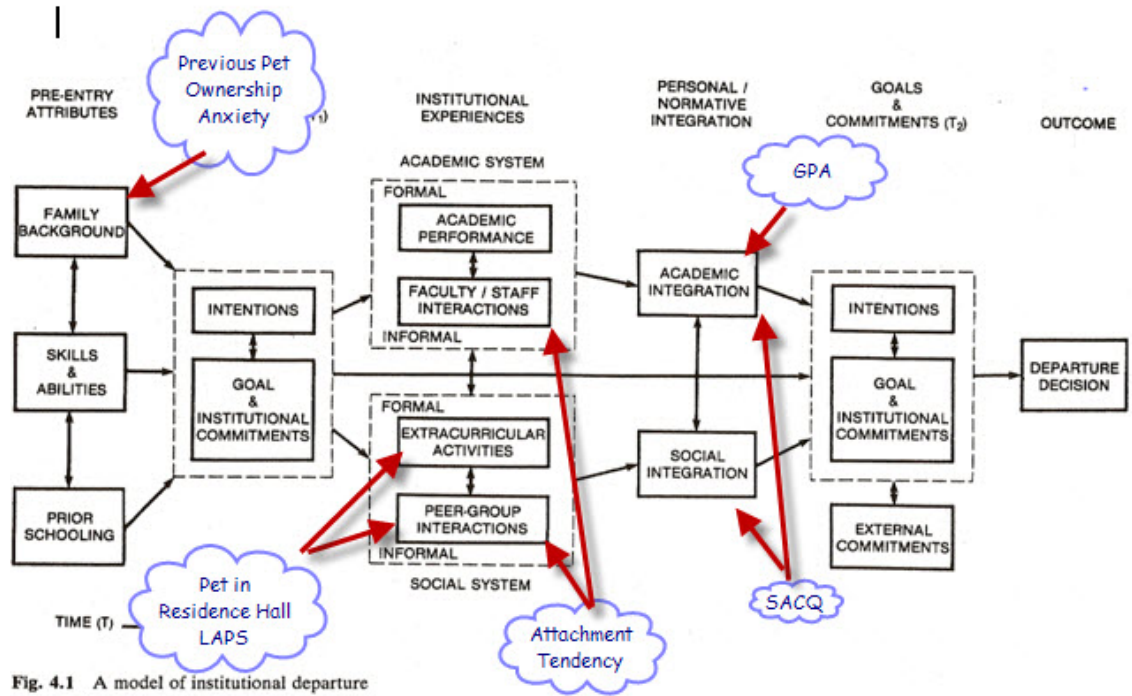


Figure 3: Tinto’s Model of Institutional Departure Adapted for Current Study

Pets have been described and found through empirical study to be social lubricants, meaning that they serve as a source of conversation between strangers, and can facilitate social interaction (Serpell, 2000). By keeping a pet in a residence hall, interaction among students may be facilitated and informal social integration may be enhanced. The pets may serve as a common bond among students living in the designated pet areas. At Stephens College, students keeping pets live either in a residence hall that has been designated as a ‘pet residence hall’ or on a floor of another residence hall designated for pet owners. The pet-keeping capacity at Stephens College may provide a formal organization to promote integration to college life, as well as an informal means to promote interactions. Pet residence halls and floors are similar to

freshmen interest groups (FIGS) and learning communities seen on other college and university campuses. These formal organizations promote camaraderie and social support among students resulting in social integration to college (Pike et al., 1997; Sidle & McReynolds, 1999). While keeping a pet in a residence hall may not influence academic performance directly, it may impact social integration into college. While no research has been done to establish the effect of having a pet in the residence hall, it is plausible that keeping a pet on campus could play a role in persistence in college.

Persistence in college leading to graduation is the overall goal of college retention programs. Colleges and universities have developed a variety of programs and courses intended to improve academic and social integration in first year college students. These programs have attempted to intervene by identifying risk factors that place a college freshman at risk for failure during the first year. Very few programs continue beyond the first year. Although most programs focus on demographic and academic factors, only slight improvement in retention and graduation has been noted; retention to the second year generally does not exceed 75% (Micceri & Wajeeh, 1999; Pike et al., 1997; Sidle & McReynolds, 1999). Studies have used demographic and academic factors to predict success in college, but even with sophisticated statistical procedures only a small extent of variance could be explained by such factors. A limited number of studies have focused on personal and emotional characteristics of the college students as they relate to persistence in college. As discussed earlier, adjustment to college differs by attachment tendency. No studies combining Tinto's theory and the concept of attachment could be found. Additionally, no studies were found based on Tinto's theory of student departure that considered a pet as part of social integration to college.

## Summary

The preceding review has served to demonstrate that while generally beneficial with most populations, there have been no studies related to the HAB and how college students adjust to and persist in college. There have been no HAB studies based on Tinto's Model of Departure from college. Additionally, HAB studies that address pet attachment are not explicitly based on attachment theory. Studies based on attachment theory have demonstrated that college students with insecure attachment tendencies have more problems during the transition to college than do students with secure attachment tendencies.

The purpose of this study was to evaluate the effect of keeping a pet in a residence hall on adjustment to college. The following research questions were answered:

1. To what extent is pet ownership among students living in residence halls associated with better adjustment to college, decreased state anxiety, higher grade point average, and stronger attachment to pets?
2. How do patterns of attachment tendencies differ between students who keep a pet in their residence hall room and those not keeping a pet?

Based on the above research questions, the following hypotheses will be tested.

1. Students keeping a pet in their residence hall room will demonstrate better adjustment to college than those living in a residence hall without a pet.
2. Students keeping a pet in their residence hall room will demonstrate lower state anxiety scores than those living in a residence hall without a pet.

3. Students keeping a pet in their residence hall room will demonstrate higher Stephens College grade point averages than those living in a residence hall without a pet.
4. Students keeping a pet in their residence hall room will demonstrate a greater tendency toward secure attachment style than those living in a residence hall without a pet.
5. Students keeping a pet in their residence hall room will demonstrate stronger attachment to pets than those living in a residence hall without a pet.

## Chapter III

### Design and Methods

The following chapter is a description of the research methodology used in the study. The first section will present the research methods used, including design, setting, participant recruitment, measures, and procedures for the study. The second section will address data management and analysis, followed by a discussion of limitations of the study and protection of human subjects.

#### *Design, Setting, and Participants*

*Study Design.* A descriptive, cross-sectional, two-group comparison design was used to compare students keeping a pet in a residence hall with those who do not, on measures of adjustment to college, attachment tendency, state anxiety, and grade point average (GPA).

*Setting.* Stephens College in Columbia, Missouri, is a predominantly female four-year private institution with an enrollment of approximately 900 students offering both undergraduate and graduate degrees ("NCA Response," 2008). All undergraduate students are required to live on-campus while attending the college. Eight residence halls provide a variety of living arrangements including community-style living (community bathroom), two room suites, and two room apartments (available to upperclassmen only).

The pet program began in 2004 in response to undergraduate students desiring to move off campus in order to keep a pet. It enables Stephens' students wishing to keep pets to live either in a residence hall that has been designated as a 'pet residence hall' or in another residence hall with a floor designated for pet owners. The residence hall areas for pet owners have community bathrooms and are not air conditioned. The maximum

number of students that could keep pets is 75 (D. Duren, personal communication, June 10, 2008). In the spring semester of 2009, there were approximately 50 pet owners (L. Arnold, personal communication, February 4, 2009). The students pay a refundable pet deposit of \$200 and must agree to regulations regarding appropriate pet care and pet behavior as outlined in the Pet Floor Program Agreement (Appendix B). Pet owners are expected to handle medical and behavioral issues with the pet (D. Duren, personal communication, June 10, 2008). If conditions of the Pet Floor Program Agreement are not met, representatives of college administration may require the pet owner to relocate the pet away from the residence hall.

Students may also serve as foster pet owners for an animal from a local animal rescue organization. The foster owners care for the foster pet, as if they were the owner, during the semester, in residence hall areas designated for pets. All conditions as outlined in the Pet Floor Program Agreement must be followed by the foster pet caregivers. Between semesters and at the end of the school year, the pets are returned to the animal rescue organization for care and possibly placement.

*Participants.* Students from both the pet-owning and non-pet owning populations were recruited for the study. Foster pet owners were included as pet owners. Additionally, students under the age of 18 were excluded due to inability to provide consent. The fact that undergraduate students were all female and were all required to live on-campus established a relatively homogenous sample, which strengthened the study design (Polit & Beck, 2008).

The following statistical criteria were selected: (a) level of significance 0.05, (b) power 0.80, and (c) medium effect size. A power analysis revealed that a sample size of

64 participants per group would be adequate to detect variation in the dependent variables for both *t*-tests and analysis of variance (J. Cohen, 1992). Achieving a sample size of 64 was not possible with a total population of 50 pet-owning students. Once pet owning participants were recruited, a matched sample of non-pet owning participants was recruited. Recruitment of an adequate number of non-pet owning students was less complex based on the fact that there was a larger population of non-pet owning students than pet owning students. A convenience sample of 25 matched pairs (total N = 50) was recruited.

Matching helped control for confounding variables of age and year in college (Polit & Beck, 2008). The two groups were matched on age and year in college. By matching participants on age and year in college, two similar groups were quite similar.

Procedures will be described subsequently in the recruitment section.

### *Recruitment*

Approval to conduct a study at Stephens College was obtained from the Dean of Student Services. The administrative assistant to the Dean of Student Services sent an electronic mail (e-mail) message to all residential undergraduate students and published information about the study in an electronic campus newsletter. Additionally informational fliers were posted at the entrance to the commons area and in the lobby of the residence hall that allowed pets. The content of the e-mail, a copy of the electronic newsletter and a sample flier can be found in Appendix C. Recruitment of participants occurred simultaneously with data collection during the week of February 2, 2009.

A non-probability sample of pet-owning students was recruited, followed by recruitment of matched (year in college and age) non-pet owning students. The sample of



pet owning students was recruited first through the mass e-mail and electronic newsletter described above. During each of the five days of data collection, the investigator was stationed at a table near the entry to the dining hall. Also nearby was a snack cart, bookstore, and post office. This location was a hub of activity, primarily during meal times. The data collection area was located in an area in which students waited for their friends before eating a meal. The area had couches as well as tables and chairs to create a casual, friendly environment. A colorful, informational poster was placed on the table to attract students' attention. Additionally, the investigator either stood or sat near the table. The investigator manned the study table during lunch and dinner hours for a total of approximately seven hours per day.

All residence hall lobbies are locked for security purposes, but the investigator was granted permission to be stationed in the lobby of the pet residence hall for two hours late in the afternoon on one day. The investigator also attended an activity planned for one of the floors of a pet residence hall by one of the residence hall advisors. The students, some with their pets, gathered to make homemade doggie treats and watch a movie entitled, "All Dogs go to Heaven."

Recruitment of pet owning students was carried on for two days. On subsequent days, both pet owners and non-pet owners were recruited. An ongoing list of participants' year in college and age was kept, along with their pet ownership status. As students would show interest in participating in the study, the investigator would inquire as to their pet ownership status. If the student had a pet in the residence hall, they were invited to participate. If the student did not have a pet, yet was interested in participating in the study, the investigator would check the list of already enrolled pet owning

participants for matches. Non-pet owning participants were matched to pet owning participants by year in college and age.

To avoid students participating more than once in the study, a list of all participants' names was kept as students completed the consent for participation. This list was checked for duplicate names before a participant completed the battery of questionnaires.

### *Measures*

All consenting participants completed the following instruments.

*Student Adaptation to College Questionnaire (SACQ).* SACQ is a 67-item self-report, commercially available instrument designed to assess how well a college student is adjusting to college. It consists of four subscales: Academic Adjustment, Personal-Emotional Adjustment, Social Adjustment, and Attachment to the Institution (Baker & Siryk, 1999). The SACQ uses an interval level of measurement with nine-point Likert-type responses. Thirty four items are reverse scored. Raw scores on the full scale range from 67 to 603. Scores for the subscales range as follows, (a) Academic Adjustment 24-216, (b) Social Adjustment 20-180, (c) Personal-Emotional Adjustment 15-135, and (d) Attachment 15-135. Higher scores indicate better adjustment to college. Scores on the full scale, as well as the subscales, have been used by counselors as part of an overall assessment of college students (Baker & Siryk, 1999).

For this study, both the composite score and the subscale scores were used to evaluate adjustment to college. The SACQ has been used both as a diagnostic tool and as a pre-test posttest measure with college freshmen (Baker & Siryk, 1999). A limited number of studies have been conducted with students beyond the freshmen year in college. The Cronbach alpha internal consistency score for the total scale was 0.92 to

0.94, Academic Adjustment subscale was 0.82 to 0.87, Social Adjustment subscale was 0.83 to 0.89, Personal-Emotional subscale was 0.73 to 0.79, and Attachment subscale was 0.84 to 0.88, and with six samples of college freshmen. The reported time for SACQ administration is 15-20 minutes. The SACQ and instruction manual was purchased from the Western Psychological Association. The purchased instrument is printed on an Auto Score Form™ with questions on both front and back pages. Responses are transferred via carbon paper between the sheets to a profile page located between the sheets of paper. Scoring was completed by hand using the Auto Score Form™ that is located between the sheets of the instrument. This allowed for ease in calculating both the composite score and those for each subscale. A copy of the instrument can be found in Appendix D.

The Academic Adjustment, Social Adjustment, and Attachment subscales are consistent with the concepts addressed in Tinto's Model of Student Departure (Tinto, 1987). The Attachment subscale refers to the degree of attachment to both college in general and to the college the student is currently attending. The Personal-Emotional Adjustment subscale is designed to assess both physical and psychological well-being. While not explicitly discussed in Tinto's model, Personal-Emotional Adjustment would be part of overall personal/normative integration leading to meeting one's academic goals and commitments.

*Relationship Questionnaire.* The Relationship Questionnaire (RQ) is a single item instrument designed to assess tendency for a particular attachment style (Bartholomew & Horowitz, 1991). Participants are asked to select which one of four brief paragraphs best describes their relationship with other humans. Additionally, participants are asked to identify how well each of the four paragraphs describes their

overall relationship style with seven point Likert-type responses. By using this format, attachment can be assessed both categorically (identifying best description) and continuously (assessing degree of description). The four attachment categories used in the scale were validated from the Interview of Peer Attachment in a sample of college students (N = 77) (Bartholomew & Horowitz, 1991). The RQ has been used frequently in studies of attachment with over 600 college students (Davila et al., 1997; Lapsley & Edgerton, 2002; Lopez & Gormley, 2002; Pistole & Arricale, 2003). Moderate stability of the categories at eight months has been reported (Scharfe & Bartholomew, 1994). The RQ can be completed in approximately five minutes. Scoring was completed by identifying which of the four categories the participant rated highest on the seven point Likert-type scale. If a participant rated their attachment equally to more than one attachment tendency on the Likert-type response, the categorical selection was used to break the tie. A copy of the instrument can be found in Appendix E.

The RQ was used to assess an aspect of peer group interaction as described in Tinto's Theory of Student Departure. Those with a positive view of others (secure or preoccupied attachment tendency) would be more likely to participate in social interactions, leading to social integration. A greater degree of social integration is associated with persistence in college (Tinto, 1987).

