

WHO LET THE THERAPY DOGS OUT?
THE IMPACTS OF THERAPY DOG ASSISTED ACTIVITIES ON
UNDERGRADUATE STUDENTS' PERCEIVED
STRESS LEVELS

by

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DEDICATIONS

This thesis is dedicated to my mom and dad,
Thank you for your unconditional love and support.

I owe so much of my success to you.

I love you.

And to my sisters Christina and Heather and my brother Michael,
You can do anything if you put all of your heart and mind into it.

Although I am miles away from home,

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I love you and I love being the “family nerd.”

I can do all things through Christ, who strengthens me.

Philippians 4:13

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LIST OF ABBREVIATIONS

Abbreviation	Description
AAA	Animal-Assisted Activities
AAT	Animal-Assisted Therapy
AEQ	Academic Emotions Questionnaire
SLAC	Student Learning Assistance Center
SSRSL	Student Self-Reported Stress Level measure
Time 1	The <i>before</i> condition. Refers to the time frame of the study when all of the participants entered SLAC.
Time 2	The <i>during</i> condition. Refers to the time frame of the study when participants were engaged in their studies either with the therapy dogs present (TDAA group) or when the therapy dogs were absent (control group).
Time 3	The <i>after</i> condition. Refers to the time frame of the student when all of the participants left SLAC.
TDAA	Therapy Dog Assisted Activities

CHAPTER I

INTRODUCTION

Chapter I presents the introduction, purpose, rationale, and significance of this study. This provides an insight as to why this study was designed and what types of information it is designed to contribute to empirical literature. This chapter also presents a detailed breakdown of the research questions used to guide this study and the definition of key term used throughout this paper. Lastly, Chapter I presents how this thesis is structured and what will be presented in each of the following chapters.

Exam-related stress is a common predicament faced by a majority of college students (Kavakli, Li, & Rudra, 2012) and has been recognized in literature as an important area of study, given the potential of detrimentally health, emotional, and educational outcomes (Putwain, 2007). Although stress has been defined as a state of mental or emotional strain or tension one experiences in response to a threat or a demanding circumstance (Anxiety and Depression Association of America, n.d.; Goodnite, 2014; Manenica & Šimić, 2012) the term “stress” in North American and Western European literature tends to lack a clear definition. Research suggests that stress is a normal and useful response to the body and is a nonspecific response the body has in response to any demand (Selye, 1977). The lack of a clear definition presents conceptual difficulties in understanding how stress of being used within the literature as it has been used interchangeably with terms such as “anxiety” and “worrying.”

According to Putwain (2007), the term stress has at least two clear referents:

First, it is used to refer to the characteristics of a stimulus or situation, which causes stress (e.g. “examinations are stressful situations”). Second, it is used to

refer to a response; the subjective experience of feeling stress, and emotional state which may be accompanied by feelings of anxiety and or worry (i.e. “I worry about failing examinations”).

For the purpose of this study, the term stress refers to the “situation that causes,” rather than the “response to the cause” for a variety of reasons. First, stress in this study is *non-specific*, meaning it includes a variety of additional potential stressors (i.e. external demands/final exams) to responses (e.g. the need for academic success) (Burton & Hinton, 2004). Second, no two individuals are identical, meaning that no two individuals will react to stress the same way (Selye, 1977) and will ultimately respond to stress differently. Lastly, exam-related situations that cause stress assumes that the presence of the stress will result in some sort of emotional distress such as anxiety or worry (Putwin, 2007).

Overall, the stress that students most typically report experiencing is often associated with the pressure of academic achievement, which can peak during final exam periods at the conclusion of an academic semester (Bardi, Koone, Mewldt, & O’Conner, 2011). Research has indicated that if these intense stress levels are not regulated or monitored, students may experience extreme, and in some cases destructive, side effects (Abella & Heslin, 1989; Matchock & Polheber, 2013). As a result, institutions have been spending a great deal of time and money investing in different types of interventions and stress management services to respond to the high need for stress reduction in students’ academic lives (Anderson & Cole, 1988).

One such intervention, which has quickly been gaining the attention of institutions nationwide, is the use of therapy dogs in the postsecondary educational setting (Astroino, Bombay, & Jalongo, 2004). Although most research conducted with therapy dogs has

been conducted in elementary, middle, and high schools (Bell, 2013), there is little empirical research that addresses the effects therapy dogs have on postsecondary students. This study was designed to investigate the impacts therapy dogs have on these students to help institutions better support their students during stressful time periods.

Purpose of Study

This study had two major purposes. The first was to determine if therapy dogs played a significant role in helping students reduce the amount of stress they were experiencing while they were studying for their end of the semester final exams. Research suggests that when individuals are experiencing high levels of stress, they can experience some relief by interacting with a therapy dog or calm companion animal (Astroino et al., 2004; Bell, 2013). There is little data however on the impact in academic settings. This study sought to examine whether the therapy dogs had a significant impact on students' stress levels during final exam time.

The second purpose was to examine if there was a gender difference in perceived stress levels during final exams and if the interaction with the therapy dogs played a stronger role in helping one gender reduce their stress levels compared to the other. Research suggests that during stressful situations, females tend to report experiencing more intense stress-related symptoms because they are more emotionally involved in the stressor(s) compared to males (Carpenter, Kelly, Proce, & Tyrka, 2008; Lloyd, Turner, & Wheaton, 1995). Research also suggests that interaction with a therapy dog can help one relax during a stressful situation, regardless of gender (Barker, Knisely, McCain, Pandurangi, & Schubert, 2010).

Rationale and Significance of this Study

Given the many new experiences and challenges college students face during their undergraduate career, it is not surprising that students report experiencing a substantial levels of stress during the academic semester (Lust, Ehlinger, & Golden, 2010). According to Lust et al. (2010), 45% of college students reported experiencing at least two major stressors over a 12-month period, and of those students, 26% were unable to manage the intense levels of stress they were experiencing. Being able to manage one's stress levels is essential to students' overall wellbeing, as numerous of studies have identified connections between academic related stressors and negative health behaviors (Frazier, Hintz, & Meredith, 2015). Research has documented that one of the most stressful experiences college students face during their time as an undergraduate student is final exams (Anderson & Cole, 1988, Kavakli et al., 2012). During final exam times, students may feel that they are not in control of their stress levels, which can have seriously negative impacts on their physical, mental, and emotional well-being, which can ultimately impact how well students can perform on these exams.

In response to the findings presented in literature on student stress, institutions are becoming more involved in offering programs to students to help them manage their stress levels during these stressful time periods, such as online intervention programs, professional school counselors, and other support programs (Frazier et al., 2015). Many students, however, are not using these programs or seeking help when experiencing intense levels of stress (Eisenberg, Golberstein, & Gollust, 2007). This may be due to the negative stigma associated with mental health services or treatment (Moses, 2009). This study seeks to examine one promising way to meet the student's needs in a non-

stigmatizing way, while still being affordable, effective, and practical for intuitions to implement.

Many prestigious universities have begun implementing the use of therapy dogs on their campuses (Heath, Hetherly, Nichols, Weathers, & Wood, 2013). Therapy dogs have recently become more popular on college campuses and have been used by faculty to help provide some sort of relief to their students (Dogar, Eman, Haider, & Khalid, 2012), as it has been suggested that animal assisted therapy can be beneficial in helping people reduce their stress levels (Gonzalez-Ramirez, Landero-Hernandez, Ortiz-Jimenez, 2013; Matchock & Polheber, 2013).

Although there is published research available on the impacts of therapy dogs on stress levels, the majority of these studies were conducted in hospitals, therapy centers, and primary thru secondary schools (kindergarten through 12th grade) (Bell, 2013). There is little research conducted on how therapy dogs impact postsecondary students during extremely stressful time, such as final exams. While the findings from previous research have been applied to the postsecondary educational setting, it has not been until recently that there has been empirical data to support the hypothesis that therapy dogs have similar effects on college students' stress levels as it does on younger student populations. Ultimately, this study was designed to add to the knowledge in this area by examining the role of Therapy Dog Assisted Activities (TDAA) on college students' perceived stress levels.