The RQ and SACQ have been used together previously to study adjustment to college and attachment tendency in a sample of college students (Lapsley & Edgerton, 2002). According to attachment theory, those with secure and preoccupied attachment tendencies have a positive view of others and should demonstrate better adjustment to

college than those with fearful and dismissing tendencies. Lapsley and Edgerton (2002) demonstrated that only those with secure attachment tendencies adjusted better to college.

*State-Trait Anxiety Inventory.* The State-Trait Anxiety Inventory (STAI) is a 40-item commercially available instrument with two subscales designed to measure temporary and stable long-term aspects of anxiety (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). Participants respond to how they feel at the present time (state) and how they generally feel (trait) using four-point Likert-type responses. Nine items were reversed scored on the state subscale and ten were reversed on the trait subscale. Scores for each subscale were obtained by summing the responses. Possible scores for each subscale range from 20-80. Higher scores indicate greater anxiety than do lower scores. The test-retest correlation for college students has been reported to range from 0.73 to 0.86 for the trait anxiety scale with a median reliability coefficient of 0.765 and 0.16 to 0.62 for the state anxiety scale with a median reliability coefficient of 0.33. Low test-retest reliability scores on the state anxiety scale were to be expected because the scale is designed to measure a transient concept of anxiety as it occurs at a particular moment in time. The STAI was purchased from Mind Garden, Inc. The instrument can be completed in approximately ten minutes. The STAI has been tested on over 5,000 high school and college students and has been widely used with adult samples of all ages. Scoring was completed by hand. Copyright regulations with this instrument prohibited including a copy of the entire instrument in the dissertation. Five sample items can be found in Appendix F.

Tinto's Theory of Student Departure does not address emotions such as anxiety explicitly. Instead emotions are included as part of one's family background which is a

pre-entry attribute. Family background influences other pre-entry attributes of skills and previous education, as well as one's goals and commitments at the time of entry to college (see Figure 1). The theory does recognize that an individual's emotional predisposition is part of an individual's goals and commitments at the time of entry into college (Tinto, 1987).

*Lexington Attachment to Pets Scale.* The Lexington Attachment to Pets Scale (LAPS) is a 23-item scale designed to assess emotional attachment to pets (D. C. Anderson, 2007). Three subscales have been identified, general attachment, people substituting (pet as central to the individual), and animal rights and welfare (T. P. Johnson et al., 1992). The LAPS used an interval level of measurement with four-point Likert-type responses. Two items were reverse scored. Scores can range from 23-92. Higher scores indicated stronger attachment to ones own pet. This instrument has an alpha coefficient of 0.928 with a sample of adults (N = 412) over the age of 18 (T. P. Johnson et al., 1992) . The Cronbach's alpha scores for the three subscales were: 0.90 for general attachment, 0.85 for people substituting, and 0.80 for animal rights/welfare. The LAPS was used with a sample of college students (N = 501) and was found to correlate ( $r = 0.76$ ) well with a semantic differential scale on pet attachment (Shore et al., 2005), while the Cronbach's alpha score was not reported. The total scale was used in this study. Scoring was completed manually. The length of time to complete the LAPS has not been reported, but a 23-item scale did not burden healthy college age students. All participants (pet owning and non-pet owning) completed the LAPS. The rationale was that 70-96.6 % of households with children have pets in the home (Kist & Johnson,

2008; Marks et al., 1994; Triebenbacher, 1998), thus college students may be attached to a pet, but not have the pet on-campus. A copy of LAPS can be found in Appendix G.

In Tinto's Theory of Student Departure, the pet would be considered as part of both formal and informal social experiences within the institution. The pet serves as a social lubricant by serving as a mediator for interactions (Serpell, 2000), thus enhancing social integration to the college experience.

*Demographic Questionnaire.* Subject demographic information included age, gender, ethnicity, previous pet ownership, age of first pet, age of first being responsible for a pet, type of pet, and intent to own a pet in the future. The demographic questionnaire was designed for both pet owning and non-pet owning participants. The demographic questionnaire can be found in Appendix H.

*Consent for Release of Grade Point Average.* Participants were asked to sign a consent form allowing the investigator to obtain their grade point average for courses taken at Stephens College. All students had attended Stephens College for at least one semester. Grades at Stephens College are based on a 4.0 scale. Students are expected to maintain a 2.0 GPA for continuation or they are placed on academic probation ("Academic Probation," 2008). A copy of this consent can be found in Appendix I.

The GPA along with the academic adjustment scale from the SACQ were used to assess the student's degree of academic integration as outlined in Tinto's Theory of Student Departure. While a minimum level of academic performance is necessary to continue in college, Tinto's theory focuses on students who decide to leave college, rather than being dismissed for poor academic performance (Tinto, 1987).

### *Procedure*

Data collection began with the pet-owning students, followed by matching with non-pet owning students according to year in college and age as detailed in the recruitment section. Data collection occurred during the week of February 2, 2009, Monday through Friday. Students interested in participating in the study and who met the inclusion criteria signed a consent form to participate in the study and a form granting permission to the Registrar to release the subject's GPA to the investigator. Participants completed the battery of questionnaires and received a \$6 coupon from a nearby restaurant.

When all data had been collected, a list of participants was generated and given to the Registrar in an electronic format, along with participants' consent forms in order to gain access to GPA data. The Registrar emailed the investigator an electronic file of student names and GPAs.

### Data Management and Analysis

#### *Data Management*

All consents and questionnaires were numbered consecutively. Students were assigned a study identification number upon completion of the questionnaires. This number was recorded on a list with the student's name for matching purposes and entry of GPA data.

Data were entered by the investigator into Statistical Package for the Social Sciences (SPSS) 16.0 and kept on a non-networked computer with a CD-ROM back-up. Data were checked for accuracy by double entering data and comparing the entries. Data were screened by checking frequency distributions for outliers and for consistency in



responses, using box plots and distribution plots. One non-pet owner was determined to have an extremely low score on the LAPS. The scoring on this instrument was double checked and found to be accurate. Data were analyzed both with and without this outlier. No differences were found in the results. Therefore, the data for this individual was included in all analyses allowing for 25 matched pairs with a sample size of 50 participants.

### *Data Analysis*

Descriptive statistics were computed based on demographic questionnaire responses in order to characterize the groups and to determine baseline differences between pet owning and non-pet owning groups. A samples such as the one in this study was considered to be dependent due to the matching procedure that was carried out during recruitment and data collection (Stevens, 1999). A Chi-square test for dependent samples was carried out to determine between group differences for pet owning and non-pet owning participants on nominal from the demographic questionnaire (Polgar & Thomas, 2000).

Scores for the SACQ, LAPS, and STAI were calculated manually, double checked by the investigator for accuracy, and entered into SPSS for analysis. The level of significance for all hypothesis testing was  $p \leq 0.05$ .

Each hypothesis was tested statistically as follows.

Hypothesis 1 - Students keeping a pet in their residence hall room will demonstrate better adjustment to college than those living in a residence hall without a pet. A *t*-test for dependent samples (one-tailed) was conducted comparing SACQ scores (total score and each of four subscales) of the pet-owning versus non-pet owning

participants. The dependent *t*-test (paired *t*-test) was used to compare two groups that have been matched, year in college and age, on selected characteristics, (Polit & Beck, 2008).

Hypothesis 2 - Students keeping a pet in their residence hall room will demonstrate lower state anxiety scores than those living in a residence hall without a pet. A dependent samples *t*-test (one-tailed) was conducted comparing both state and trait subscale scores of pet-owning and non-pet owning participants.

Hypothesis 3 - Students keeping a pet in their residence hall room will demonstrate higher Stephens College grade point averages than those living in a residence hall without a pet. A *t*-test for dependent samples (one-tailed) was conducted comparing GPA's of pet-owning and non-pet owning participants.

Hypothesis 4 - Students keeping a pet in their residence hall room will demonstrate a greater tendency toward secure attachment style than those living in a residence hall without a pet. A Chi-square test for homogeneity was conducted to test for association between pet ownership and attachment tendency. The distribution among the four attachment tendencies for the total sample, non-pet owners, and pet owners was determined. The distribution of each attachment tendency by year in college also was determined. These distributions were compared to what is considered to be typical in the general adult population using a Chi-square goodness of fit test. A commonly accepted distribution of attachment tendencies is 46.8% secure, 18.2% dismissing, 14.3% preoccupied, and 20.8% fearful (Bartholomew & Horowitz, 1991). By comparing the distribution of attachment tendencies with the general population a determination of normality can be made.

### *Human Subjects Protection*

Expedited approval from both the Stephens College Institutional Review Board (IRB) and MU Health Sciences IRB was granted. During subject recruitment, students were informed that the purpose of the study was to compare pet owning and non-pet owning students on a number of parameters, including attachment tendency, pet attachment, adjustment to college, anxiety, and GPA. The right to self-determination was preserved as students were not coerced into participating in the study. Students who chose not to participate were not penalized in any way and there was no cost associated with participation in the study.

Written consent (Appendix J) was obtained from each participant prior to completing the study instruments. A copy of the consent form was given to each participant. The content of the consent form provided for full disclosure of the purpose of the study and type of data collected. Contact information for the primary investigator and Health Sciences Risk Management Officer was included in the consent. The MU Health Sciences IRB determined that a Health Insurance Portability and Accountability Act (HIPAA) Authorization Form was not necessary, as no healthcare related information was being collected. Consent for Photographs (Appendix K) was signed by participants who agreed to be photographed with their pets.

The sample for the study was all female as Stephens College is a predominately female college. No attempts were made to specifically recruit students from minority groups; the representation of various ethnic groups in the sample was similar to that of the college.

Confidentiality was maintained through a variety of procedures. Participants were assigned an identification number at the time of data collection. The number was used to link a subject's questionnaire to their GPA. The names and identification numbers were recorded and kept in a locked cabinet that only the primary investigator could access. Files containing participant data were kept separate from the participant list. Data from any particular subject are not identifiable and are reported only in aggregate form. Data from individual participants were not publicly available.

Participants were expected to be truthful in their responses (veracity) while completing the study questionnaires. Benefits to participation in the study were a contribution to better understanding of how pets may or may not influence individual students in their adjustment to college. The risks to the subject were no greater than those encountered in daily life. There was a slight risk that while completing the study instruments painful thoughts might be triggered. Participants were informed via the consent that they could stop completing the questionnaires at any time. If a participant had become extremely upset while completing the questionnaires, she would have been referred to Student Health at Stephens College. Due to the low risk nature of the study and the greater understanding of the effect of pets on college students, the benefits from this study outweighed the risks involved in participation. All participants completed the questionnaires without incident.

Participants were compensated for their time with a small (\$6) gift certificate to a nearby restaurant. A gift certificate of \$6 was adequate to cover the cost of a sandwich at this food establishment. Participants were provided with both the phone numbers and e-

mail address of the investigator in case they had questions or wished to withdraw from the study. No participants contacted the investigator with concerns related to the study.

## Chapter IV

### Results

This chapter is divided into three sections, demographic characteristics of participants, current pet owner characteristics, and findings from hypothesis testing for each dependent variable. The key dependent variables were SACQ scores (total and subscales), anxiety scores (state and trait), GPA, attachment tendency, and LAPS scores.

#### *Demographics*

During data collection, participants were matched by age and year in college. Distributions by year in college and age according to pet ownership status can be found in Table 2. All participants (N = 50) were single female students. The academic majors of participants varied widely, representing 26 majors, but were similar between the pet owning and non-pet owning groups. Additional characteristics by pet ownership status of the entire sample can be found in Table 2. Characteristics specific to those who had pets as a child can be found in Table 3. Chi-square tests were used to assess differences between non-pet owners and pet owners on characteristics from the demographic questionnaire (Tables 2 & 3). No significant differences on participant characteristics were found, except for age at which participants became responsible for pet care (Table 3). All pet owning participants had responsibility for pet care while living at home, while 23.8% of non-pet owners had ever been responsible for a pet. Participants most commonly were responsible for a pet between the ages of five and nine. Of the pets owned as a child, dogs were most common type of animal (33 of 43 participants). Seven of 21 non-pet owners had owned multiple types of pets while living at home, while 12 of 22 pet owners had kept multiple types of pets. At the present time, only 3 of the 19 non-

pet owners had pets at home, whereas 11 of 22 pet owners had multiple types of pets at home.

Table 2

*Characteristics of Participants (N = 50)*

	Non-Pet Owners	Pet Owners	Total Sample	<i>p</i>
Year in College				0.990
<i>Freshman</i>	40% (10)	36% (9)	38% (19)	
<i>Sophomore</i>	32% (8)	36% (9)	34% (17)	
<i>Junior</i>	16% (4)	16% (4)	16% (8)	
<i>Senior</i>	12% (3)	12% (3)	12% (6)	
Age in years	19.52 ± 1.005	19.42 ± 1.152	19.47 ± 1.071	0.654
Number of siblings	2.25 ± 2.364	1.80 ± 1.528	2.02 ± 1.974	0.134
Ethnic background				0.497
<i>African American</i>	13.0% (3)	4.2% (1)	8.5% (4)	
<i>Asian</i>	4.3% (1)	0.0% (0)	2.1% (1)	
<i>Caucasian</i>	78.3% (18)	91.7% (22)	85.1% (40)	
<i>Hispanic/Latin</i>	4.3% (1)	4.2% (1)	4.3% (2)	
Pet at permanent residence	76.0% (19)	88.0% (22)	82.0% (41)	0.269
Plan to have a pet in the future	95.7% (22)	100.0% (25)	97.9% (47)	0.292
Frequency of visits to permanent residence				0.218
<i>Weekly</i>	0.0% (0)	20.0% (5)	10.2% (5)	
<i>Monthly</i>	16.7% (4)	8.0% (2)	12.2% (6)	

<i>Twice each semester</i>	45.8% (11)	40.0% (10)	42.9% (21)	
<i>Summer &amp; between semesters</i>	33.3% (8)	28.0% (7)	30.6% (15)	
<i>Yearly</i>	4.2% (1)	4.0% (1)	4.1% (2)	
Current living arrangement				0.342
<i>Single room</i>	87.5% (21)	88.0% (22)	87.8% (43)	
<i>2 or more roommates</i>	8.3% (2)	4.0% (1)	6.1% (3)	
<i>Apartment on campus</i>	4.2% (1)	0.0% (0)	2.0% (1)	
<i>Other</i>	0.0% (0)	8.0% (2)	4.1% (2)	

Numbers in parentheses represent observed values.

Table 3

*Characteristics of Participants who had Pet as a Child*

	Non-Pet Owners	Pet Owners	Total Sample	<i>p</i>
Had pet as a child	84% (21)	88% (22)	86% (43)	0.684
Age of recall for having pet				0.323
<i>1-12</i>	100% (21)	95.5% (21)	97.7% (42)	
<i>13-18</i>	0% (0)	4.5% (1)	2.3% (1)	
Age responsible for pet				0.035 *
<i>Never</i>	23.8% (5)	0% (0)	11.6% (5)	
<i>5-9</i>	47.6% (10)	45.5% (10)	46.5% (20)	
<i>10-14</i>	28.6% (6)	40.9% (9)	34.9% (15)	
<i>15-19</i>	0% (0)	13.6% (3)	7.0% (3)	

Numbers in parentheses represent observed values.



### *Characteristics of pet owners*

Pet owners were further described based on how long they had owned their current pet. Eight participants (32%) had kept their current pet for less than six months. Five participants (20%) had their pet between six months and one year. Two participants (8%) had their pet for 1 – 1 ½ years, while two (8%) more had their pet for 1 ½ - 2 years. Eight participants (32%) had owned their pet for more than two years. Of the types of pets kept in the residence hall, there were 13 dogs, 11 cats, and one rabbit. All pet owners had one pet in the residence hall.

### *Hypotheses testing*

Hypotheses were tested as described subsequently. The level of significance for all hypothesis testing was  $p \leq 0.05$ .

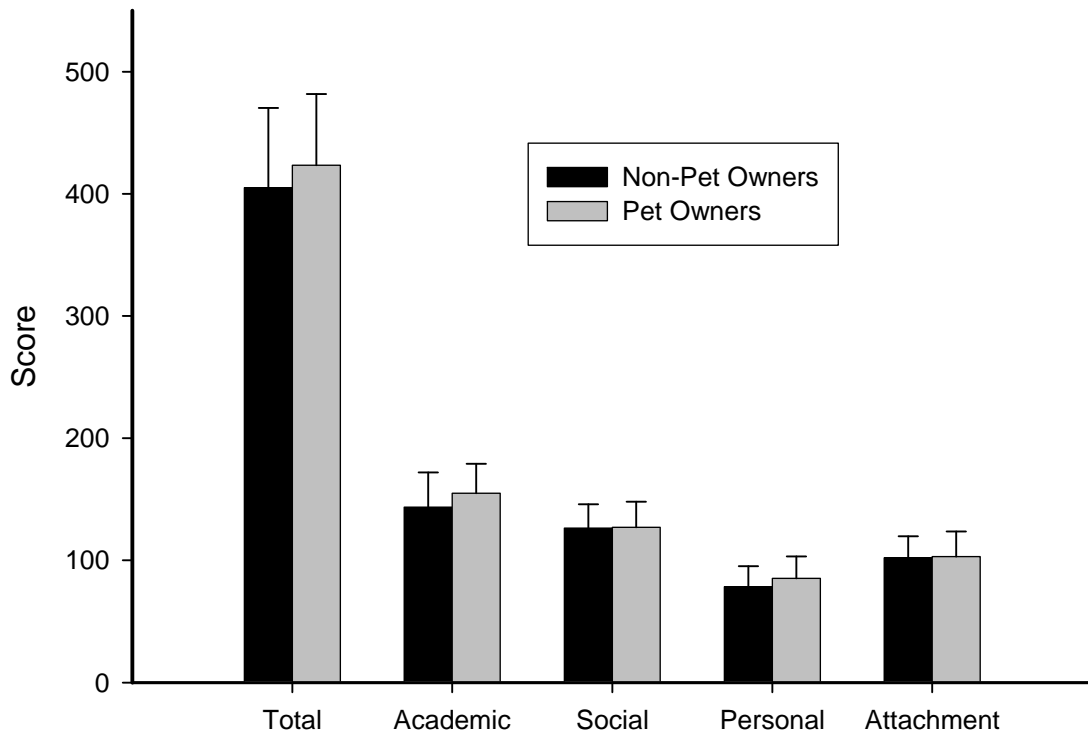
Hypothesis 1 – Students keeping a pet in their residence hall will demonstrate better adjustment to college than those living in a residence hall without a pet. Mean SACQ total and subscale scores primarily were slightly below the 50<sup>th</sup> percentile. The one exception was the mean Academic Adjustment subscale score for pet owners that was at the 62<sup>nd</sup> percentile. Mean scores for the SACQ total and each of the subscales were higher for pet owners than non-pet owners as predicted, but the dependent samples *t*-test did not demonstrate statistically significantly between group differences (Table 4, Figure 4). Therefore, hypothesis 1 was rejected. Students with pets did not demonstrate statistically significant better adjustment to college than those without pets.

Table 4

*Dependent Samples t-test for SACQ Scores (N = 50)*

	Non-Pet Owners	Pet Owners	t value (df = 24)	p
SACQ Total Score (mean)	404.9 ± 65.4	423.5 ± 58.2	-1.33	0.196
SACQ Academic Adjustment (mean)	143.6 ± 28.4	154.9 ± 24.2	-1.62	0.119
SACQ Social Adjustment (mean)	126.5 ± 19.4	127.0 ± 20.9	-0.101	0.920
SACQ Personal Emotional Adjustment (mean)	78.4 ± 16.8	83.5 ± 17.9	-1.259	0.220
SACQ Attachment (mean)	102.0 ± 17.7	103.0 ± 20.6	-0.280	0.782

Dependent Samples t-test for SACQ Scores



**Figure 4.** Values reported are means +/- standard deviations. There were no significant differences ( $p \leq 0.05$ ) by dependent samples t-tests.

Hypothesis 2 – Students keeping a pet in their residence hall room will

demonstrate lower state anxiety scores than those living in a residence hall without a pet.

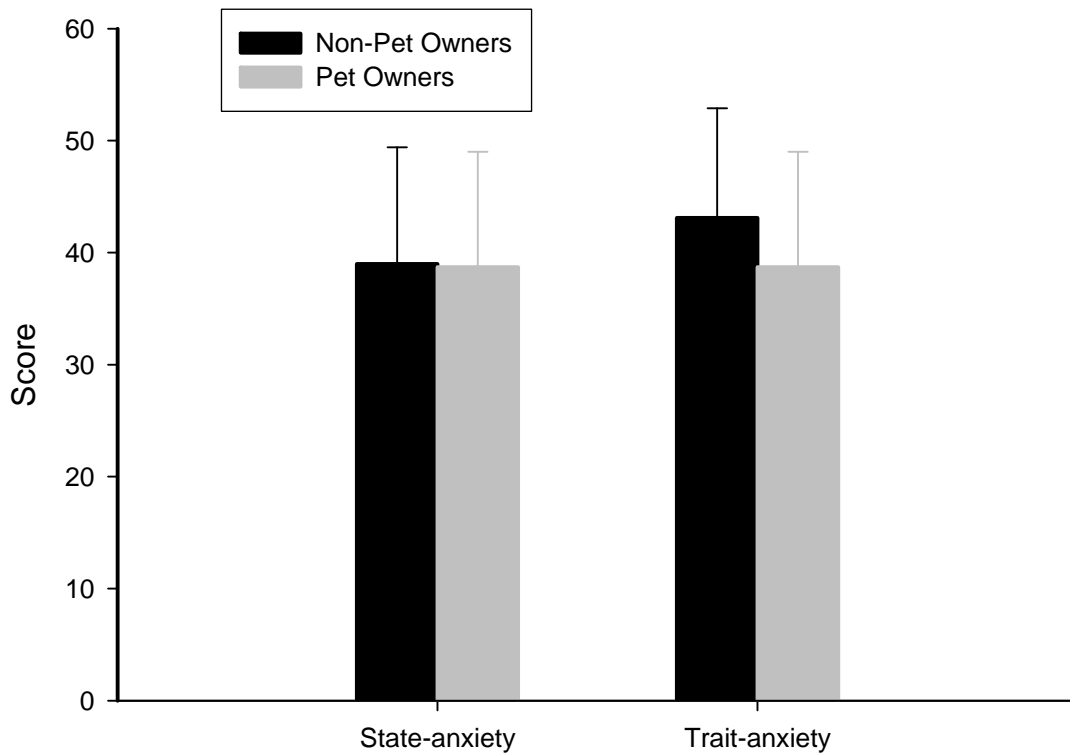
Mean state and trait scores were all higher than normed mean scores for college students (state = 36.47, trait = 38.3) (Spielberger et al., 1983). The mean scores were between the 65<sup>th</sup> and 80<sup>th</sup> percentile rankings, indicating higher than normal levels of both state and trait anxiety. Mean scores for both state and trait anxiety were lower for pet owners as predicted, but the dependent samples *t*-test did not demonstrate statistically significant between group differences (Table 5, Figure 5). The trait anxiety score approached statistical significance. Therefore, hypothesis 2 was rejected. Students with pets did not demonstrate statistically significant lower state anxiety scores than those without pets.

Table 5

*Dependent Samples t-test for State and Trait Anxiety Scores (N = 50)*

	Non-Pet Owners	Pet Owners	t value (df = 24)	<i>p</i>
State Anxiety (mean)	39.0 ± 10.4	38.7 ± 10.3	0.086	0.932
Trait Anxiety (mean)	43.1 ± 9.8	38.72 ± 10.3	1.824	0.081

## Dependent Samples t-test for State and Trait Anxiety Scores



**Figure 5.** Values are means +/- standard deviations. There were no significant differences ( $p \leq 0.05$ ) by dependent samples  $t$ -test.

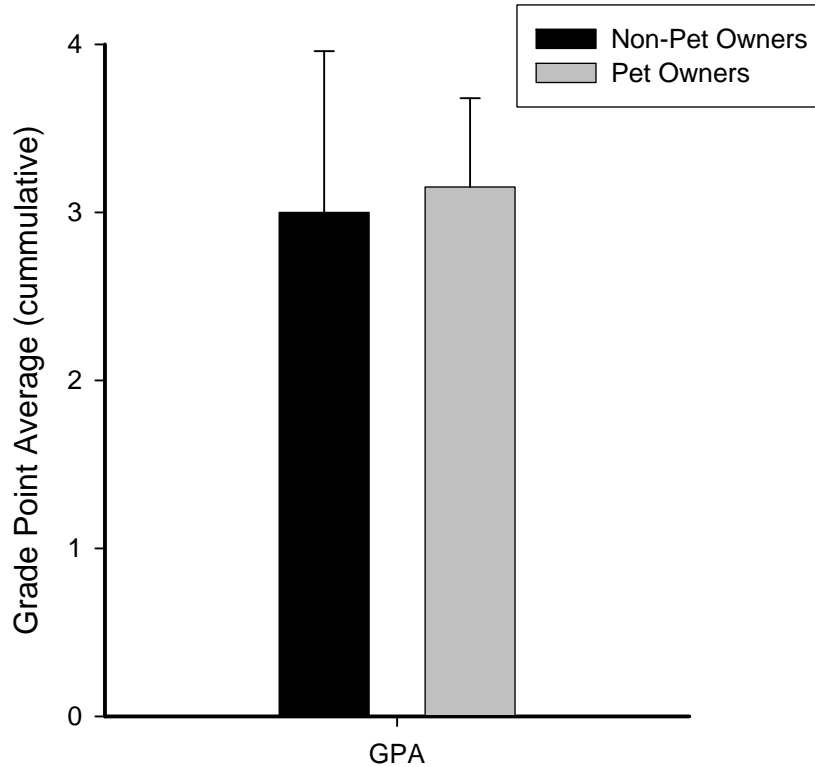
Hypothesis 3 – Students keeping a pet in their residence hall room will demonstrate higher Stephens College GPAs than those living in a residence hall without a pet. The range for GPA was from 0.648 to 3.938 on a four-point scale. Mean GPA for pet-owning students was slightly higher than for non-pet owning students, but the dependent samples  $t$ -test did not demonstrate statistically significant between group differences (Table 6, Figure 6). Hypothesis 3 was rejected. Students with pets did not demonstrate statistically significant higher GPA than those without pets.

Table 6

*Dependent Samples t-test for GPA (N = 50)*

	Non-Pet Owners	Pet Owners	T value (df = 24)	p
GPA	3.00 ± 0.956	3.16 ± 0.528	-0.672	0.508

Dependent Samples t-test for Grade Point Average



**Figure 6.** Values are means +/- standard deviations. There were no statistical differences ( $p \leq 0.05$ ) by dependent samples t-test.

Hypothesis 4 – Students keeping a pet in their residence hall room will demonstrate a greater tendency toward secure attachment style than those living in a residence hall without a pet. The distribution of attachment tendency for the entire sample, as well as by pet ownership status, was calculated (Table 6, Figure 7). A chi-square test for homogeneity was conducted and demonstrated that there was no

association between pet ownership status and attachment tendency,  $X^2 (3, N = 50) = 3.838, p = 0.279$ .

A breakdown of attachment tendency by pet ownership and year in college can be found in Table 8. Due to inadequate numbers in each cell, additional statistical analyses were not conducted. The pattern of attachment tendency is indicative that participants who have preoccupied and fearful attachment tendencies are less likely to persist in school than those with secure and dismissing attachment tendencies, regardless of pet ownership status.

The distribution of each attachment tendency was compared with the expected distribution (Bartholomew & Horowitz, 1991) using a chi-square goodness of fit test (Table 9). The results demonstrated that the distribution of attachment tendencies of pet owners was in the expected distribution. Conversely, the distribution of attachment tendencies of non-pet owners differed from the expected distribution. The presence of statistical significance indicates that the distribution of attachment tendencies differs from the expected distribution (Elliott & Woodward, 2007, p. 144). Thus, hypothesis 4 was accepted. Participants with a pet demonstrated attachment tendencies that more nearly reflected the general population than non-pet owning participants. Pet owners were primarily of the secure tendency (positive view of self and others), while non-pet owners were primarily of the dismissing tendency (positive view of self and negative view of others).

Table 7

*Distribution of Attachment Tendencies (N = 50)*

	Entire Sample	Non-Pet Owners	Pet Owners	Expected Distribution <sup>a</sup>
Secure	28.0% (14)	16.0% (4)	40.0% (10)	46.8%
Dismissing	40.0% (20)	44.0% (11)	36.0% (9)	18.2%
Preoccupied	20.0% (10)	24.0% (6)	16.0% (4)	14.3%
Fearful	12.0% (6)	16.0% (4)	8.0% (2)	20.8%

<sup>a</sup>Expected distribution based on Bartholomew & Horowitz, 1991  
Numbers in parentheses represent observed values.