Research Questions

Research Question 1: Is there a significant difference between students' perceived stress levels across Time 1, Time 2, and Time 3?

- a. Is there a significant difference in reported stress levels between the control and the TDAA group at each time frame?
 - i. Is there a significant difference in reported stress levels between the control and the TDAA group at Time 1?
 - ii. Is there a significant difference in reported stress levels between the control and the TDAA group at Time 2?
 - iii. Is there a significant difference in reported stress levels between the control and the TDAA group at Time 3?
- b. Is there a significant difference in the changes of reported stress levels between time frames for both the control and the TDAA group?
 - i. Is there a significant difference in the changes of reported stress levels from Time 1 to Time 2 in the control and the TDAA group?
 - ii. Is there a significant difference in the changes of reported stress levels from Time 2 to Time 3 in the control and the TDAA group?
 - iii. Is there a significant difference in the changes of reported stress levels from Time 1 to Time 3 in the control and the TDAA group?

Research Question 2: Is there a significant difference between females' and males'

perceived stress levels across Time 1, Time 2, and Time 3?

- a. Is there a significant difference between females' and males' reported stress levels at each time frame for the control and then TDAA group?
 - i. Is there a significant difference between females' and males' reported stress levels at Time 1 for the control and the TDAA group?

- ii. Is there a significant difference between females' and males' reported stress levels at Time 2 for the control and the TDAA group?
 - iii. Is there a significant difference between females' and males' reported stress levels at Time 3 for the control and the TDAA group?
- b. Is there a significant difference in the changes of reported stress levels between time frames for males and female in both the control and the TDAA group?
 - i. Is there a significant difference in the changes of reported stress levels in males and females from Time 1 to Time 2 for both the control and the TDAA group?
 - ii. Is there a significant difference in the changes of reported stress levels in males and females from Time 2 to Time 3 for both the control and the TDAA group?
 - iii. Is there a significant difference in the changes of reported stress levels in males and females from Time 1 to Time 3 for both the control and the TDAA group?

Definition of Key Terms

Academic stress: A state of mental or emotional strain or tension in response to environmental constraints that involve important life and educational goals where expected outcomes can be thought of as the proximity or the likelihood of achieving an academic goal (Bardi et al., 2011).

Animal Assisted Activities (AAA): Activities designed to provide motivational opportunities that can benefit a participant(s)' overall quality of life by using trained animals (Fine, 2006). AAA is a less intensive therapy as it does not always require the documentation of patient/animal interaction and typically does not have to pre-determined set schedule (Pet Partners, n.d.).

Animal Assisted Therapy (AAT): A goal-directed practice where practitioners work with animals to develop interventions within their area of expertise (Evans & Gray, 2011). The AAT animals must meet specific criteria in order to be of assistance in the treatment process and to ensure that the animal is assisting the patient to reach specific goals (Evans & Gray, 2011; Fine, 2006).

Control Group: Traditionally in experimental research, the control group consists of participants who are not given experimental treatment (Davidson, Freedland, Mohr & Schwartz, 2011). For the purpose of this study, the control group refers to the participants who did not interact with the therapy dogs.

Coping: An individual's attempts to change behavioral and cognitive strategies in efforts to manage and regulate demands (both internal and external), pressures, and emotions in response to stress (Folkman and Lazarus, 1980).

Stress: A state of mental or emotional strain or tension one experiences in response to a threat or a demanding circumstance (Anxiety and Depression Association of America, n.d.; Goodnite, 2014; Manenica & Šimić, 2012). For the purpose of this study, the term stress refers to the "situations that cause" the "response," is *non-specific*, and includes a variety of additional potential stressors (i.e. external demands/final exams) to responses (e.g. the need for academic success) (Burton

& Hinton, 2004), which can result in emotional distress (Putwin, 2007).

Student Learning Assistance Center (SLAC): A multi-faceted academic support center that provides tutoring services, Supplemental Instruction, learning and study skills workshops, and learning specialist consultants free of charge to students (Student Learning Assistant Center, n.d.). The SLAC is located on the fourth floor of the Alkek Library at Texas State University in San Marcos, Texas.

Therapy Dog Assisted Activities (TDAA) Group: For the purpose of this study the TDAA group refers to the experimental group of the study. Traditionally in experimental studies, the experimental group consists of participants whose behaviors are manipulated by an experimental variable (Freedheim & Weiner, 2003), which in the case of this study, is the interaction with the therapy dogs.

Organization of the Thesis

Chapter II presents a review of literature on stress (academic related stressors and exam-related stress), gender differences in stress and coping strategies, and TDAA practices. Chapter II also presents the findings of the therapy dog pilot study. Chapter III describes the procedures used in conducting this study, as well as description of the location, the Canine Divine Organization, and the statistical methods used to analyze the results. Chapter IV presents the results of the analysis. Chapter V presents a discussion of the results, implications and limitations of this study, as well as recommendations for further research.

Chapter Summary

Given the many new experiences and challenges college students face during their undergraduate career, it is not surprising that students report experiencing a high level of

stress during the academic semester (Lust, Ehlinger, & Golden, 2010). This includes the stress student report experiencing when the pressure of academic achievement increases, which can peak during final exam periods (Bardi, Koone, Mewldt, & O'Conner, 2011). Exam-related stress is a common predicament faced by the majority of college students (Kavakli, Li, & Rudra, 2012) and has been recognized in the literature as an important area of study, given the potential of detriment health, emotional, and educational outcomes (Putwain, 2007). In response to helping students better manage their stress during final exams, institutions have begun to implement therapy dog programs to better assist their students' needs. There is little evidence however of the effects of therapy dog assisted activities on student stress levels within the literature. This study was designed to provide empirical data to show the impacts therapy dog programs have on both males' and females' stress levels during final exam periods.

Chapter I provided the rationale and purpose for this study while also defining key terms that will be used in this study. In addition, this chapter also presented the research questions that were used to guide this study. Chapter II presents a review of literature that provides a foundational understanding of all of the elements analyzed in this study.

CHAPTER II

REVIEW OF RELATED LITERATURE

Chapter II presents a review of literature that provides a foundational understanding of all of the elements analyzed in this study. It addresses what stress is and the impacts stress can have on an individual if not properly managed. This chapter also identifies differences in stress-coping skills used by each gender and how these differences can impact the overall findings of this study. Chapter II also defines the therapy dogs that were used in this study and presents examples of how therapy dogs are being used in other types of educational and therapeutic settings.

Stress has been identified as a state of mental or emotional strain or tension one experiences in response to a threat or a demanding situation (Anxiety and Depression Association of America, n.d.; Goodnite, 2014; Manenica & Šimić, 2012). For the purpose of this study, the term stress has been defined to be *non-specific*, meaning it includes a variety of additional potential “situations that cause” (i.e. external demands such as final exams) to “responses to the cause” (e.g. the need for academic success) (Burton & Hinton, 2004) which can result in some sort of emotional distress (Putwin, 2007).

Academic stress differs from general stress as it stems from environmental constraints that involve important life and educational goals where expected outcomes can be thought of as the proximity or the likelihood of achieving an academic goal. The belief that one may not be able to successfully accomplish his or her goals is associated with negative affect, negatively impacting the level of stress one feels (Abella & Heslin, 1989; Bardi et al., 2011). For these reasons and more, students are susceptible to

immense levels of stress during exam periods (Anderson & Cole, 1988; Manenica & Šimić, 2012).