Table 8

*Attachment Tendency by Pet Ownership Status and Year in College (N = 50)*

	Attachment Tendency			
	Secure	Dismissing	Preoccupied	Fearful
<b>Non-Pet Owners</b>				
Freshmen	1	4	4	1
Sophomore	2	3	1	2
Junior	0	2	1	1
Senior	1	2	0	0
<b>Total</b>	<b>4</b>	<b>11</b>	<b>6</b>	<b>4</b>
<b>Pet Owners</b>				
Freshmen	3	3	2	1
Sophomore	2	4	2	1
Junior	3	1	0	0
Senior	2	1	0	0
<b>Total</b>	<b>10</b>	<b>9</b>	<b>4</b>	<b>2</b>

Table 9

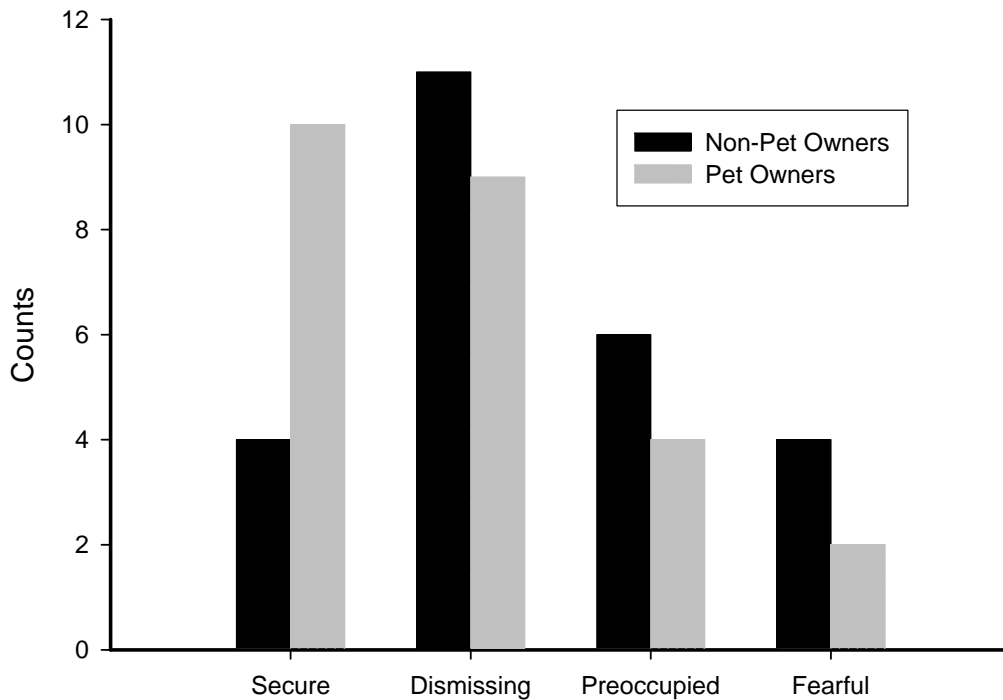
*Chi-square Goodness of Fit Comparing Attachment Tendency of Sample to Expected*

*Distribution (N = 50)*

	$X^2$	df	$p$
Entire Sample	20.171	3	0.001 <sup>a</sup>
Non-Pet Owners	16.333	3	0.001 <sup>a</sup>
Pet Owners	6.761	3	0.080

<sup>a</sup> Statistically significant difference in distribution from expected

### Attachment Tendency by Pet Ownership Status



**Figure 7.** Chi-square test for homogeneity of pet ownership by attachment tendency. There were no statistical ( $p \leq 0.05$ ) differences.

Hypothesis 5 – Students keeping a pet in their residence hall room will demonstrate stronger attachment to pets than those living in a residence hall without a



pet. Three assumptions must be met in order to conduct a dependent samples *t*-test. The assumptions are (a) normality, (b) homogeneity of variance, and (c) independence of observations (Stevens, 1999, p. 9). LAPS scores did not meet the assumption of equal variance (Levene's test). By transforming LAPS scores using square root methodology, the assumption of homogeneity of variance was met. A dependent samples *t*-test was conducted (Table 10, Figure 8). The dependent samples *t*-test demonstrated that the means LAPS scores differed by pet ownership status,  $t(24) = -5.64, p = 0.001$ . The transformed mean LAPS score for pet owners ( $9.0399 \pm 0.500$ ) was statistically significantly higher than the transformed mean LAPS score for non-pet owners ( $8.0318 \pm 0.823$ ).

Subsequently, a two-way analysis of variance (ANOVA) was conducted to determine if differences in LAPS scores differed by pet ownership status and year in college (Table 11). To allow for more equal group sizes on the two-way ANOVA, junior and senior participants were combined to form a group of upper class participants. Thus, there were three groups in the analysis, freshmen, sophomores, and upper classmen. No statistically significant effects for year in school were found, but differences in LAPS scores between pet ownership status were statistically significant.

The effect size was calculated by dividing the mean by the standard deviation (Cronk, 2008, p. 105). The effect size was 1.112, indicating a large effect size (J. Cohen, 1992). No interaction effects between year in college and pet ownership status were found. Hypothesis 5 was accepted. Students with pets did demonstrate stronger attachment to pets than those without pets.

Table 10

*Dependent Samples t-test for LAPS (N = 50)*

	Non-Pet Owners	Pet Owners	t value (df = 24)	p
LAPS (mean)	8.0318 ± 0.823	9.0399 ± 0.500	-5.564	0.001

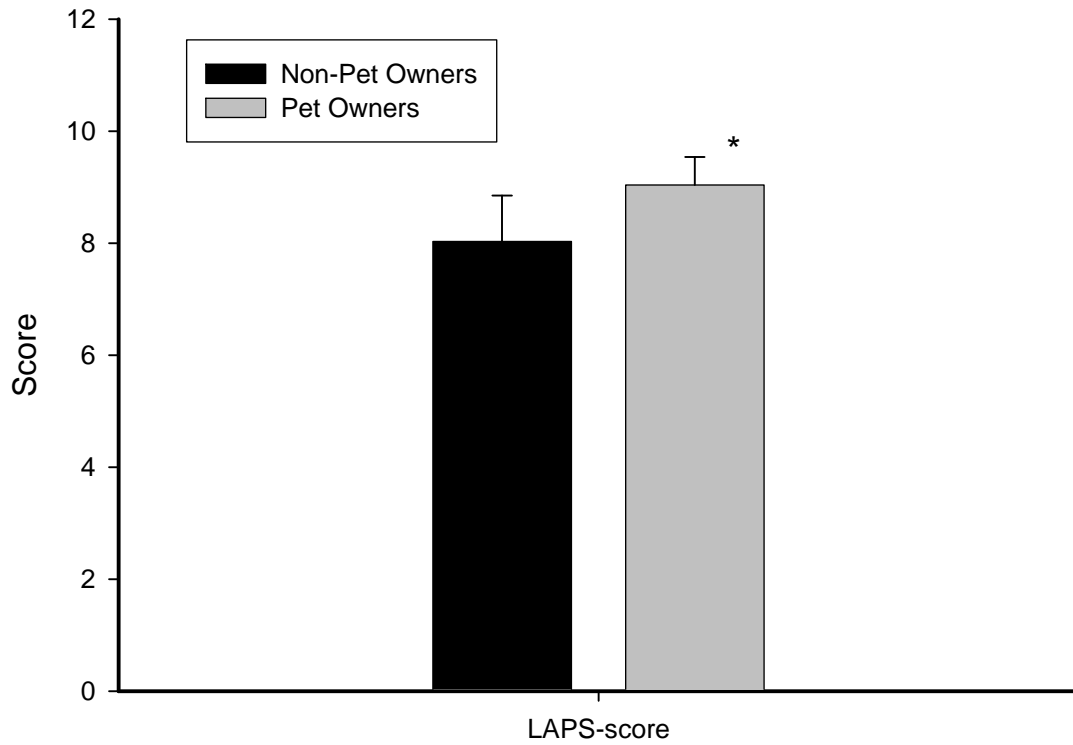
Table 11

*Two-Way ANOVA Pet Ownership and Year in College by LAPS score (N = 50)*

	Freshmen	Sophomore	Upper Classmen
Non-Pet Owners	65.80 <sup>a</sup> ± 11.97	62.88 <sup>b</sup> ± 16.68	65.43 <sup>c</sup> ± 8.08
Pet Owners	81.67 <sup>a</sup> ± 9.01	83.33 <sup>b</sup> ± 5.70	84.43 <sup>c</sup> ± 6.45

Legend Table 11: Values with the same superscripts are statistically significant (p < 0.05) via two-way ANOVA.

### Dependent Samples t-test for LAPS



**Figure 8.** Values (transformed LAPS scores via square root methodology) are means +/- standard deviations. Asterisk "\*" indicates that means were statistically different ( $p < 0.05$ ) via dependent samples t-test.

## Chapter V

### Discussion

This chapter has four sections. The sections include a brief summary of the study, discussion of the findings based on Tinto's model, limitations and strengths of the study, suggestions for further study, and implications for practice.

#### *Summary of Study*

The study design was a matched two-group comparison of college age students based on pet ownership status. Participants were matched by year in college and age. Following informed consent, participants completed the following instruments: SACQ, STAI, RQ, LAPS, and Demographic Questionnaire. Additionally, GPA for courses taken at Stephens College was obtained with the participants' consent. The results demonstrated that the two groups were similar on all but one item from the demographic questionnaire. No statistically significant differences were found between the two groups (non-pet owners and pet owners) on adjustment to college, anxiety, and grade point average. Statistically significant between-group differences were found on attachment to pets and attachment tendency. While no previous studies have addressed pet ownership and college student adjustment, a number of concepts from of the current study are related to past research.

#### *Discussion of Findings*

The findings will be discussed from the perspective of Tinto's Model of Institutional Departure (Figure 3). The demographic profile of the pet owning and non-pet owning participants was nearly identical, meaning that the pre-entry attributes that were assessed as part of this study were similar for both pet owners and non-pet owners.

In the current study, 86% of participants had owned a pet as a child, similar to other studies that reported the incidence of pet ownership in households with children between 70-92% (Parslow & Jorn, 2003; "Pet Industry Statistics and Trends," 2008). Similar to previous research (Kist & Johnson, 2008), the majority of participants (97.9% in this study) plan to own a pet in the future. This finding suggested that participants perceived pet ownership as being beneficial. The pet ownership factors that appeared to be associated with keeping a pet in a residence hall were age of responsibility for pet care and having multiple types of pets at one's permanent residence. Both may have created more opportunities for the individual to interact with pets and to become attached to pets. Therefore, these individuals with previous experiences of frequent pet interaction were being more likely to undertake pet keeping while attending college.

A limited number of studies have compared college student pet owners with non-pet owners. Previous studies did not focus on student adjustment to college and attachment tendency and did not use a research design that was comparable to the current study (Fidler et al., 1996; Zasloff & Kidd, 1994). While they demonstrated differences between pet owners and non-pet owners on a variety of parameters, Zasloff and Kidd's (1994) results were mixed, similar to the current study. Psychosocial concepts such as anxiety, attachment, adjustment to college, and loneliness were the focus in both the current study and the one by Zasloff and Kidd. Mixed findings also have been demonstrated from samples of adults on psychosocial characteristics such as anxiety and psychological well-being (Cole & Gawlinski, 2000; Lawton et al., 1984; Stallones et al., 1991; Straede & Gates, 1993). These findings suggest that the benefits of pet ownership

vary among pet owners and that further study is indicated to more fully understand pet owners and benefits of pet ownership.

Anxiety was one of the pre-entry attributes according to Tinto's model. No statistically significant differences were found between pet owners and non-pet owners, but trait anxiety scores approached statistical significance, indicating a trend for pet owners to have lower trait anxiety. Trait anxiety scores reflect the usual degree of anxiety one experiences (Spielberger et al., 1983). Previous studies have yielded inconsistent findings on the influence of pet ownership and/or pet interaction on anxiety in college students. Anxiety was a dependent variable in an experimental study in which the presence of a dog was associated with a lower state anxiety more than either reading quietly or aloud (C. C. Wilson, 1991). In contrast, no differences in state anxiety were noted whether or not a dog was present during a stressful activity (preparation of a speech) (Straatman et al., 1997). The current two-group comparison study was similar to other two group comparisons of community-dwelling adults which did not find statistically significant differences in anxiety between pet owners and non-pet owners (Friedmann & Thomas, 1995; Straede & Gates, 1993). Overall, these findings suggest that pet ownership may be associated with a lower trait anxiety, while pet interaction may induce a lower state anxiety, which is transient in nature. Further research on the influence of pet ownership and anxiety is indicated.

According to Tinto's model, a wide variety of institutional experiences influence a student's integration to the college experience. Related to academic factors, academic majors of the two groups were quite similar to each other, reflecting most areas of study offered at Stephen's College. Keeping a pet in a residence hall and being attached to the

pet is one of many formal and informal institutional experiences that interact to determine whether or not a student persists in college.

The findings that pet owning participants had statistically significantly higher LAPS scores than non-pet owning participants corresponds with the previous findings that more strongly attached pet owners provided higher levels of pet care (Kurdek, 2008; Shore et al., 2005). Being a pet owning college student puts full responsibility for pet care on the student. Students with pets live in single rooms, so any assistance with pet care must be provided by a fellow student living in a different room. Even if the young person has primary responsibility for pet care at home, there are others within the household that can easily assist with pet care as needed. The level of responsibility would be greater for college students than most young people keeping pets in the family home. They are responsible for routine care of feeding and exercising. In addition, pet owning students must be alert to developing health and behavior problems. During data collection at the residence hall activity, one dog had an 'accident'. The owner was very concerned about this as she reported that accidents were very rare for her dog. The next day, she reported that she had taken her dog to the veterinarian as the condition had worsened over time, demonstrating a high degree of responsibility and accountability. Had this incident occurred at home, most likely a parent would have taken the dog to the veterinarian.

The current findings contrast with other studies that demonstrated that those who were more strongly attached to their pet tended to be less social (Fritz, Farver, Hart, & Kass, 1996; Stallones et al., 1991). Social and personal adjustment to college as

measured in the SACQ subscales was found to be nearly equal in both groups, indicating that social interactions were similar between pet owners and non-pet owners.

In the current study, nearly equal numbers of participants had owned pets as child, yet those keeping pets in the residence hall demonstrated a greater attachment to their pet. The neurochemical mechanisms associated with human-animal interaction have been demonstrated (Odendaal, 2000), but how and when pet attachment initially occurs is not clearly known (Staats et al., 1999). As had been demonstrated in previous studies, pet ownership does not equal pet attachment (Ory & Goldberg, 1983; Poresky, Hendrix, Mosier, & Samuelson, 1987). Primary caregivers have been found to be more attached than those who simply considered themselves to be pet owners (Marks et al., 1994). Individuals keeping a pet in a residence hall are the primary caregiver and greater attachment would be expected as was demonstrated in the current study. Therefore it would seem logical that those keeping pets in the residence hall would represent those who were more attached to their pets than those keeping pets at their permanent residence.

Faculty-staff and peer-group interactions would be influenced by one's attachment tendency, according to attachment theory. The patterns of attachment tendencies in the present sample were statistically different between non-pet owners and pet owners. Attachment tendencies of pet owners have not been characterized except when Beck and Madresh (2008) adapted the Relationship Questionnaire (RQ) to assess relationship with pets and romantic partners in a sample of pet owners. The secure tendency was the most common of the four attachment tendencies in their sample of pet owners, consistent with the current study. These findings also correspond with Colby



and Sherman's (2002) findings that nursing home residents with secure attachment responded more positively to a pet intervention than those with an insecure attachment tendency. The attachment tendency of non-pet owners has not been characterized in other studies. One would expect that individuals with a secure view of self and others could easily become attached to a pet and be likely to keep a pet in the residence hall. The pet could serve as an inanimate transitional object that during this time of transition to adulthood (Triebenbacher, 1998). In contrast, those who have a negative view of others (dismissing and fearful tendencies) would be less likely to become attached to a pet. In the current study, the most common attachment tendency for non-pet owners was dismissing (positive view of self and negative view of others). The dismissing attachment tendency could partially explain why non-pet owners had statistically lower LAPS scores and did not desire to keep a pet in a residence hall as compared with pet owning participants. Further research in the area of attachment tendencies in pet owners is indicated.