Research has indicated that stress at an optimal level can be extremely beneficial for students as it stimulates student to perform at their best levels, especially when taking exams (Kavakli et al., 2012, Putwain, 2007). Some stress is essential for college students, as the appropriate level of stress can boost concentration, self-disciplinary capabilities, and performance (Bardi et al, 2011). Conversely, when stress is improperly managed and monitored, it can lead to many destructive side effects for the student. These effects have gained the attention from many researchers who have investigated the effects of examination-related stress of academic exams on college students during their college careers (Kavakli et al., 2012)

The stress that college students experience is often associated with the pressure for academic achievement, which can peak during test and examination periods (Bardi et al., 2011). Exam-related stress has been a common predicament faced by students of all genders, age groups, and cultures; and the side effects can be extreme (Kavakli et al., 2012). If not addressed, those who experience intense levels of stress are more prone to experience illness, insomnia, depression, and other physical and psychological dysfunction (Abella & Heslin, 1989). As a result, institutions have been spending a great deal of time and money investing in various types of interventions and stress management services to respond to the high need for stress reduction in students' academic lives (Frazier et al, 2015).

The need for such interventions is evident through a simple Google search of final exams and stress related terms. In 2011, Rabschutz and Reynolds (2011) found that more

than 500,000 websites existed that were related to “final exams and student stress” available on Google. In March of 2014, the number of available websites grew to 719,000 and as of October 2015, that number has exceeded 1,810,000 (Google, 2015). The majority of these available websites are “self-help” websites that offer interventions, tips, and advice on how individuals can handle exam-related stress. As these numbers of “self-help” resources increase, more and more attention is being focused on the need to help bring some sort of relief to people, especially the student population (Bell, 2013). As these online self-help resources continue to increase, it is critical to address that the majority of them come from unreliable sources.

Gender Differences in Coping with Stress

It is clear that stress among college students has been prevalent across all students and is more severe for some students compared to others. One of the most noted differences in types of stress experienced or stress coping strategies used is identified through the gender of the student (Brougham, Mendoza, Miller, & Zail, 2009). Many studies have found that females tend to have a stronger reaction to stressful situations compared to males (Brougham et al., 2009; Dodge, Ptacek, & Smith, 1994; Matud, 2004). Additionally, findings from numerous studies have found that females tend to experience stress, anxiety, and depression more often and more intensely than their male counterparts (Carpenter et al., 2008). Females also tend to be more affected by stress because they tend to be more emotionally involved in the stressor(s) compared to males (Lloyd et al., 1995). Additionally, when presented with stressors that have some sort of emotional connection to females, they experience an increase stress-impacting hormones, which has been reported to increase the interpersonal responsiveness to the stressor

(Hitchman, Jackson, Li, Li, Qiu, Sun, Wei & Zhang, 2014). It is suggested that in highly stressful situations, changes in hormones can make females feel more sensitive to social and environmental stimuli (Hitchman et al., 2014). Consequently, the ratio of females-to-males who suffer from a higher prevalence of stress and other anxiety disorders is approximately 2:1 (Carpenter et al., 2008).

According to Hitchman et al. (2014), the way that people cope with stress may also depend on the individual's gender. Coping has been defined as an individual's attempts to change behavioral and cognitive strategies in efforts to manage and regulate demands (both internal and external), pressures, and emotions in response to stress (Folkman and Lazarus, 1980). Folkman and Lazarus (1980) describe two categories of coping behavior: problem-focused and emotion-focused coping. Problem-focused coping includes active coping as well as cognitive and behavioral attempts to either modify or eliminate the stressful situation. Emotion-focused coping attempts to regulate and change emotional responses to the stressful situation has been found to be less effective than problem-focused coping.

Although findings from gender differences in coping behavior studies are not definitive, it is suggested that females tend to rely more on emotional-focused coping strategies and males tend to rely on problem-focused coping strategies when stressors are presented (Hitchman et al., 2014). For example, females reported using emotional-focused coping strategies in response to stress by expressing their feelings, seeking emotional support, and reaching out to their social network. Whereas males, however, are less likely to vocalize their stress, ask for help or assistance, and typically avoid the stressors to manage the amount of stress they experience (Matud, 2004).

Several researchers (Balogun, Monteiro, & Oratile, 2014; Carpenter et al., 2008; Matud, 2004) have suggested that the strategies people use when stressed may be conditioned by traditional socialization patterns. In the college setting, females who endorse feminine values were more likely to use social support as their main strategy for coping with stress. Females are more likely to “tend and befriend” others when experiencing high levels of stress and to seek comfort and acceptance from their peers during these times. Also, more college females reach out for support from college student services, such as seeing a school counselor, therapist, or receiving stress management help, when feeling stressed (Balogun et al., 2014). Whereas college males were more likely to avoid stressors (which is typically followed by procrastination which can increase the level of stress one feels) and use alcohol and drugs as a coping strategy (Brougham et al., 2009). This is especially true in college settings as many males find that asking for help, stress management assistance, or professional guidance as a sign of weakness and lack of masculinity (Carpenter et al., 2008). Thus, it may be that the acceptance of traditional gender roles in the college setting has significantly impacted the way genders cope in stressful situations (Brougham et al., 2009; Dodge et al., 1994).

Identifying gendered ways of coping may provide more insight of how males and females handle high levels of stress while studying for their final exams. Because it is documented that males and females cope with stress differently (Hitchman et al., 2014), this study will examine whether there are differences in stress levels reported by the male and females.

Animal-Assisted Therapy and Activities

Over the last few decades, various forms of Animal-Assisted Therapy (AAT) and Animal-Assisted Activities (AAA) have become acceptable practices and methods of therapeutic practice in a wide array of settings including hospitals, libraries, elementary schools, and elderly care communities (Evans & Gray, 2011). The goals of the two programs share some overlap and as a result, the terminology used has been misrepresented in publications and in conversations. The differentiation of the two terms is critical to the understanding of the animal assisted intervention used in this study. AAT refers to a goal-directed practice where practitioners work with animals to develop interventions within the practitioners' area of expertise (Evans & Gray, 2011).

Practitioners and animals work to serve as a part of a treatment for a specific population who may be physically, socially, emotionally, or cognitively challenged (Pet Partners, n.d.). The AAT animals must meet specific criteria in order to be of assistance in the treatment process and to ensure that the dog is assisting the patient to reach specific goals (Evans & Gray, 2011; Fine, 2006). AAT typically works on a pre-determined schedule and set intervals to best fit the needs of a single patient where the interaction of the AAT animal and the patient can be monitored and recorded (Pet Partners, n.d.).

In contrast, AAA seeks to provide motivational opportunities that can benefit a participant(s)' overall quality of life (Fine, 2006). AAA is a less intensive therapy as it does not always require the documentation of patient/animal interaction and typically does not have a pre-determined set schedule (Pet Partners, n.d.). AAA animals and practitioners participate in casual "meet and greet" activities and less formal activities where the purpose of the human-animal interaction is not goal-oriented, nor is it designed

around a tailored therapeutic intervention (Evens & Gray, 2011). These animals are typically used in schools, residential rest homes, hospitals, libraries and recreational settings where they provide therapeutic benefits without the constraints of the AAT requirements (Fine, 2006).

Although the positive impacts of AAT/AAA on both children and adult overall wellbeing can be found through literature, it has been primarily through the mass attention that AAT/AAA has been receiving on social media that has been spreading the word about its success (Astorino et. al., 2004). This social media attention has led to a greater awareness and acceptance of these programs within the public. With a greater awareness of the existing AAT/AAA programs and the positive impacts they have had on children and adults, AAT/AAA has become a popular therapeutic treatment in many professional fields (Crosson & Foreman, 2012), resulting in numerous new AAT/AAA programs being developed and implemented throughout the country (Geist, 2011).

Research examining the physiological stress responses on adults who interacted with therapy dogs during a stressful activity suggests that adults who interacted with therapy dogs tend to experience a feeling of relaxation or calming (Barker et al., 2010). Yet there is a lack of empirical research to support the hypothesis that interactions with therapy dogs or AAA animals will reduce stress in college students. This study aims to address this lack in research.

Within literature and media publications, the terms AAA and AAT have been used interchangeably, although they are quite different. Also, terms such as “service dogs,” “assistance dogs,” and “emotional support dogs” have also been misused and incorrectly labeled in publications as well. However, according to the Guide of

Assistance Dogs Laws (Assistance Dogs International, n.d.), each type of assistance dog must comply with different legislation and laws that regulate the use of assistance dogs in private and public settings. To avoid any complications with legislation or university on-campus animal policies, it was important to correctly define what kinds of dogs were being used in this study and what kinds of activities were taking place.

In context of this study, the use of therapy animals (specifically dogs) fell under the definition of AAA. Because the use of the therapy dogs took place in a less formal “meet and greet” style setup for this study, the term “Therapy Dog Assisted Activities” was used to define the activities that took place. The term *therapy* is referring to the dogs, as these dogs are not only trained in therapeutic practices, but they are also being used in a therapeutic-like activity to help students relax and relieve stress while studying for final exams (Heath et al., 2013). The PAWS Therapy Dog Event received approval prior to its announcement from the Institutional Environmental Health, Safety, and Risk Management Office, which allowed for the Alkek Library to be exempted from the UPPS 04.05.10 *Animals on University Property* rule and was, therefore, performed in accordance of the rules and regulations of Texas State University.

Therapy Dogs in the Institutional Setting

Although the use of therapy dogs has become popular in both therapeutic and activity based practices, the use of incorporating therapy dogs in programs at the institutional level quickly has been gaining attention from institutions all across the country (Astorino et al., 2004). Although this method of stress management is new to the university and college environment, the social, psychological, physical and therapeutic benefits of human-animal interactions have been well documented in literature over the

course of time (Anderson, 2007; Evans & Gray, 2011; Shiloh, Sorek, & Terkel, 2003; Walsh, 2009). It is widely acknowledged within literature that the presence of a calm companion animal tends to reduce stress levels (Astorino et al., 2004; Bell, 2013), heart rates, and signs of anxiety (Allen, 2003; Matchock & Polheber, 2013; Shiloh et al., 2003; Walsh, 2009). Research also supports the hypothesis that the presence of an animal companion can also help boost individual's self-esteem and self-confidence (Anderson, 2007; Crosson & Foreman, 2012; Francis, 2009).

Although the majority of the published research was conducted in hospitals, therapy centers, and primary through secondary schools, the results can be applied to college students in the postsecondary environment (Bell, 2013). The use of therapy dog services and Therapy Dog Assisted Activities in a university or college environment may be a good fit, as students are susceptible to immense levels of stress (Dogar et al., 2012).

The college students' lifestyle provides students with transitions in nearly every aspect of daily living (Adamle, Carlson, & Riley, 2009). Students are responsible for adjusting to changes in their daily family attachments, establishing new daily living patterns, and they have to develop relationships and social connections. College students are also exposed to a great deal of stress as they strive for academic success (Bardi et al., 2011). Typically, college students' grades in their respected courses consist mostly of test and exam scores. The pressure for students to receive passing scores on these demanding test and exams can increase the amount of stress a student feels (Anderson & Cole, 1988). The use of therapy dogs on campuses may be able to help decrease the level of stress students experience during their time as a college student (C. Dochen, Personal communication, January 30, 2014).

Although there may be multiple ways that therapy dogs may be able to assist with students' daily lives while in college, this study was proposed to gain a better understanding of how students' perceived stress levels were impacted by participating in Therapy Dog Assisted Activities as they were studying for their final exams. In addition, the second purpose of this study was to examine how differently males' and females' stress levels changed in response to the Therapy Dog Assisted Activities and if interacting with the therapy dogs impacted one gender more than the other.

Chapter Summary

Chapter II presented the review of related literature, which found that academic stress stems from environmental constraints that involve important life and educational goals. The belief that one may not be able to successfully accomplish his or her goals is associated with negative affect, negatively impacting the level of stress one feels (Abella & Heslin, 1989; Bardi et al., 2011). For these reasons, students are susceptible to immense levels of stress during exam periods (Anderson & Cole, 1988; Manenica & Šimić, 2012). Although research has indicated that stress at an optimal level can be extremely beneficial for students as it stimulates students to perform at their best levels, if not properly monitored or regulated, students can experience negative impacts on their physical, mental, and emotional well-being (Anderson & Cole, 1988; Kavakli et al., 2012). These impacts can even have significantly different effects on males and females within the college setting (Brougham et al., 2009). The need for student support and stress management intervention has become a prevalent issue within institutions, which has resulted in some institutions implementing therapy dog programs in their schools during final exam times.

Although the social, psychological, physical and therapeutic benefits of human-

animal interactions have been well documented in literature over the course of time in a wide array of other settings and situations (Anderson, 2007; Evans & Gray, 2011; Shiloh, Sorek, & Terkel, 2003; Walsh, 2009), there is little research on how these practices impact college students during these stressful times. The use of therapy dog services and Therapy Dog Assisted Activities in a university or college environment may be a good fit within the college setting, as individuals are susceptible to immense levels of stress during their time as college student (Dogar et al., 2012).

Chapter III presents the methods and procedures that were used to best answer the research questions. The results from the pilot study, research design structure, and statistical analyses used are also presented in this chapter.

CHAPTER III

METHODS

Chapter III presents the research methods that were used in order to conduct this study. This chapter presents the research questions and the procedure used to best answer each research question. The results from the pilot study, which was the foundation for the development of this study, are presenting in this study. This chapter also describes the participants use in this study, the demographics of the participants, the setting the study took place in, the measures used to collect data with, and the statistical analyses used to analyze the data collected for each research question.

The purpose of this study was to examine the impacts TDAA had on students' perception of stress while studying for final exams and how these changes in stress levels compared to students who did not experience the TDAA. Due to the intense high levels of pressure for academic achievement (Anderson & Cole, 1988; Manenica & Šimić, 2012), many students are susceptible to immense levels of stress during final examination periods. For these reasons, this study was designed to survey two groups of students, a control and a TDAA group, across three different times to evaluate changes in their stress levels.

This study sought to answer two key questions: First, was there a significant difference between students' perceived stress levels across Time 1, Time 2, and Time3? Second, was there a significant difference between females' and males' perceived stress levels across Time 1, Time 2, and Time 3? To address these questions, an experimental design was used to survey the participants on their perceptions of stress levels across all

three time frames. Chapter III presents the methods that were used address the research questions as well as descriptive information about the participants.

Research Questions

The following research questions guided this study:

Research Question 1: Is there a significant difference between students' perceived stress levels across Time 1, Time 2, and Time3?

- a. Is there a significant difference in reported stress levels between the control and TDAA group at each time frame?
- b. Is there a significant difference in the changes of reported stress levels between time frames for both the control and the TDAA group?

Research Question 2: Is there a significant difference between females' and males' perceived stress levels across Time 1, Time 2, and Time 3?

- a. Is there a significant difference between females' and males' reported stress levels at each time frame for the control and TDAA group?
- b. Is there a significant difference in the changes of reported stress levels between time frames for males and female in both the control and the TDAA group?

Therapy Dog Program Pilot Evaluation

During the 2013 Spring final exams week, Texas State University's Alkek Library held their first AAA therapy dog pilot program called PAWsitive Energy (K. Hetherly, Personal Communication, April 25, 2013). The purpose of PAWsitive Energy was to "bring registered and insured therapy dogs, provided by Pet Partners of San Marcos, into Alkek Library... to help students relax while studying for final exams" (Heath et al., 2013). The PAWsitive Energy event took place in the Alkak library on the Texas State

University campus over the course of three days in the spring of 2013. The PAWsitive Energy event was protected through the Pet Partners CGLI insurance to protect both the students and the dogs. The therapy dog pilot project received approval prior to its announcement from the Institutional Environmental Health, Safety, and Risk Management Office, which allowed for the Alkek Library to be exempted from the UPPS 04.05.10 *Animals on University Property* rule and was, therefore, performed in accordance of the rules and regulations of Texas State University.