In the current study, there was a trend that those with a secure attachment tendency were more likely to persist in college. No college seniors indicated a preference toward preoccupied and fearful attachment tendencies. The current cross-sectional sample did not have adequate numbers in each cell to statistically compare attachment tendencies by year in college, a problem noted in other attachment studies (Bernier et al., 2004). Previous studies demonstrated that a secure attachment tendency was associated with better adjustment to college and persistence in college than the insecure attachment tendencies (Bernier, Larose, Boivin, & Soucy, 2004; Lopez, 1996; Perrine, 1998, 2001; Rice, FitzGerald, Whaley, & Gibbs, 1995). Based on the patterns of attachment tendency

and previous research, one would expect measures of adjustment to college (SACQ and GPA) to differ by pet ownership status. SACQ scores and GPA were higher in pet owning students than those without pets, but the differences were not statistically significant.

Scores on the SACQ total and subscales and GPA identified the degree of personal/normative integration, according to Tinto's model. An interesting finding was that the entire sample fell below the 50<sup>th</sup> percentile on most adjustment measures, indicating a need for further study in this area. Pet owners differed from non-pet owners as predicted on integration measures, but the differences were not statistically significant. The lack of significant findings related to personal/normative integration are most likely related to the fact that Tinto (1987) identified that there are a multitude of factors that influence whether or not a student persists in college. Along similar lines, there are multiple paths by which human interactions with pets lead to beneficial effects (Staats et al., 1999). Among the factors were attachment to the pet, pet care, human self-care, personal health, commitment to the pet and its care. Most likely pet ownership was but one small part of the total process of adjustment to college. With two very complex variables, it is difficult to clearly assess how one impacts the other.

Anecdotal reports by students during data collection indicated their positive views of pet ownership. One of the pet owning participants reported, "I did O.K. my first semester without my cat. Once I had my cat in the dorm, things were so much better." This student might have persisted with college, but having her cat with her has improved her perception of her college experience. Similar sentiments were echoed by other pet owning participants. Additionally, non-pet owners reported that they missed seeing the

pet they had left at home and wished they could have their pet on campus. Non-pet owners reported reasons for not having their pet on campus as their permanent residence was too far to travel with a pet and the age of their pet. No data for comparison of retention and graduation rates between pet owners and non-pet owners were available.

### *Limitations and Strengths*

Several limitations to this study were noted. The convenience sample of 25 matched pairs may have represented the population of pet owners, but limited statistical analysis based on year in college and attachment tendency. This sample represented approximately 50% of the pet owners at Stephens College. The Director of Residence Life reported that there were approximately 50 pet owners (L. Arnold, personal communication, February 4, 2009). Ms. Arnold reported that the number of pets varied because students take their pets home for various reasons, such as illness (personal or pet), and may or may not bring the pet back to the residence hall. Even if all pet owning students were able to participate, a sample size of 50 would not have been adequate to demonstrate adequate power at the level desired for the study.

The small sample size limited the statistical ability to demonstrate group differences. Matching procedures allowed for better control of extraneous variables in such a small sample. However, the use of matching limits the generalizability of the findings to those participants with the same characteristics as the matched sample (Kerlinger & Lee, 2000). A lack of significant differences between pet owning students and non-pet owning students could be attributed to low power (J. Cohen, 1992). However, no other studies have been conducted to assess the effect of a student keeping a

pet in a residence hall. Therefore, the findings of this study should serve as the basis for beneficial questions to be posed by future studies of this topic.

The sample of this study was homogeneous. The process of matching created an even more homogeneous sample. The sample may have been homogeneous on so many characteristics that differences between groups could not be detected without an extremely large number of participants. The small standard deviation on most measures contributed to larger effect sizes (difference between means/standard deviation) than anticipated (Cronk, 2008). The calculated effect sizes were as follows: SACQ = 0.266, State Anxiety = 0.017, Trait Anxiety = 0.365, GPA = 0.134, and LAPS = 1.112. Only the LAPS scores demonstrated statistically significant differences via dependent samples *t*-test, yet the effect size was small-moderate for Trait Anxiety which did not achieve statistical significance. In spite of the small sample size, trends were present demonstrating that differences between pet owners and non-pet owners may exist.

The use of a cross sectional design did not allow for a more thorough testing of Tinto's Model of Student Departure. Whether or not participants were able to achieve their goals and commitments as a college student was not included with this design. An interesting note is that college administration has not tracked retention data based on whether or not students keep a pet in a residence hall. The battery of questionnaires did not include open-ended questions related to the experience of being a pet owning college age student. The addition of open ended questions could be used to further explore reasons for keeping a pet on campus.

The use of the RQ was convenient and quick to administer, but has been criticized by some as being too narrow for a concept as complex as attachment (Crowell, Fraley, &

Shaver, 1999). By using a short questionnaire to assess attachment tendency, the participant burden was limited. This was of particular concern in the current study as completion of the instruments required 20-30 minutes, depending on the participant. The use of a categorical measure limits the complexity of statistical tests, such as logistic regression, that can be carried out (Elliott & Woodward, 2007).

Several strengths can be noted in the current study. The use of matched groups helped to control for the extraneous variables of age and year in college. The instruments used in the study have been widely used with strong reliability and validity. This is the first study that evaluated effect of keeping a pet in a residence hall on college student adjustment to college; therefore the use of established instruments helps to validate the findings.

The use of a naturalistic setting for collecting most data in the commons area near the dining hall provided informal surroundings to recruit participants and collect data. This setting set the tone for participants to complete the instruments in an unhurried manner. Tinto's Model of Student Departure provided a framework to conduct the study. While not testing the entire model, the model provided a good fit to explain the many aspects related to persistence in college.

In addition to further research already mentioned, future studies should involve the use of multiple sites to create a larger sample and increase the likelihood of demonstrating between group differences. Additionally, longitudinal studies that compare pet owners with non-pet owners in regard to graduation rates could possibly demonstrate the long term effects of pet ownership during college and further test Tinto's model.

### *Implications*

The current study demonstrated that keeping a pet in a residence hall can be beneficial to some students and is not detrimental in terms of GPA and adjustment to college. Allowing pets in residence halls was one of many options available to students. These options were designed to appeal to college students and promote retention in college. Several participants indicated that having a pet in the residence hall was one of several factors influencing their decision to attend Stephens College. Residence hall situations on other campuses may not lend themselves to pet keeping as well as Stephens College. By having several small residence halls, administrators can designate a hall specifically for pets and their owners.

The current study compared two matched groups of pet owning and non-pet owning college students on a variety of measures. The pet owners were found to be more attached to their pet than those who did not have a pet in the residence hall. Additionally, pet owners demonstrated patterns of attachment tendencies more consistent with the general population than non-pet owners. This study can serve as the basis for further studies of the effects of keeping a pet in residence halls on college student adjustment.

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Appendix A

Human-Animal Bond Research Studies

Author/Year	Research Design	Sample	Variables	Methods/Findings
Allen, K., Blascovich, J., & Mendes, W. B. (2002).	Two group comparison	N = 240 married couples, half were pet owners and other half non-owners	IV- presence of friends, spouses, & pets; DV – cardiovascular reactivity to psychological & physical stress	Baseline questionnaires included Pet Attitude Questionnaire, Relationship Closeness Inventory, Cook-Medley Hostility Scale, Interpersonal Support Evaluation List, Multidimensional Anger Inventory and demographic information. Also monitored BP & HR every minute. Subjects were exposed to mental arithmetic test and cold pressure (stressors). Extensive analysis included self report measure, cardiovascular response and recovery times for both conditions and compared pet owners with non-owners. Pet owners had lower HR & BP at baseline, lower reactivity, and most rapid recovery in the pet present conditions.
Allen, K., Shykoff, B. E., & Izzo, J. L. (2001).	Experimental	N = 48 adults with Stage II hypertension 24 men and 24 women	IV = Lisinopril therapy and pet ownership; DV = systolic BP, diastolic BP, plasma rennin, stress, & coping	Baseline assessment of HR, BP, renin, stress & coping before and after mental arithmetic task and speech (stressors). All started drug therapy for hypertension. Experimental group instructed to get a dog or cat. Followed at one and six months with exposure to stressors. All had decreased BP, but pet owners had significantly less physiological response to a stressor. Concluded that pet ownership reduced BP response to mental stress.
Anderson, W. P., Reid, C. M., & Jennings, G. L. (1992).	Correlational	N = 5741 at free screening, age 20-60. 784 pet owners and 4957 non owners.	Pet ownership, risk factors for CV disease, BP, cholesterol, triglycerides, height & weight (converted to	Assessed subjects at a free screening clinic. Demographics between pet owners and non-owners were essentially the same. Owners exercised more, ate more meat, and ate more take out. Pet owners had lower systolic BP and lower triglycerides. Other differences based on age were not significant.

Barker, S. B., & Barker, R. T. (1988).	Descriptive/ correlational	Convenience sample Total N = 122, 29 dog enthusiasts, 40 typical dog owners, 26 graduate student pet owners, 27 elementary children	BMI) IV = type of pet owner and relationship type (from diagram); DV = distance in drawing	Used Family Life Space Diagram. Subjects indicated themselves within a circle (family) and then added family members and dog in the circle. Measurements were made of person closest to subject, average of family members, and dog. Children had longer distance to dog than either pet owners or pet enthusiasts. The self-canine mean was significantly less than the family mean. Differences in self-canine and self-closest member were not significant. 38% placed the dog the closest of all. Demographic variables such as family size, years of dog ownership, etc. were not strongly associated with shorter distances to pet.
Baun, M. M., Bergstrom, N., Langston, N. F., & Thoma, L. (1984).	One group with three interventions	N = 24, age 24-74 without hypertension	IV = quiet reading, petting strange dog, petting own dog DV = BP, HR, & respiratory rate	Baseline measurement and nine minute measurement sessions x3 for each condition were made. Greatest decrease in BP over time was with own dog. Quiet reading demonstrated lowest values of three conditions. When own dog entered room a “greeting response” was noted, values increased. Self-reported attachment on 1-5 scale. All rated attachment as either a four or a five (extremely attached).
Beck, L., & Madresh, E. A. (2008)	One group comparison	N = 192 pet owners	Relationship with pets compared with relationship with humans	Used Relationship Questionnaire and Experiences in Close Relationships-Revised adapted for pets and humans. Study conducted online. Relationships with pets were found to be more secure than relationship with other humans, serving as consistent source of attachment security. Ratings of pet relationships did not correlate well with ratings of human relationships.
Berryman, J. C., Howells, K., & Lloyd-Evans, M. (1985).	Descriptive	N = 30 ages 17-61 + 10 year old visiting a	Pet owners view their pet relationship and how the pet	Used repertory grid technique. Subjects were given eight cards and wrote 1) same sex parent, 2) spouse or s/o, 3) same sex friend, 4) child under 10, 5) own child under 10, 6) disliked person, 7) current pet, 8) previous pet.

			university	relationship compares with human relationship.	Sets of three cards (at least one pet card) were put together and subjects specified how the relationship with two were the same and different from the third. Used grid analysis technique. Results demonstrated that pets were more like own child than other elements. Three major constructs were identified, pets were dependent & needed care; pets were a source of fun; pet were relaxing and had no complex expectations. Identified that subjects could easily apply human traits to pets. Range of importance of pets was wide.
Cohen, S. P. (2002).	Exploratory, descriptive	Phase I N = 201 randomly selected pet owners from vet hospital; Phase II N = 16 randomly selected from Phase I	Compare relationship between family member and pet; compare pet and child relationships; notion that those close to pets do not like people; strength of bond between pet & owner	Two phase study of pet owners. Phase I participants responded to surveys. Phase I tools: Revised Kinship Scale (humans & pets), Intimacy Scale (people & pets), Loneliness Scale, Social Fear Scale, Index of Parental Attitude (child & pet), Companion Animal Bonding Scale. Looked at relationship to closest person and to animal. Men and college graduates were most likely to have less strong feelings about relationships. Phase II: interviewed 16 from Phase I. Some would save dog first if boat capsized. Also would give pet scarce drug, not another human.	
Colby, P. M., & Sherman, A. (2002).	Field study – pre-test, post-test on mood	N = 52 assisted living residents	IV=dog visitation; DV=mood	Baseline measures of attachment style questionnaire and mood questionnaire (Mood report). All were administered verbally. Relationship questionnaire was revised to be of similar format to other tool and not too long. Also used Langley Porter Physical self-maintenance scale (completed by nurse familiar with participant). Participants chose size of dog and interacted for approximately 10 minutes with handler to side. Post test assessment was of mood. Findings: No correlation found between physical assessment and attachment and	

				<p>mood measures. Fourteen chose not to visit with dogs. Those high on anxious ambivalent style were less likely to visit with dog. Attachment style did not impact how interaction occurred; all very similar. After interaction feelings of depression increased for those with a fearful avoidant style and decreased with higher scores on anxious ambivalent. “Strongest prediction of moods were mood at time 1.”</p>
Cole, K. M., & Gawlinski. (2000).	Pre-test Post-test pilot study. One group design serving as own controls	N = 10 hospitalized patients awaiting heart transplant	IV = fish aquarium; DV = stress, anxiety, depression, and hostility	<p>Fish aquarium intervention. Assessed pre-intervention and at 3 and 11 days after installation of aquarium. Used Multiple Affect Adjective Checklist-Revised. No significant changes noted. Lack of significant findings attributed to small sample size. Also discussed dog visitation program. Positive responses from both patients and staff perspectives.</p>
Dembicki, D., & Anderson, J. (1996)	Cross-sectional observational	N = 127 senior citizens, 44 pet owners & 83 non-pet owners	Initially IV = pet ownership/attachment & demographics; DV = eating & exercise habits, then the DV became IV and DV = nutritional status and risk factors for CV disease (to fit model)	<p>Discussed benefits of animals in terms of “becoming their time clock” to get up, eat, etc. Tested 10 hypotheses. Surveyed seniors from nutrition centers. Objectives were to assess for dietary and exercise differences between pet owners and non-owners, dietary and CV risk factors between groups, and interaction of dietary, CV risk factors, and exercise. Tools included pet ownership questionnaire, 24 hour dietary intake, exercise levels, demographics, self reported height, weight, and BP, calculated BMI &amp; waist to hip ratio, lipid profile, health, illness, and emotional distress questionnaires. None of the hypotheses were supported fully but did have three significant findings 1) dog owners walked more minutes than non-owners, 2) pet owners had lower triglycerides, and 3) negative correlation between time walking and triglycerides.</p>
Edwards, N. E.,	Time-series	N = 62	IV = aquarium	<p>Dogs and cats are not considered to be safe around</p>