Students who attended the event were directed to the Leisure Reading Area in the back of the second floor in the Alkek Library. There, students were invited in to spend time with one of three therapy dogs and their handlers. Before leaving the Leisure Reading Area, participants were asked if they would volunteer participate in a short survey to discuss their overall experience. The questions used were solely developed to discover a foundational understanding of how student's exam-related stress fluctuated before, during, and after their interaction with the therapy dog. The responses were used to conduct a summative evaluation of the PAWsitive Energy event to learn its overall effectiveness to determine if the program should be continued or stopped.

Therapy Dog Program Pilot Evaluation Results

A total of 626 participants completed the survey over the course of the three days of the Therapy Dog Event. Participants consisted of freshmen (n=198, 33.5%), sophomores (n=153, 25.9%), juniors (n=144, 24.4%), seniors (n=96, 16.2%), and "other" which consisted of staff, guests, and faculty (n=35, 5.6%). There were almost five times as many females (n=395, 66.8%) than males (n=80, 13.5%) who participated in the event (gender unknown: n=116, 19.6%). Over the course of the three days, the second day was

the most popular day with the most recorded number of visits (day 2: $n=308$, 52.1%) compared to the other days (day 1: $n=155$, 26.2%, day 3: $n=128$, 21.7%). The finding from this study suggest that there was a significant change in the participants' stress levels between time and gender ($p<0.05$). As a result, a pairwise comparison was run on the interaction between gender and time suggesting that both females and males had a statistically significant decrease in stress levels ($p < 0.05$) from when they entered the event to when they actually participated with the dogs. Both female ($MD=2.066$, $p < 0.05$) and males ($MD= 1.808$, $p < 0.05$) had a significantly lower mean difference of stress level from before the event and after they left the event. Also, both females ($MD= -0.28$, $p < 0.05$) and males ($MD= -0.396$ $p < 0.05$) had a statistically significant increase in stress immediately after their interaction with the therapy dogs finished. These mean differences were higher for females compared to males, meaning that the effects of the therapy dog interaction may have had a stronger influence on the female participants.

Overall, the responses from the Texas State students were extremely positive and majority of the students reported that their interaction with the therapy dogs was a meaningful experience to them. The students sampled expressed their appreciation for the program with the therapy dogs, as they reported that they experienced a sense of relaxation while studying in the Alkek Library. These findings provided the researcher with insight of the possible impacts of the therapy dog interaction on the students' perceptions of stress and were used as the foundational framework for this study. These findings also set the parameters for the experimental methods that will be used during this study.

Although the data collected from this evaluation suggested that there was a

significant difference in the stress levels of the students who interacted the with therapy dogs over the course of time, the data did not meet the criteria for rigorous empirical research. For instance, the pilot study did not survey a control group of Texas State students who did not have any interaction with the therapy dogs. The changes in reported stress levels across the three time frames were only looked at from the intervention's perspective and did not include the control's perspective. To address this major limitation, this study was designed to compare the change in stress level not only across time, but also between the two groups: the control group who do not have any interaction with the therapy dogs and the TDAA group who will interact with the therapy dogs. This allowed the researcher to present how impacting the therapy dog interaction were on the students by having a better understanding of how stressed college student were when they were studying for final exams in general.

The current study was designed to provide college and student support programs with reliable and valid results on the impacts of therapy dog interactions on college students. Between what is known about academic stress and the promising influence of the TDAA in reducing students' stress, the findings from this study could potentially influence the practices higher institutions use help support their students during stressful periods of their academic careers.

Setting of Study

This study was conducted in the Student Learning Assistance Center (SLAC), located on the fourth floor of the Alkek Library at Texas State University in San Marcos, Texas. SLAC is a multi-faceted academic support center that provides tutoring services, Supplemental Instruction, learning and study skills workshops and learning specialist

consultants free of charge to students (Student Learning Assistant Center, n.d.). During the week of final exams, SLAC suspends all learning support activities and opens the floor to students to be used as a quiet studying environment. Additionally, SLAC allows the students to use all of their available resources, including their white boards, tables, computers, classrooms, and resources for the purpose of individual or group studying.

The SLAC center and the Alkek Library are open 24-hours a day during the week of final exams, which has resulted in students spending an extensive amount of time in the building to complete their studies. There have even been reports of students sleeping overnight in the center to study all night in the past. Based on these reports and informal observations by the director of SLAC, it has been inferred that it is possible that many of these students could be experiencing high levels of stress, anxiety, and other academic related emotions while prepping for their final exams (C. Dochen, Personal communication, January 30, 2014). Thus, this setting allowed for the researcher to survey students who were likely experiencing high levels of exam-related stress during their final examination week, compared to other locations on campus.

Participants

Data was collected from Texas State University undergraduate students (N=65) who attended the San Marcos campus during the 2014 spring semester. These participants voluntarily visited SLAC during final exams week. After agreeing to participate and signing a letter of consent (See Appendix A), participants reported their gender, self-report of current academic year (freshman, sophomore, junior, senior), and the classes they were studying for during their time in SLAC for descriptive purposes (See Appendix B). Descriptive statistics of the participants' genders and their respective

groups are presented in Table 1. The control group consisted of 28 participants; 13 (46.4%) were male and 15 (53.6%) were female. The TDAA group consisted of 37 participants who had interactions with the therapy dogs during this study; 11 (29.7%) were male and 26 (70.3%) were female. In total, 24 (36.9%) of the participants were male and 41 (63.1%) were female. The average age of the participants was 20.39-years-old.

Table 1

Gender Descriptive Statistics

	Control		TDAA		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Male	13	46.4%	11	29.7%	24	36.9%
Female	15	53.6%	26	70.3%	41	63.1%
Total	28	100%	37	100%	65	100%

Table 2 reports the participants' self-reported academic year, which is based on the number of college level credit hours students have completed and are currently enrolled in. Twenty (30.8%) participants identified themselves as freshman, 16 (24.6%) as sophomores, 18 (27.7%) as juniors, and 11 (16.9%) as seniors. Students were also asked to identify their ethnicity. Thirty-eight (58.5%) participants identified as white, 16 (24.6%) as Hispanic, 5 (7.7%) as Asian, 2 (3.1%) as Alaskan/Native American, 1 (1.5%) as Hawaiian, and 3 (4.6%) as multi-ethnic.

Table 2

Academic Class and Ethnicity Descriptive Statistics

Academic Class	<i>N</i>	Percentage %
Freshman	20	30.8%
Sophomore	16	24.6%
Junior	18	27.7%
Senior	11	16.9%

Table 2 Continued

Ethnicity	<i>N</i>	Percentage %
White	38	58.5%
Hispanic	16	24.6%
Asian	5	7.7%
Alaskan/ Native American	2	3.1%
Hawaiian	1	1.5%
Multi-ethnic	3	4.6%

Sampling Procedures

Participants were selected through convenience sampling techniques (Price, 2013) as students entered the Student Learning Assistance Center (SLAC) during final exam week to study. This mean that students were asked to participate in the study upon entering the SLAC and were given the option to not participate or leave the study at any time. All participants who completed the surveys were entered in for a raffle for a \$25 gift card to Wal-Mart. The raffle was conducted two days after the completion of the data collection process.

Measures

In this study, participants were asked to complete three short surveys that were distributed during Time 1, Time 2, and Time 3 of the study. These surveys were designed to gain a deeper understanding of the level of academic stress and anxiety the participants were experiencing during final examination week. At Time 1, participants responded to a questionnaire about learning and test related anxiety, demographic information, and self-reported stress levels. At Time 2 and Time 3, participants were only asked to report their current stress levels and write any additional comments about their experience in either the control group or the TDAA group.

Academic Emotions Questionnaire (AEQ)

Selected questions from the Academic Emotions Questionnaire (AEQ) were used to create the seven-item survey that used in this study (Goetz, Pekrun & Perry, 2005). For the purpose of this study, this data was not analyzed as the information provided from these questions were not relevant to the research questions.