<p>&amp; Beck, A. M. (2002).</p>	<p>design with non-equivalent control group. Three group comparison</p>	<p>residents of special care units, three different facilities</p>	<p>observation by residents at mealtime; DV = nutritional intake</p>	<p>dementia patients due to unpredictable patient behaviors. Therefore, aquarium was chosen. Baseline nutritional intake assessed; aquarium placed for intervention, ocean picture used in control facility; intake measured daily for two weeks and weekly for six weeks. Control group also became treatment group. Results: residents ate significantly more and decreased use of supplements; most gained weight. Theoretically, aquarium calmed the restless and made the lethargic more alert.</p>
<p>Fidler, M., Light, P., &amp; Costall, A. (1996).</p>	<p>Two group comparison</p>	<p>N = 40 undergraduate psychology majors; 20 with pets and 20 without</p>	<p>Description of dogs following brief video clips</p>	<p>Hypothesized that those who had had a pet would describe dogs mentalistically more than nonowners. Participants viewed five video clips of dogs interacting with owners in natural settings. After each were asked “What do you think is going on, focusing particularly on the dog?” Responses were categorized as desire, feelings, understanding, or other. Owners and non-owners all responded in each category, but the overall frequency was more frequent with pet owners in general, but not by category. Also significant effect for category with desire being most frequent. Differences between episodes for owners and non-owners was not noted.</p>
<p>Folse, E. B., Minder, C. C., Aycock, M. J., Santana, R. T. (1994)</p>	<p>Quasi-experimental</p>	<p>N = 44 depressed college students</p>	<p>IV = AAT and psychotherapy DV = Beck Depression Inventory Scores (BDI)</p>	<p>Participants were at least mildly depressed by BDI scores. Assigned randomly to one to two treatment groups. Control group (N = 27) consisted of those who could not meet at designated times. Treatment groups were randomly assigned. Treatment consisted of either directive group therapy with two year-old dog present or unstructured group with seven-month-old dog present. Statistically significant differences were between the AAT only and the control group.</p>
<p>Friedmann, E., Katcher, A. H.,</p>	<p>One group comparison</p>	<p>N = 38 Children age</p>	<p>IV = presence of dog; DV = BP</p>	<p>Evaluated BP of children while reading aloud in the presence of a dog (unfamiliar) and without. Randomly</p>

Thomas, S. A., Lynch, J. L., & Messent, P. R. (1983).		9-16		introduced dog first or read alone first. BP did lower with dog present. Effect was more pronounced if dog was introduced first. Discussion identified that dog presence could have relaxed the researcher and then the child.
Friedman, E. & Thomas, S. A. (1995)	Descriptive/correlational	N = 424 with 369 at end of 1 year. All post-MI in CAST study. Mean age 62.83	IV = pet ownership & social support; DV = 1 year survival	Randomly selected subjects from CAST study. Baseline assessment included: Social Support Questionnaire-6 (SSQ-6), Social readjustment scale, pet ownership/attachment survey, state-trait anxiety inventory, self-rating depression scale, Jenkins Activity Survey, & expression of anger scale. Physiological measures collected were: left ventricular ejection fraction, presence of myocardial ischemia, CHF, NY and Canadian Cardiovascular classification, number of previous MIs, presence of diabetes, family history (from CAST data base). Mortality data was obtained from program staff, family, & medical records. Findings: dog owners had better survival rates than cat owners. Physiological parameters were predictive of survival but were nearly equal initially. Overall, dog ownership & social support were independent predictors.
Friedmann, E., Thomas, S. A., Cook, L. K., Tsai, C., & Picot, S. J. (2007)	Experimental	N = 11 older adults with pre- to mild hypertension. Four were pet owners	IV = presence of unfamiliar, friendly dog; DV = BP	Baseline measures were BP and Mini-Mental State Examination. Used quiet-talk-quiet protocol for two minutes each as stressor. Protocol carried out twice, one with dog present and one without. Randomly assigned dog to be in the room first. Participants did not interact with the dog during the experiment. BP was on the average 7/2 mmHg lower while talking with dog present than without the dog. Presence of dog did not alter BP during quiet times.
Fritz, C. L., Parver, T. B.,	Descriptive correlation	N = 244 caregivers to	Effect of association with	Surveyed caregivers of those with Alzheimer's disease. Data collection included demographics, social activity,

<p>Hart, L. A., &amp; Kass, P. H. (1996).</p>		<p>persons with Alzheimers</p>	<p>pet by caregivers on psychological health, also considered variables of age, sex, species.</p>	<p>Lexington Attachment to Pets Scale (LAPS), Memory &amp; Behavior Problems Checklist (assess severity of disease), Alzheimer's Caregiver Burden Interview, Life Satisfaction Index-Z, Geriatric Depression Scale. No significant differences on psychological indices were found between pet owners and non-owners. Young women with pets had lower Caregiver Burden scores than young non-owning women. Middle aged women with pets had lower Life Satisfaction scores and higher Depression scores. Younger women attached to cats had lower Burden scores than non-owners. Middle aged women attached to dogs had lower Life Satisfaction and higher Depression scores (consistent with middle aged overall). About 14% of all were "very attached" to pets. Non-uniformity of responses was consistent with other studies. Men were more consistent than women.</p>
<p>Grossberg, J. M., Alf, E. F., Vormbrock, J. K. (1988)</p>	<p>Two group comparison</p>	<p>N = 32 male, dog owning, college students</p>	<p>IV = arithmetic problems and thematic apperception cards; DV = BP, HR</p>	<p>Baseline measures of BP, HR, Jenkins Activity Scale, and Pet Attitude Scale. Half of participants had own dog in room during stressors. A cardiovascular response to the stressor was noted but differences between dog and no dog owners were not significant.</p>
<p>Headey, B. (1999)</p>	<p>Descriptive</p>	<p>N = 1011 Australians over 16 years old. 540 owned dog or cat. Stratified probability sample.</p>	<p>Test relationship between health &amp; pet ownership; determine implications (cost savings) to national healthcare.</p>	<p>Surveyed households randomly. For pet owning households, attempted to talk to main caregiver of animals. Used questions about impact of pets on community as well as health of participants (doctor visits and medications), and exercise level. Those owning other than dogs or cats did not seem to benefit healthwise and were included with non-owners. Pet owners made fewer doctor visits (only significant at 0.10). Percentage of pet owners on medications was significantly fewer than non-owners. Pet owners over 54 (men &amp; women)</p>

					took statistically fewer medications. Young women, older women, and older men seemed to benefit most from pets. Pet owners reported feeling less lonely, but significance was not reported, therefore may not have been significant. Non-partnered people seemed to benefit from pets. Extrapolated health cost savings by pet owners as \$1.8 billion.
Herzog, H. A. (2007)	Review of effect size	N = 31 articles on attitudes; N = 12 articles on attachment; N = 11 articles on activism	Review for effects size of gender differences found in HAI studies.		Pet attitudes – medium effect size of women more sympathetic towards animals. Pet attachment – small effect size with women more attached. Animal activism – women more active with activism.
Johnson, R. A., Meadows, R. L., Haubner, J. S., Sevedge, K. (2003)	Quasi-experimental, three group comparison, pilot study	N = 30 cancer patients, age 27-75.	IV = assigned to one of three treatments, visit from dog, visit from human visitor, quiet reading; DV = Participant's perception of the visit		Randomly assigned to one of three treatment groups. Intervention lasted 15 minutes. Measures included questionnaire to assess benefit of intervention and demographic questionnaire. Individuals receiving dog visits and a friendly visitor rated the experience statistically more favorably than did the quiet reading group. There were no statistical differences between the two types of visitors; the frequency of positive responses to individual questions was greater in those who received a dog visit than those who had a human visitor
Kaiser, L., Spence, L. J., McGavin, L., Struble, L., & Keilman, L. (2002).	Descriptive two group comparison	N = 10 nursing home residents, but five completed protocol.	IV = visit from happy person or dog; DV = prosocial behaviors		Compared the effect of a happy visitor and dog visitor with five nursing home residents. Established categories of interactions for resident and intervention (dog & visitor), including nonverbal behaviors, those initiated by resident & visitors. Used bar code wand to tally significant interactions. Generally more interactions with dog of patting etc. Five participants were asked about preference for type of visitor. No consistent responses and responses were not consistent with the amount of



Kogan, L. R., & Viney, W. (1998).	Correlation	N = 188 college students	Investigated the relationship between human-animal bonding and whether or not the individual chose their own pet.	interaction. Gist is that any interaction is beneficial. Completed Companion Animal Bonding Scale, demographic questions, who chose the dog, and how long they wanted a dog before acquiring. There were statistically significant differences in bonding with those who were involved in selecting their pet and those who were not. Those involved in dog selection had stronger bonding to the pet. Presents this as an extension of attachment theory.
Kurdek, L. A. (2008).	Descriptive	N = 923 college students (four samples)	Extent to which pet dogs fit with characteristics of human attachment.	Based on slightly different aspect of attachment theory than used in proposal. Responded to how well their dog fit with four features of attachment (secure base, separation distress, safe haven, and proximity maintenance), measures of closeness, extent of care for dog, human personality factors, attachment style, personality of dog, and how well their dog met their need for autonomy, competence, and relatedness. Not all samples completed all measures. Findings demonstrated that dogs were important to college students and those who were highly attached to their dog felt their relationship was nearly equivalent to that of human relationships.
Lawton, M. P., Moss, M., & Moles, E. (1984)	Analysis of secondary survey	N = 3,996 people over 65	Looking for attributes associated with pet ownership and correlation to well-being.	Secondary analysis of 14 year old data. Only about 24% of sample owned pets. Some significant differences were found, mostly environmental (housing, urban vs. rural, etc.) No correlation between pet ownership and psychological well being was noted.
Marks, S. G., Koepke, J. E., Bradley, C. L. (1994).	Descriptive; correlational	N = 179 undergraduate psychology students. 91	Concepts of pet attachment & generativity	Presents idea that pet attachment & generativity are related due to the concepts that nurturance is involved in both. Hypothesis: pet attachment & generativity are positively related. Second aim to replicate findings

		completed surveys of pet owners		regarding pet attachment (females would score higher) & generativity (females would score higher and age would be positively correlated). Instruments: Pet Attachment Survey (PAS) and Loyola Generativity Scale (LGS). Found significant positive correlation between PAS and LGS. Women were slightly, but not significantly, higher on both scores. Primary pet caregivers were significantly higher than nonprimary caregivers. Pet owners and former pet owners combined to be 92% of sample and most wanted them in the future.
Miller, S. C., Kennedy, C., DeVoe, D., Hickey, M., Nelson, T., & Kogan, L. (2009)	Experimental cross-over design	N = 10 men and 10 women	IV = dog interaction and quiet reading; DV = oxytocin	Drew baseline oxytocin levels, followed by either interacting with dog or quiet reading. Drew oxytocin levels after intervention. Oxytocin levels increased in females after dog interaction, while it decreased in females after reading and men under both conditions.
Motooka, M., Koike, H., Yokoyama, T., & Kennedy, N. L. (2006).	Controlled crossover study	N = 13 healthy senior citizens	IV = walking with and without dog; DV = heart rate variability	Monitored HR variability to assess for parasympathetic activity (HF power). HF power described to help buffer stress. Participants walked 30 minutes with dog and without. Three participants did this for three days, while others did just once. Four subjects were monitored for 6 hours in their home with two 30 minute sessions with a dog. HF power increased significantly while walking with the dog and was more pronounced during home interactions.
Nimer, J., & Lundahl, B. (2007)	Meta analysis	N = 49 studies that met inclusion criteria	Effectiveness of Animal Assisted Therapy (AAT)	Inclusion criteria for analysis a) specific to AAT, b) minimum of five in treatment group, c) English language, d) adequate information in article to compute effect size. Studies with participants of all ages were included. Moderate effect size noted with those with autism symptoms, medical difficulties, behavioral problems, and

Odenhaal, J. S. J. (2000).	Experimental	N = 18 humans and 18 dogs	IV = healthy humans and dogs interacting positively; DV = BP, B-endorphins, oxytocin, prolactin, B-phenylethylamine, dopamine, & cortisol.	emotional difficulties. Extensive theoretical background included. Explains <i>attentionis egens</i> as need for attention on a basic emotional level as the prerequisite for successful social interaction. Hypothesis: neurochemical responses would reflect positive human-dog interactions. B-endorphin, oxytocin, prolactin, b-phenylethylamine, and dopamine increased significantly in humans and dogs. A decrease in BP was used as the indicator that relaxation had occurred and served as a cue for blood to be drawn. In both humans and dogs, B-endorphin, oxytocin, prolactin, B-phenylethylamine, and dopamine increased significantly, while cortisol decreased significantly in humans. Oxytocin increased more in subjects interacting with their own dog. In comparing interaction with a dog and quiet reading, there were significantly greater increases in oxytocin, prolactin, and B-endorphin following dog interaction, demonstrating the therapeutic effect of pet interaction. The duration of the intervention was relatively short (5-24 minutes). Odenhaal proposed that brief, frequent interactions with a companion animal would be most beneficial.
Ory, M. G., & Goldberg, E. L. (1983).	Descriptive	N = 1073 older women	Happiness & pet attachment	Interviewed 1,073 older married women in semirural county of Maryland. Found no relationship between pet ownership and happiness. But when the data separated those who considered themselves attached versus not attached, the non attached pet owners were considerably less happy and did not perceive husband as confidant.
Parslow, R. A., & Jorm, A. F. (2003).	Descriptive community survey	N = 2528 age 40-44; N = 2551 age 60-64 Australians	Associations between pet ownership and cardiovascular risk	Part of PATH Through Life Project (longitudinal study of randomly selected Australians. Survey assessed for pet ownership, education, physical health measures (ht, wt, presence of diabetes, smoking, exercise level). Took

<p>Raina, P., Waltner-Toews, D., Bonnett, B., Woodward, C., &amp; Abernathy, T. (1999).</p>	<p>Longitudinal (1 year) descriptive</p>	<p>N = 1054 baseline; N = 995 at one year. Over 65 living in one county in Ontario</p>	<p>Objective: relationship between pet ownership and physical and psychological well-being; if presence of pet modified relationship between physical and psychological health, and social networks.</p>	<p>two BPs and averaged values. 57% owned pets. Pet owners had less education, higher diastolic BP, higher BMI, and more likely to smoke. Controlling for health risks, pet owners had significantly higher diastolic BP but not systolic. Telephone survey of older adults (part of government run health care). Assessed social activity network, chronic health conditions, pet ownership &amp; attachment, physical health (ADLs), psychological health, and demographics. No reliabilities reported. Over the year of the study, 13% of pet owners lost their dog, but were not different than pet owners at end of the year. None got a new pet. Female owners were more attached than men and attachment was higher with dog owners than cats. Of non-pet owners, 19% stated their residence would not permit pets. Pet owners were more likely to be younger, married or living with someone, and more physically active. All reported decline in ADLs, but greatest in women 65-69 and women over 80. Psychological changes were not significant between pet owners and non-pet owners. Pet owners had higher physical functioning than non owners, but not psychological. More physical deterioration was noted in non-pet owners. No differences were noted with cat and dog owners. Presence or absence of pet did not modify physical or psychological health or social support.</p>
<p>Roenke, L., &amp; Mulligan, S. (1998).</p>	<p>Qualitative, not based on particular research tradition</p>	<p>N = 4 females in nursing home and 1 pet therapy volunteer</p>	<p>Goal was to explore “characteristics of pet therapy which promote positive experiences for the</p>	<p>Interviewed three of the four residents together and other one separately. One interviewed alone was reported to not care for animal visitation. Volunteer was interviewed separately. Questions focused on participants’ perceptions of benefits of therapy. Transcripts reviewed by both authors. Identified four themes 1) The Human</p>

	elderly.”			<p>Component – interactions with animals seemed to mimic human and gave human traits to animals, 2) Anticipation/Continuity – Residents appreciated regular visits by animals, 3) Reminiscence was facilitated by the animals, 4) Social Function – animals acted as intermediary to encourage communication, even with the lethargic.</p>
Serpell, J. (1991).	Three group prospective	N = 71 new pet owners; 26 non-pet owners	Evaluated health, psychological state, and exercise levels over 10 months	<p>Participants completed checklist of minor health complaints, information on recreational walks, and General Health Questionnaire at baseline, one month, six months, and ten months. New pet owners completed baseline about time pet was obtained. Groups were essentially equal except that non-pet owners had fewer children, higher socioeconomic class, and less likely to have access to gardens. Dog owners showed substantial sustained increase in walks from baseline as well as improved health scores. Cat owners had decreased health complaints at one month but this was not sustained. Non-owners remained essentially the same.</p>
Shore, E., Douglas, D., & Riley, M. (2005).	Survey	N = 501 nontraditional college students	Pet owner behaviors; attachment	<p>Goals: compile &amp; categorize owner behaviors, particularly beneficial ones and utility of attachment scales. Tools: 1) 85 pet owner behavior questions developed by authors. Based on 8 categories of beneficial activities – food, shelter, etc. 2) Lexington Attachment Scale (LAPS). 3) Semantic differential scale about attachment to pets 4) demographics. Reliability of scales was not discussed. Dogs were most common pet. LAPS &amp; Semantic differential scale correlated well (<math>r = 0.76</math>) Attachment was grouped by score as low, moderate, and high. 18 of the 85 author developed items were discarded. Ended up with four categories of pet care (essential, standard, enriched, &amp; luxury). Statistical</p>

				<p>analysis beyond percentages were not conducted “large number of items and accompanying increased likelihood of Type 1 errors precluded statistical analysis of item responses by attachment level”. Nearly all respondents carried out essential care. Numbers decreased as level of care increased. Also, lower attachment was less likely to be associated with Luxury care. Anomaly in that more with low attachment had dog house. Attachment was more discriminative at higher levels of care. Even with low levels of attachment, owners will provide basic care.</p>
Siegel, J. M.	Two-group comparison	N = 938 Medicare enrollees	IV = pet ownership; DV = physician contacts; also looked at stressful life events	<p>Followed participants every two months for a year. Baseline measures of health status, health beliefs, psychological distress, social network and support, pet ownership, and demographics. Pet aspects (responsibility, time with pet, affective attachment, and cost benefit) two months into the study. Physician contact was assessed every two months. Psychological distress (depression and stressful life events) was assessed at baseline, six, and twelve months. Only 37% owned pets. Pet ownership was associated with fewer total physician contacts and participant initiated physician contacts. As stressful life events increased, the number of physician contacts increased for non-pet owners, but not pet owners. Dog ownership was associated with fewer physician visits.</p>
Souter, M. A., & Miller, M. D. (2007)	Meta analysis	N = 5 studies meeting criteria	Effectiveness of animal assisted activities (AAA) on depression	<p>Inclusion criteria a) random assignment, b) control group, c) use of either AAA or AAT, d) measure of depressive symptoms. Sites of studies were long term care and psychiatric facilities. Results demonstrated medium effect size with the use of AAA/AAT on depressive symptoms.</p>
Staats, S.,	Descriptive	N = 485	Attachment,	Attachment has been a prominent feature of previous

<p>Pierfelice, L., Cheongtag, K., &amp; Crandell, R. (1999).</p>		<p>students at a commuter campus. 405 pet owners. Focused on those over 21.</p>	<p>commitment</p>	<p>connections between humans and pets. Instruments included Pet Attachment Scale, Miller-Rada Commitment to Pets Scale, self-care items, pet care items, and personal health state. This article adds the concept of commitment. Although different, they can be described as overlapping. Commitment is defined as the resolve to keep a pet in spite of personal challenges, such as cost, time, etc. Elements of the model include commitment to the pet, attachment to a pet, pet care behaviors, human self-care behaviors, and personal human health. Used structural equation modeling to develop model in which pet attachment, commitment to a pet, and human self-care all contributed to improved well-being associated with pet ownership.</p>
<p>Staats, S., Wallace, H., &amp; Anderson, T. (2008)</p>	<p>Descriptive</p>	<p>N = 241 college students and 102 adults</p>	<p>Explore reasons for pet ownership</p>	<p>Avoidance of loneliness most common reason for pet-keeping. Other common reasons included keeping active, useful function, and helpful in hard times.</p>
<p>Straede, C. M., &amp; Gates, R. (1993).</p>	<p>Two group comparison</p>	<p>N = 92 cat owners; N=70 non-pet owners Convenience sample</p>	<p>IV = cat ownership; DV = psychological health, depression, anxiety, &amp; sleep disturbance</p>	<p>Hypothesis: cat owners would be more psychologically healthy and be more nurturing and have a more favorable attitude toward pets. Tools used Pet Attitude Scale, Sleep Disturbance Questionnaire, Nurture Scale, General Health Questionnaire, Beck Depression Inventory, Marlowe-Crowne Social Desirability Scale, State-trait Anxiety Inventory, and Stressful life Events Scale. Non-pet owners included more males, more single, and more employed. Cat owners demonstrated less psychiatric disturbances and more positive attitude toward pets. Differences between pet owners and non-owners on other scales were not significant.</p>
<p>Stallones, L.,</p>	<p>Descriptive,</p>	<p>N = 1300</p>	<p>IV =</p>	<p>Phone survey that fairly well reflected census data.</p>

<p>Marx, M. B., Garrity, T. E., &amp; Johnson, T. P. (1991).</p>	<p>correlational</p>	<p>national probability sample ages 21-64 years</p>	<p>demographics, Self-Perception of Health, Recent Negative Life Events (added pet question), Human Social Networks (modified), Pet Attachment. DV= Emotional Distress (CES-D), Illness Behavior (researcher devised – meds, visits, etc.)</p>	<p>Grouped into three age ranges, 21-34, 35-44-45-64. Major finding was that pet ownership and attachment was associated with fewer social networks, overall illness behavior, and emotional distress. Other relationships were not significant. Demonstrates that pet ownership may not always be helpful or is very complex and varies considerably.</p>
<p>Straatman, I., Hanson, E., Endenburg, N., &amp; Mol, J. (1997).</p>	<p>Experimental</p>	<p>N = 36 male college students</p>	<p>IV = stressor of speech task in presence or absence of dog; DV = HR, BP, MAP, state anxiety; covariate chronic stress</p>	<p>Subjects completed a resting period watching chimpanzee film and completed State-Anxiety scale. This was followed by a preparation for speech task (seven minutes) and giving a brief speech on an assigned topic. A dog sat on the lap of the experimental group during preparation and delivery of the speech. BP and HR were monitored continuously. State anxiety was assessed at the end of the experiment. Mean HR, SBP, DBP, and MAP for each portion of the test were calculated. Findings indicated a significant increase in physiological parameters from the resting condition to the stressor. No differences between the experimental and control group were noted.</p>
<p>Wilson, C. C. (1991).</p>	<p>Within group comparisons</p>	<p>N = 92 college students</p>	<p>IV = reading aloud, quiet reading, &amp; petting unfamiliar dog;</p>	<p>Results demonstrated decreased state anxiety with quiet reading and petting dog. Greatest increase in state anxiety was noted with reading aloud. Trait anxiety remained stable. No differences between pet owners and</p>



Zasloff, R. L., & Kidd, A. H. (1994).	Correlational	N = 148 adult female students, 59 pet owners and 89 non-pet owners. Average age = 28.4 years	DV = BP, HR, state-trait anxiety Relationship among loneliness, pet ownership, and attachment.	non-pet owners. Men experienced higher baseline anxiety but decreased once a treatment began. Used Pet Relationship Scale & Revised UCLA Loneliness Scale. No differences in loneliness between pet owners & non-pet owners or between dog & cat owners on either loneliness or attachment. Those living only with a dog were significantly more attached than if lived with others; not so with cats. Hypothesis that highly attached owners would be less lonely was not supported. Hypothesis that women living entirely alone would be more lonely than those living with either pets or people was supported. Hypothesis that dog and cat owners showed no difference in mean loneliness or attachment was supported.
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## Appendix B

### Stephens College Pet Floor Program Agreement **Pet Floor Program Agreement**

- Pets (in addition to fish in aquariums) are allowed on the first floor of Prunty and designated spaces in Searcy only.
- Air conditioning is not available in Searcy and Prunty.
- Each resident will pay a \$200 pet deposit, refundable only if there is no damage caused to the room by the pet. Deposits must be paid before the start of school or you will not be allowed to bring your pet.
- **A recent picture of your pet must be submitted with this agreement.**
- **Cats and Dogs must be registered with the City of Columbia and you can do that on the [www.gocolumbiamo.com](http://www.gocolumbiamo.com) website or with a local vet clinic.**
- The only pets that will be allowed include:
  1. **Cats**—must be altered; litter box trained; current on all vaccinations, including FVCRP, rabies, FELV/FIV negative; current on flea/tick preventatives; must be registered with the City of Columbia and must wear tags.
  2. **Dogs**—under 40 lbs and a minimum of 12 months old no exceptions will be made. They must be house broken; altered; current on all vaccinations, including DHLPPV, rabies, and bordatella; heartworm tested; current on flea/tick preventatives; must be registered with the City of Columbia and must wear tags. Dogs must be crated when student is not in the room. The student is responsible for removing all fecal matter created by her dog on college property. Dogs must be groomed regularly, however, not in College bathrooms.

Students are responsible for ensuring that the pet that they bring to Stephens College will not cause a great deal of noise (e.g. barking, howling, etc.) that will disturb other residents and/or their pets. Students with dogs are encouraged to bring training devices such as shock or spray collars that will discourage their pets from creating an unnecessary amount of noise in the residence halls. Students are strongly encouraged to purchase and try out these training devices prior to bringing their pets to campus. Students with noisy pets will be given a 3-week grace period at the beginning of the semester to get their pet adjusted to life in the residence halls. If at the end of the 3 week grace period the pet is still causing disruption to the living community the following steps will be taken:

1. Verbal warning
2. Written warning
3. Removal of pet

\*\*Unnecessary amount of noise include the pet being heard outside the room during quiet hours or an excessive amount during the day when respect hours are in effect.

The following dog breeds, or any derivative there of, are not permitted in the residence halls for insurance reasons:

1. Pit bull
2. Rottweiler
3. German Shepard
4. Chow

5. Akita

3. **Rabbits, hamsters, rats, mice, gerbils sugar gliders, and guinea pigs**— must be kept in an aquarium or other appropriate housing when student is not in the room.

4. **Birds**—must be kept in cage or other appropriate housing when student is not in the room.

- Each student will be expected to properly care for her animal and the animal is not to be left during breaks. A fine of \$250 will be assessed to any student who is not properly taking care of her animal or leaves the animal behind without supervision during breaks, weekends or when leaving for any other reason.
- Students will have the opportunity to foster pets from Columbia Second Chance. CSC has agreed to keep the fostered animal during breaks and will provide food and medical care. You must provide all proper paperwork for each animal that you foster and notify the RD when you get a new animal.
- To assist in eliminating odors, pet waste is to be disposed of in the trash dumpster outside the building, not in the trashcans inside.
- Pets are to be kept in the pet owner's room only, not in the common areas.
- The student is responsible for making sure that her pet is not in violation of quiet hours.
- Only one pet per room will be allowed.
- The College reserves the right to remove a resident and/or her pet if the pet is not properly taken care of or if there is a violation of the pet policies.
- Emergency contact information must be posted on the inside of the resident's door at all times.
- Security, in consultation with Deb or Lory, has the authority to remove a pet that is displaying unacceptable behavior immediately.
- Students who wish to live on the pet floor without a pet must have special permission from the Director of Residence Life. Permission will be granted as space permits.

Any violations of this agreement will be sent to the Stephens College Judicial Board.

I agree to live by the policies set forth in this document:

\_\_\_\_\_  
Student Signature

\_\_\_\_\_  
Date

# PET FLOOR INFORMATION SHEET

Your Name \_\_\_\_\_

Email \_\_\_\_\_ Phone \_\_\_\_\_

Pet's Name \_\_\_\_\_ Age \_\_\_\_\_

Breed (ex. Beagle, Yorkie, etc.) \_\_\_\_\_ Color \_\_\_\_\_

Special Health Concerns for Your Pet \_\_\_\_\_

\_\_\_\_\_

What steps have you taken to prepare your animal for living in a community environment?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Prior to moving in, all students who live on the Pet Floor are required to submit proper documentation from a veterinarian and the deposit as outlined in the Pet Floor Program Agreement. All documentation must be submitted to the Residence Life office no later than 10 days prior to moving into the residence halls.

\_\_\_\_\_  
Student Signature

\_\_\_\_\_  
Date

## Appendix C

### Recruitment E-mail message and Flier

Attention Students!

You are invited to participate in a research study about pets and college students. I am interested in finding out if those of you with pets on campus are different from those without a pet. Students who have a pet and those who do not are invited to participate. I will be asking about your attachment to humans and pets, anxiety, and how you have adjusted to college life. If you are a continuing student at Stephens, I will ask you to sign consent form that would allow the Registrar to provide me with your grade point average. Your responses and your GPA would remain confidential.

I will start collecting data from students with pets on February 2, 2009. Then I will collect data from those without pet on February 4, 2009. I would appreciate it if you could spend about 40 minutes completing the questionnaires. I will be attending residence hall meetings and I will have an informational table set up at various locations on campus. In return for completing this survey, you will receive a coupon to a local restaurant worth \$6.

I hope to see you soon!

Shari Kist

MU Doctoral Student

[kists@missouri.edu](mailto:kists@missouri.edu)



Jan. 26, 2009

Trouble viewing this email? [Click here.](#)

## Campus Announcements

### Recyclemania

Recyclemania, a 10-week competition among hundreds of colleges nationwide, is being held through March 28 on the Stephens campus. Students, faculty and staff can participate in the competition by recycling all paper, plastic and aluminum materials in the recycling bins located around campus. Sponsored by the Student Government Association.

### Pilates classes

Pilates will be offered at The Health Connection at 8:30 a.m. on Tuesdays and Thursdays, beginning on Jan. 27. It will be taught by Steffanie White, dance instructor at Stephens and certified Pilates instructor. This special class will only be around until March 7, so take advantage of this great opportunity to get fit with Steffanie! For more information, call 882-1718.

## Faculty/Staff Corner

### Staff: Mark your calendars!

The SAC Coffee will be held at 10 a.m. on Monday, Feb. 16 in Windsor Lounge. Coffee and tea provided. You are welcome to bring your breakfast if you like. We hope to see everyone there.