Students' Self-Reported Stress Level (SSRSL)

Students were asked to report their current perceptions of their stress levels on a stress-level scale three times over the course of the study. This item has been compared across time (before, during, and after). Due to the lack of empirical research on students' self-reported stress levels while studying for final exams, the researcher developed the SSRSL scale to best answer the study's research questions. The SSRSL used an eleven point Likert scale from "not at all stressed" (0) to "extremely stressed" (10) and was incorporated in all of the surveys distributed during this study (See Appendix B-F). Students were also given the opportunity to reflect on their stress levels and experiences in the comment box at the end of their surveys.

Identification Information

Participants were asked to report their name on all three surveys used in this study. This information was confidential and has only been used by the researcher to identify the participants across all three surveys for organizational purposes. After successfully identifying the participant's three surveys, the researcher replaced all the names with a unique identifier before the data was analyzed. Data were kept secure by a fire-proof security storage container, in which only the researcher had access to the documents.

Divine Canines

The purpose of this study was to examine the impact of interaction with therapy dogs on students' perception of stress while studying for final exams and how these changes in stress levels compared to students who did interact with the dogs. The therapy dogs that were used in this study were provided by the Divine Canines organization, which is based in Austin, Texas. Divine Canines provided free animal-assisted therapy to SLAC. Currently, Divine Canines has approximately 80 dog-handler teams and serves hundreds of people on a regular basis (Divine Canines, n.d.). This includes working with children struggling with cognitive, developmental, or physical disabilities, working with children and adults who have a history of abuse or neglect, working with older adults who may be suffering from aging-related issues such as Alzheimer's or dementia, and working with wounded soldiers returning from war. For this study, Divine Canines provided the SLAC with two certified therapy dogs and their handlers for a PAWsitive Therapy Dog Event (Heath et al., 2013) two days during final exam week (in total, four therapy dogs were used in this study).

All of the Divine Canines and handlers are trained and evaluated before they begin interacting with their clients. Divine Canines' approach is to ensure that both the therapy dog and the handler feels confident in all situations. Before entering the training process, all dog handlers are required to earn an American Kennel Club Good Citizen Certification before entering the Divine Canines training program. This certification is awarded to canines and their owners who have successfully passed the 10-step Canine Good Citizen Program, meaning the canine can demonstrate good manners in the home and community and the owner demonstrates responsible pet ownership (American

Kennel Club, n.d.). Once certified, all Divine Canines teams are evaluated annually by an animal behaviorist and must show proof of good health from a veterinarian, and must be up-to-date on appropriate immunizations. To best match teams with the activities they will be involved with Divine Canines allow the teams to choose volunteer sites that align with their interests and dog's temperament. Lastly, Divine Canines provide liability insurance to their certified teams that covers teams when on approved site visits or attending approved events (Divine Canines, n.d.).

In order to provide the best service to their clients, Divine Canines trains all of their dogs and handlers with a positive and humane training philosophy (Divine Canines, n.d.). Divine Canines trains in complex environments with complex populations to best prepare the teams in any situation. By exposing the handler and dog to these complex scenarios, handlers are able to better judge the temperament of the dog when exposed to a difficult situation. For example, the dogs are exposed to the sights, smells, and sounds of the area they will be working before they interact with clients. This results in a well-rounded therapy dog that will be conditioned to a generalized skill set, meaning the dog will continue working regardless of the environment, situation, or distractions (Divine Canines, n.d.).

Procedure

The PAWsitive Therapy Dog Event (Heath et al., 2013) took place from Thursday, May 1st through Tuesday, May 6th during Texas State University's Spring 2014 final examination week. The study took place over the course of three different phrases, which are referred to as Time 1, Time 2 and Time 3. Time 1 refers to when students first entered SLAC and the same procedure was used for the intervention and the

control group. Time 2 Intervention refers to when the participants were engaged in the intervention and were surveyed while with the therapy dogs. Time 2 Control refers to when the participants were engaged with their studies and were surveyed without any exposure to the therapy dogs. Time 3 refers to when the participants were physically leaving SLAC and the procedures used for both the control and the TDAA group. The procedure was slightly adjusted for the control group to accommodate students who did not leave SLAC at the completion time of the study.

TDAA Group

Data collection from the Therapy Dog Assisted Activities (TDAA) group was collected on Monday, May 4th, 2014, from 1 pm to 3:30 pm while two therapy dogs were in SLAC. The SLAC faculty and volunteers had already rearranged the reserved classroom in SLAC for the therapy dogs and their trainers before their arrival to provide more space for the dogs, trainers, and participants. This included moving all of the tables and desks out into the main hallway and lining up the chairs along the side of the classroom wall to allow for additional setting for those who did not want to sit on the floor. Upon arriving to SLAC, the Divine Canine Teams were escorted to the room where the event would be taken place. At this time, the handlers allowed the dogs to spend some time alone in the room with them before any students were allowed in. This allowed the dogs to become more familiar with one another and their surroundings, to ensure that the dogs would not feel uncomfortable or stressed in their environment. Once the handlers felt their dogs were comfortable with their surroundings, they notified the researcher they were ready to see students. While the therapy dogs were present, there were between 4 to 20 students in the room at a time.

Time 1- TDAA Group

While the therapy dogs were present, 60 students were asked to participate in the study upon entering SLAC; the students were given a brief overview of the study, which included the procedure and the purpose for study. After agreeing to participate, the students signed a letter of consent (See Appendix A), and were asked to complete the first page of the survey (See Appendix B). After returning the letter of consent and survey to the researcher, the participant received two raffle tickets. These tickets were used to keep track of which students were participating in the study and how many surveys they had completed. Students were then instructed to give one of the tickets to the researcher's assistant who was present in the therapy dog room in order to receive the second survey.

Time 2 – TDAA Group

Time 2 began when the participants entered the therapy dog room. The participants were free to interact with the therapy dogs and participate in the TDAA for as long as they wanted. During their time with the dogs, the research assistant went around the room asking participants if they had their ticket and would like to complete the second portion of the survey (See Appendix C). In some cases, the participants approached the research assistant to exchange their tickets for the second part of the survey.

The interaction between the therapy dogs and the participants in this part of the study was not regulated or monitored. Since the therapy dogs were inside of a room with only one exit, the dogs were free to roam around off their leashes. Some of the participants sat on chairs located around the perimeter of the room and engaged in conversations with their peers or handlers; petting the dogs when the dogs walked passed

them. Others sat on the floor playing with the dogs. Throughout the day, handlers would demonstrate tricks the dogs know such as sitting, laying down, or barking on command. At times, participants would participate in the tricks showcase, and would give the dogs treats (provided by the trainer) as a positive reward for doing the tricks correctly. If the participant felt uneasy around a certain dog, the handlers would put a dog on the leash and allow the participant to interact with the dog while the dog was a little calmer to ensure that the participant did not feel threatened or unsafe around the dog.

Time 3- TDAA Group

Time 3 occurred when the participants were ready to leave SLAC. At this time, they were asked to return the third ticket to the researcher to receive the third and final portion of the survey (See Appendix D). To remind the participants to complete the third part of the study, they were asked submit their final ticket in to the researcher before leaving SLAC. Three neon green signs that read “Please return ticket #2 here” with arrows pointing towards the researcher’s station were placed by the exit of SLAC and by the library elevators.

At the conclusion of the therapy dog event, the SLAC faculty escorted the therapy dogs and their trainers to the exit of the library and proceeded to clean the classroom and set the room back up for classes later that day. The researcher compiled all the surveys that were collected and organized them alphabetically by student’s names. All of the raffle tickets were also compiled in one bag to be held for the end of the research study.