—Staff Advisory Council

## Student Notices

### Research Study

You are invited to participate in a research

## Helpful Links

[Dining Menu](#) | [Student Message Board](#) | [Campus Directory](#)

[Printer-Friendly Version](#)

## Calendar of Events

*A two-week guide to upcoming events*

### Stephens Basketball vs. Saint Louis College of Pharmacy

*7 p.m., Feb. 3; John and Mary Silverthorne Arena*

### Stephens Basketball at Columbia College

*2 p.m., Feb. 7; Southwell Gymnasium, Columbia College*

### "All That Glitters"

*Through Feb. 8  
noon-3 p.m. Saturday-Sunday  
and 5:30-8:30 Thursday  
Historic Costume Gallery,  
mezzanine floor of Lela Raney  
Wood Hall*

*A collection of accessories  
from the late 19th and 20th  
centuries.*

*Free and open to the public.*

### You Know Where You Thought You Were

*Through Feb. 19*

study about pets and college students. Shari Kist, an MU doctoral student, is interested in finding out if students with pets on campus are different from those without a pet. Students who have a pet and those who do not are invited to participate. Questions will pertain to your attachment to humans and pets, anxiety and how you have adjusted to college life. You will be required to sign a consent form that would allow the Registrar to provide your grade point average. Your responses and your GPA would remain confidential. Data will be collected from students with pets on Feb. 2 and from those without a pet on Feb. 3.

Questionnaires will take about 20 minutes to complete. She will be in residence hall lobbies and at various locations on campus Feb. 2-6. In return for completing this survey, you will receive a coupon to a local restaurant worth \$6.

Questions? Contact Shari at [kists@missouri.edu](mailto:kists@missouri.edu) or (573) 864-0344.

*10 a.m.-3 p.m., Monday through Friday and by appointment  
Davis Art Gallery  
Installation art by Valerie Wedel and JJ Higgins.  
Free and open to the public.*

[More events](#)

[Add an event to the calendar](#)

**For students:** [Stephens event tracker](#)

If you have difficulty viewing this e-mail, [let us know](#). *Inside Stephens* is archived at <http://www.stephens.edu/news/campus/insidestephens/>.

### **Stephens College Mission Statement**

"Historically committed to meeting the changing needs of women, Stephens College engages students in an innovative educational experience focused on pre-professional fields and the performing arts and grounded in the liberal arts.

Graduates of Stephens are career-ready women of distinction, connected through a supportive network of alumnae across the world, confident in themselves, and inspired by our tradition of the *Ten Ideals* as core values that enrich women's lives."

[back to top](#)

# You Are Invited!

WHO: All Stephens Students

WHAT: Study of College Students  
and Pet Ownership

WHEN: February 2-6, 2009

WHERE: Residence hall meetings  
and Residence hall lobbies

All it takes is 40 minutes of your time to  
complete some questionnaires.

As payment for your time, you will  
receive a \$6 coupon to a local  
restaurant.

If you are interested, stop by one of the above locations  
If you have questions, contact me at [kists@missouri.edu](mailto:kists@missouri.edu) or  
573-864-0344





## Appendix D

### Student Adjustment to College Questionnaire

#### Sample of Questions from SACQ

1. I know why I'm in college and what I want out of it
2. I really haven't had much motivation for studying lately
3. I have been feeling lonely a lot at college lately
4. I have been getting angry too easily lately
5. I am pleased now about my decision to go to college

## Appendix E

### Relationship Questionnaire

There are two parts to this section of the questionnaire. Please be sure to complete both sections.

1. Following are four general relationship styles that people often report. Place a checkmark next to the letter corresponding to the style that best describes you or is closest to the way you are.

\_\_\_\_ A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

\_\_\_\_ B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

\_\_\_\_ C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

\_\_\_\_ D. I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

2. Please rate each of the following relationship styles according to the *extent* to which you think each description corresponds to your general relationship style.

	Not at all like me			Some what like me			Very much like me
It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.	1	2	3	4	5	6	7
I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.	1	2	3	4	5	6	7
I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.	1	2	3	4	5	6	7
I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.	1	2	3	4	5	6	7

Adapted from Department of Psychology, University of California Davis, California 95616-8686

## Appendix F

### State-Trait Anxiety Inventory

#### Sample of Questions from the State Anxiety Questionnaire

1. I feel calm
2. I fee satisfied
3. I feel confused

#### Sample of Questions from the Trait Anxiety Questionnaire

1. I feel pleasant
2. I feel like a failure

Appendix G

Lexington Attachment to Pets Scale

	<b>Strongly Agree 4</b>	<b>Somewhat Agree 3</b>	<b>Somewhat Disagree 2</b>	<b>Strongly Disagree 1</b>
My pet means more to me than any of <i>my</i> friends.				
Quite often I confide in my pet.				
I believe that pets should have the same rights and privileges as family members.				
I believe my pet is my best friend.				
Quite often, my feelings toward people are affected by the way they react to my pet.				
I love my pet because he/she is more loyal to me than most of the people in my life.				
I enjoy showing other people pictures of my pet.				
I think my pet is just a pet.				
I love my pet because it never judges me.				
My pet knows when I'm feeling bad.				
I often talk to other people about my pet.				
My pet understands me.				
I believe that loving my pet helps me stay healthy.				
Pets deserve as much respect as humans do.				
My pet and I have a very close relationship.				
I would do almost anything to take care of my pet.				
I play with my pet quite often.				
I consider my pet to be a great companion.				
My pet makes me feel happy.				

I feel that my pet is part of my family.				
I am not very attached to my pet.				
Owning a pet adds to my happiness.				
I consider my pet to be a friend.				

(Johnson et al., 1992)

## Appendix H

### Demographic Questionnaire

1. Did you have a pet as a child?
  - 1) Yes
  - 2) No, please SKIP to question 5
  
2. If yes, what kind of pet did you have?
  - 1) Dog(s)
  - 2) Cat(s)
  - 3) Other(s) specify\_\_\_\_\_
  
3. At what age can you recall first having pets?
  - 1) Never
  - 2) Childhood (1-12 years of age)
  - 3) Adolescence (13-18 years of age)
  - 4) Young Adulthood (19-30 years of age)
  
4. At what age did you become responsible for care of your pet(s)?
  - 1) Never
  - 2) 5-9 years of age
  - 3) 10-14 years of age
  - 4) 15-19 years of age
  
5. What is your current status of pet ownership?
  - 1) No pet at present time on campus
  - 2) Have own pet in residence hall
  - 3) Have a foster pet in residence hall
  - 4) Have horse stabled at Stephens College
  
6. Have you had a pet any time while attending college?
  - 1) Yes. Briefly explain the circumstances for your change in pet ownership\_\_\_\_\_
  - 2) ownership\_\_\_\_\_
  - 3) No
  
7. If you have a pet in the residence hall, how long have you had the current pet?
  - 1) Less than 6 months
  - 2) 6 months to 1 year
  - 3) 1 to 1 ½ years
  - 4) 1 ½ - 2 years
  - 5) over 2 years
  
8. If you have a pet in your residence hall, what type of pet is it?\_\_\_\_\_
  
9. Do you currently have a pet at your permanent residence?
  - 1) Yes
  - 2) No

10. If you answered yes to Question 9, what type of pet do you have at your permanent residence?

\_\_\_\_\_

11. How often do you visit your permanent residence (parents' home)?

- 1) Weekly
- 2) Monthly
- 3) Twice a semester
- 4) Summers and between semesters
- 5) Yearly
- 6) Never

12. Do you plan to continue with pet ownership and/or obtain a pet later in life?

- 1) Yes
- 2) No

13. What is your age? \_\_\_\_\_

14. What is your year in college?

- 1) Freshmen
- 2) Sophomore
- 3) Junior
- 4) Senior
- 5) Graduate student

15. What is your major? \_\_\_\_\_

16. What is your marital status?

- 1) Single
- 2) Married
- 3) Cohabiting
- 4) Divorced

17. What is your gender?

- 1) Male
- 2) Female

18. What are your living arrangements while attending classes?

- 1) Single room in residence hall
- 2) Two or more roommates in residence hall
- 3) Apartment on campus
- 4) Other (please specify) \_\_\_\_\_

19. How many siblings do you have? \_\_\_\_\_

20. What is your ethnic background?

- 1) African American
- 2) American Indian
- 3) Asian
- 4) Caucasian



- 5) Hispanic/Latin
- 5) Other (specify) \_\_\_\_\_

*Thank you for taking the time to complete this survey!*  
*Shari*

Appendix I

Consent for Release of Grade Point Average  
Consent for Release of Grade Point Average to Sharon Kist

By signing this form, I give permission to Sharon Kist to receive a report my Grade Point Average (GPA) for grades earned while attending Stephens College. This information will be kept secure in a locked file and will be used only by Sharon Kist.

The information will be used to describe the sample of college students and to compare those who have a pet with those who do not. The aggregate findings will be reported in her dissertation and potential subsequent journal publications and presentations. However, the information will not reported in a manner that includes my name or other identifying information.

\_\_\_\_\_  
Name (please print clearly)

\_\_\_\_\_  
Student ID Number

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

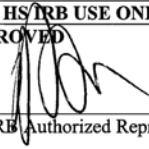
\_\_\_\_\_ Check here if you are a first semester freshman at Stephens College

Appendix J

Consent for Participation in Research Study

**CONSENT FORM TO PARTICIPATE IN A RESEARCH STUDY**

INVESTIGATOR'S NAME: SHARON E. KIST  
PROJECT # 1119977  
DATE OF PROJECT APPROVAL: DECEMBER 29, 2008

<b>FOR HS/IRB USE ONLY</b>	
APPROVED	
	1-2-09
HS IRB Authorized Representative	Date
EXPIRATION DATE:	12-29-2009

**Study Title: Correlates of Pet-Keeping in Residence Halls on College Student Adjustment at a Small Private Midwestern College.**

**INTRODUCTION**

**This consent may contain words that you do not understand. Please ask the investigator to explain any words or information that you do not clearly understand.**

This is a research study. Research studies include only people who choose to participate. As a study participant you have the right to know about the procedures that will be used in this research study so that you can make the decision whether or not to participate. The information presented here is simply an effort to make you better informed so that you may give or withhold your consent to participate in this research study.

Please take your time to make your decision. You are being asked to take part in this study because you are enrolled at Stephens College. In order to participate in this study, it will be necessary to give your written consent.

**WHY IS THIS STUDY BEING DONE?**

The purpose of this study is to determine if keeping a pet in the residence hall makes a difference in academic and social adjustment to college.

**HOW MANY PEOPLE WILL TAKE PART IN THE STUDY?**

About 128 people will take part in this study at Stephens College.

**WHAT IS INVOLVED IN THE STUDY?**

If you take part in this study, you will be asked to complete a questionnaire and sign a consent allowing the Registrar's office to release your grade point average (GPA) to the principle investigator.

**HOW LONG WILL I BE IN THE STUDY?**

You will need to spend about 40 minutes completing the questionnaire and signing your GPA consent.

You can stop participating at any time. Your decision to withdraw from the study will not affect in any way your health care or future in college.

**WHAT ARE THE RISKS OF THE STUDY?**

It is possible that the items on the survey may trigger painful or disturbing thoughts. If you feel this is too stressful, do not hesitate to tell the investigator and you may stop at any time. There may be other risks that have not yet been identified. You may contact the investigator at 573-864-0344.

**ARE THERE BENEFITS TO TAKING PART IN THE STUDY?**

If you agree to take part in this study, there may or may not be direct benefits to you. You may expect to benefit from taking part in this research to the extent that you are contributing to a better understanding of college students. We hope the information learned from this study will benefit future students.

**WHAT OTHER OPTIONS ARE THERE?**

An alternative is to not participate in this research study.

**WHAT ABOUT CONFIDENTIALITY?**

Information produced by this study will be stored in the investigator's file and identified by a code number only. The code key connecting your name to specific information about you will be kept in a separate, secure location. Information contained in your records may not be given to anyone unaffiliated with the study in a form that could identify you without your written consent. Information regarding your GPA will be supplied to the principle investigator who will use the information only for the purposes of describing the sample of college students and for comparing students who do and do not keep pets in the residence hall.

The results of this study may be published in a journal or used for teaching purposes. However, your name or other identifying information will not be used in any publication or teaching materials without your specific permission.

**WHAT ARE THE COSTS?**

There is no cost to you for participating in this study.

**WILL I BE PAID FOR PARTICIPATING IN THE STUDY?**

You will receive no direct payment for taking part in this study. You will receive a coupon for a local restaurant worth a nominal amount upon completion of the questionnaire.

**WHAT ARE MY RIGHTS AS A PARTICIPANT?**

**Participation in this study is voluntary. You do not have to participate in this study. Your present or future care and education will not be affected should you choose not to participate.** If you decide to participate, you can change your mind and drop out of the study at any time without affecting your present or future health care or academic career.

**WHOM DO I CALL IF I HAVE QUESTIONS OR PROBLEMS?**

If you have any questions regarding your rights as a participant in this research and/or concerns about the study, or if you feel under any pressure to enroll or to continue to participate in this study, you may contact the University of Missouri Health Sciences Institutional Review Board (which is a group of people who review the research studies to protect participants' rights) at (573) 882-3181.

You may ask more questions about the study at any time. For questions about the study or a research-related injury, contact Sharon Kist at 573-864-0344.

A copy of this consent form will be given to you to keep.

**SIGNATURE**

I confirm that the purpose of the research, the study procedures, the possible risks and discomforts as well as potential benefits that I may experience have been explained to me. Alternatives to my participation in the study also have been discussed. I have read this consent form and my questions have been answered. My signature below indicates my willingness to participate in this study.

\_\_\_\_\_ Date \_\_\_\_\_  
Subject

**SIGNATURE OF STUDY REPRESENTATIVE**

I have explained the purpose of the research, the study procedures, identifying those that are investigational, the possible risks and discomforts as well as potential benefits and have answered questions regarding the study to the best of my ability.

\_\_\_\_\_ Date \_\_\_\_\_  
Study Representative

## Appendix K

### Consent for Photographs

By signing this form, I give permission to Sharon Kist to take pictures of myself and my pet at Stephens College. These photographs will be used as part of presentations made by Sharon Kist related to the conduct of her study, *Correlates of Pet-Keeping in Residence Halls on College Student Adjustment at a Small Private Midwestern College*. These photographs will be used only for academic purposes and not for commercial purposes. The names and personal information about participants and their pets will not be included on either the picture or during presentations.

The cumulative findings of this study will be reported in her dissertation and potential subsequent publications. However, the information will not reported in a manner that includes your name or other identifying information.

---

Subject

---

Date

## VITA

Sharon E. Kist was born September 5, 1958 in Kirksville, Missouri. She graduated from Knox County R-1 High School, Edina, Missouri in 1976. In 1980, she graduated from Northeast Missouri State University, now known as Truman State University, Kirksville, Missouri. In 1993, Sharon earned her Master's in Nursing from the University of Missouri-Columbia, Columbia, Missouri. She started the doctoral program in 2004 and completed the pursuit in May of 2009.

Sharon has been involved in nursing practice since she graduated from her baccalaureate program, primarily practicing medical-surgical nursing. She has been involved in nursing education since 1988, teaching in both associate and baccalaureate programs. Her teaching methodologies have included face-to-face teaching, as well as telecommunication and online course delivery methods. Sharon plans to continue as a nursing faculty member, blending the roles of teaching and research.