Control Group

Time 1- Control Group

Data collection from the control group was collected on Tuesday, May 5th, 2014,

from 11am to 1:30pm and again from 4:15pm to 7pm, while there were no therapy dogs present in SLAC. 60 students were asked to participate in the study upon entering SLAC; the students were given a brief overview of the study, which included the procedure and the purpose for study. After agreeing to participate, the students signed a letter of consent (See Appendix A), and were asked to complete the first page of the survey, which was an identical version of the first survey used for the TDAA group (See Appendix B). After returning the letter of consent and survey to the researcher, the participant received two raffle tickets and a blank half sheet of blue paper. The participants were asked to keep the blue sheet of paper on the desk where they were studying to make it easy for the researcher to identify them with raffle tickets.

Time 2- Control Group

While the students were in SLAC, the majority were working on their studies or assignments, the researcher quietly approached the participants and placed the second survey (See Appendix E) on top of their piece of blue paper for the student to fill out and took one of the raffle tickets. This was done to minimize the distractions the research could have caused on the participant. Once the participant completed the second survey, the researcher quietly picked up the surveys from the participant. Because there were few students in SLAC during this time, it was easy for the researcher to monitor the activity of the students while they were in SLAC and could easily identify the participants in the study and when they completed their portions of the survey.

Time 3- Control Group

When participants began to leave SLAC, they were reminded by the researcher to submit their final raffle ticket in before they left to complete the third and final portion of

the survey (See Appendix F). Three neon green signs that read “Please return ticket #2 here” with arrows pointing towards the researcher’s station were placed by the exit of SLAC and by the library elevators to also remind the participants to submit their final ticket in to the researcher before leaving SLAC.

At the conclusion of the data collection, the researcher compiled all the surveys that were collected and organized them alphabetically by student’s names. Once all of the surveys were identified, the researcher placed all of them in a 3 ring binder and was stored in a fire-proof, locked safety deposit box. The researcher removed all of the students’ names and replaced the sets of data with corresponding identification numbers. In total, there were 28 completed sets of data from the control group and 37 sets of complete sets of data from the TDAA group. Any incomplete data were not reported in this study and were archived. All of the completed data sets were then entered into an excel document and uploaded into SPSS for statistical analyzes.

Once all of the surveys had been collected, the researcher randomly selected one of the tickets from the bag of raffle tickets. The winner was contacted by the researcher and was awarded a \$25 gift card to Wal-Mart two days after the last day of the data collection.

Data Analysis

For this study, a repeated measures quasi-experimental design was used as the participants were not randomly assigned to groups (Pedhazur & Schmelkin, 1991). An experimental design was used with the level of stress that students reported as the dependent variable and the interaction with the therapy dogs as the independent variable.

Statistical Analysis

IBM SPSS Statistics 22.0 was used for statistical analysis. To answer Research Question 1, a repeated measures analysis of variance (ANOVA) was conducted to compare the means of the Group x Time interaction (Stevens, 2007). To answer Research Question 2, a three-way repeated measures ANOVA was run to compare Group x Time x Gender relationship. Within-subject contrasts were used to first identify significant interactions between the independent variables (males and females). Post Hoc tests were then run on these significant interactions to better understand the relationship of the interaction terms using Bonferroni adjustments to reduce the inflation of Type 1 Error in this study.

Chapter Summary

Chapter III presented the research methods that were used in order to conduct this study. The purpose of this study was to examine the impacts TDAA had on students' perception of stress while studying for final exams and how these changes in stress levels differed between males and females. This study sought to answer two key questions: First, was there a significant difference between students' perceived stress levels across Time 1, Time 2, and Time3? Second, was there a significant difference between females' and males' perceived stress levels across Time 1, Time 2, and Time 3? Chapter III also presented the findings from the Therapy Dog Pilot Evaluation, where results of the evaluation were found to be promising, however were not credible. Ultimately, these results were used as the foundation to the development of this study. Unlike the pilot evaluation, this study used a formal experimental design. This formal designed incorporated the use of certified therapy dogs and their handlers from Divine

Canines and took place in SLAC during the week of final exams at Texas State University. The procedure used is clearly explained in Chapter III. Chapter IV presents the analysis of the data that was collected during this study.

CHAPTER IV

RESULTS

The following chapter presents the statistical analysis of this study and presents the results for each research question. It identifies where interaction terms in this study had significant results and what the differences in mean of reported stress levels for each group and time frame in this study. Chapter IV presents figures, which visually show the changes in mean differences in a graph format as well as a brief description of what each figure represents.

The purpose of this study was to examine how interaction with therapy dogs impacted students' perception of stress while studying for final exams and how these changes in stress levels compared between males and females. This study sought to answer two key questions: First, was there a significant difference between students' perceived stress levels across Time 1, Time 2, and Time3? Second, was there a significant difference between females' and males' perceived stress levels across Time 1, Time 2, and Time 3?

To address these questions, participants from the control and TDAA group completed surveys that measured the participants' perception of stress over the course of three time frames (these time frames have been identified as Time 1, Time 2, and Time 3). The activities the participants engaged in for this study in differed for the control and the TDAA group. At Time 1, the participants of both the control group and the TDAA group were surveyed upon entering the Student Learning Assistance Center (SLAC). At Time 2, the control group was surveyed while they were engaged in their studies at the

SLAC studies, whereas the TDAA group was in SLAC while the therapy dogs were present. At Time 3, both the participants of the control group and the TDAA group were surveyed as they were leaving SLAC. In this chapter, the results of the statistical analysis performed on the data collected is presented.

Findings

Research Question 1: Is there a significant difference between students' perceived stress levels across Time 1, Time 2, and Time3?

- a. Is there a significant difference in reported stress levels between the control and the TDAA group at each time frame?
- b. Is there a significant difference in the changes of reported stress levels between time frames for both the control and the TDAA group?

To answer Research Question 1, a repeated measures ANOVA was run to compare the means of the Group x Time interaction. A pair-wise comparison was run to identify significant interactions. The results of the ANOVA reported a statistically significant Group x Time interaction on the participants reported stress levels, $F(1.847, 112.657) = 36.029$, $p < .001$, $\eta_p^2 = .371$. There was a medium effect size that explained 37.1% of the variation reported in the change in stress levels was explained by the Group x Time interaction (Stevens, 2007).

Table 3 presents the findings of the pairwise comparison for the Group x Time interactions. The post hoc tests performed suggested that the mean difference of the Group x Time interaction at Time 1 was not significant ($p > .05$). The mean stress levels at Time 2 were reported to be significant ($M = 2.696$, $p < .001$, $SE = .614$, $d = .362$), and the mean stress levels for Time 3 were also reported to be significant ($M = 3.027$, $p < .001$,

SE= .616, $d= .089$).

Table 3

Pairwise Comparison of Mean Stress Levels Between Groups During Each Time Frame

Time	Group (I)	Group (J)	Mean Difference (I-J)	Std. Error	Sig.**
1	Control	TDAA	-.530	.524	.316
2	Control	TDAA	2.696*	.614	.000
3	Control	TDAA	3.027*	.616	.000

Based on estimated marginal means

*The mean difference is significant

**Adjustment for multiple comparisons: Bonferroni

Table 4 presents the mean stress levels and the standard deviation for the Group x Time interaction. Figure 1 plots these means on a plot graph and showcases the changes in mean stress levels across time for each group. The mean difference between the control and TDAA group at Time 1 were not found to be significant. At Time 2, there was a significant difference in reported stress levels between the control (M=6.607, SD= 2.409) and TDAA group (M= 3.973, SD= 2.291). At Time 3, there was a significant difference in reported stress levels between the control (M= 6.339, SD= 2.756) and the TDAA group (M= 3.324, SD= 2.187).

Table 4

Descriptive Statistics for Mean Stress Levels for Group x Time Interaction

	<u>Time 1</u>		<u>Time 2</u>		<u>Time 3</u>	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Control	5.500	1.732	6.607	2.409	6.339	2.756
TDAA	6.216	2.188	3.973	2.291	3.324	2.187

Note. Control (n= 28) and TDAA (n=37). A 11-point scale was used for self-report measure.

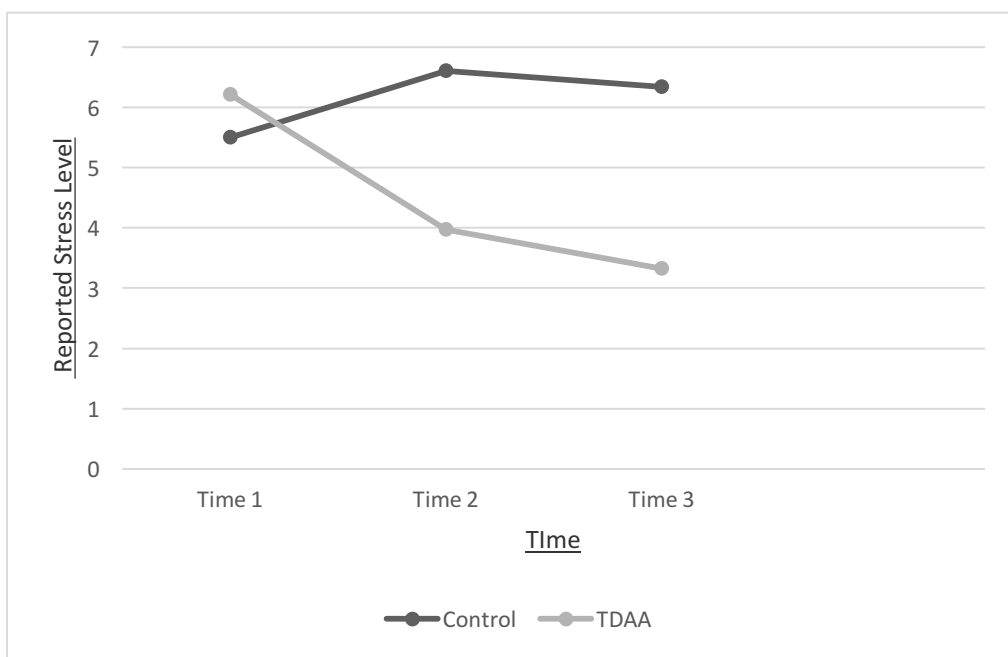


Figure 1. Reported mean stress levels for group x time interaction. A statistical significant Group x Time interaction on reported mean stress levels is shown ($p < .001$). There were no significant differences found for the control group. The TDAA group reported a significant decrease in stress levels from Time 1-Time 2 and Time 1- Time 3. At Time 1, the mean difference between the control group and the TDAA were not significant. At Time 2 and Time 3, the mean difference between the control group and the TDAA group were significant. Control ($n = 28$) and TDAA ($n = 37$). A 11-point scale was used for self-report measure.

Table 5 presents the mean difference of the Group x Time interaction by time frames. The results of the two-way interaction reported that there was a significant difference in the control group's perceived stress levels from Time 1 - Time 2 ($M = -1.079$, $p < .001$, $SE = .293$). The reported changes in stress levels from Time 2 – Time 3 and Time 1- Time 3 were found to be not significant for the control group. The TDAA group however reported a significant decrease in stress levels from Time 1- Time 2 ($M = 2.147$, $p < .001$, $SE = .278$) and Time 1- Time 3 ($M = 2.792$, $p < .001$, $SE = .357$). These changes in stress levels are also presented in Figure 1, which presents as visual of the increase of stress levels for the control group and the decrease in stress.

Table 5

Pairwise Comparison of Mean Stress Levels Within the Group x Time Interaction

Group	(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig.**
Control	1	2	-1.079*	.293	.001
		3	-.765	.333	.075
	2	1	1.079*	.293	.001
		3	.314	.377	1.000
	3	1	.765	.333	.075
		2	-.314	.377	1.000
TDAA	1	2	2.147*	.278	.000
		3	2.792*	.316	.000
	2	1	-2.147*	.278	.000
		3	.645	.357	.228
	3	1	-2.792*	.316	.000
		2	-.645	.357	.228

Based on estimated marginal means

*The mean difference is significant

**Adjustment for multiple comparisons: Bonferroni

Research Question 2: Is there a significant difference between females' and males' perceived stress levels across Time 1, Time 2, and Time 3?

- a. Is there a significant difference between females' and males' reported stress levels at each time frame for the control and the TDAA group?
- b. Is there a significant difference in the changes of reported stress levels between time frames for males and female in both the control and the TDAA group?

To analyze these questions, a three-way repeated measures ANOVA was run to compare the means of the Group x Time x Gender interactions. Within-subject contrasts were used to first identify significant interactions between the independent variables (males and females). Post Hoc tests were then run on these significant interactions to

better understand the relationship of the interaction terms using Bonferroni adjustments to reduce the inflation of Type 1 Error in this study.

Tables 8 and 9 presents the results of the ANOVA which, report a statistically significant Group x Time x Gender interaction on the participants reported stress levels, $F(1.847, 112.657) = 3.828, p < .001, \eta_p^2 = .059$. The effect size of this result was small with 5.9% of the variation reported in the change in stress levels explained by the Group x Time x Gender interaction (Stevens, 2007).

Table 6 presents the pairwise comparisons over the Group x Time x Gender interaction. These post hoc tests suggest that the mean difference of the Group x Time interaction at Time 1 was significant for both males and female participants. For males, there was a significant difference in means between the control and TDAA group at Time 2 ($M = 2.441, p < .05, SE = .963$), and Time 3 ($M = 2.115, p < .05, SE = .966$). For females, there was a significant difference in means between the control and TDAA group at Time 2 ($M = 2.951, p < .001, SE = .762$), and Time 3 ($M = 3.938, p < .001, SE = .765$).

Table 6

Pairwise Comparison of Stress Levels Within the Group x Time Interaction for Males and Females

<u>Gender</u>	<u>Time</u>	<u>Group (I)</u>	<u>Group (J)</u>	<u>Mean Difference (I- J)</u>	<u>Std. Error</u>	<u>Sig.**</u>
Males	1	Control	TDAA	-.161	.823	.846
	2	Control	TDAA	2.441*	.963	.014
	3	Control	TDAA	2.115*	.966	.032
Females	1	Control	TDAA	-.900	.651	.172
	2	Control	TDAA	2.951*	.762	.000
	3	Control	TDAA	3.938*	.765	.000

Based on estimated marginal means

*The mean difference is significant

**Adjustment for multiple comparisons: Bonferroni

Table 7 presents the means and the standard deviation for the Group x Time interaction. The mean difference between the control and TDAA group at Time 1 was not found to be significant. At Time 2, there were significant differences in males' stress levels for both the control group (M= 6.077, SD= 2.431), and the TDAA group (M= 3.636, SD= 2.785). There was also a significant difference in females' stress levels at Time 2 for both the control (M=7.067, SD= 2.375) and the TDAA group (M= 4.115, SD= 2.286). At Time 3, there was a significant difference in males' stress levels for both the control group (M=5.115, SD= 2.785), and the TDAA group (M= 3.00, SD= 2.145). There was also a significant difference in females' stress levels at Time 3 for both the control (M= 7.400, SD= 2.324) and the TDAA group (M= 3.462, SD= 2.231). Figure 2 plots these means on a graph to showcase the change in mean stress levels across time for both males and females in either the control or TDAA group.

Table 7

Descriptive Statistics of Mean Stress Levels for the Time x Group x Gender Interaction

		<u>Time 1</u>		<u>Time 2</u>		<u>Time 3</u>	
		Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Male	Control	5.385	2.022	6.077	2.431	5.115	2.785
	TDAA	5.545	2.252	3.636	2.378	3.000	2.145
Female	Control	5.600	1.5024	7.067	2.375	7.400	2.324
	TDAA	6.500	2.1401	4.115	2.286	3.462	2.231

Note. Control (n= 28) and TDAA (n=37). A 11-point scale was used for self-report measure.

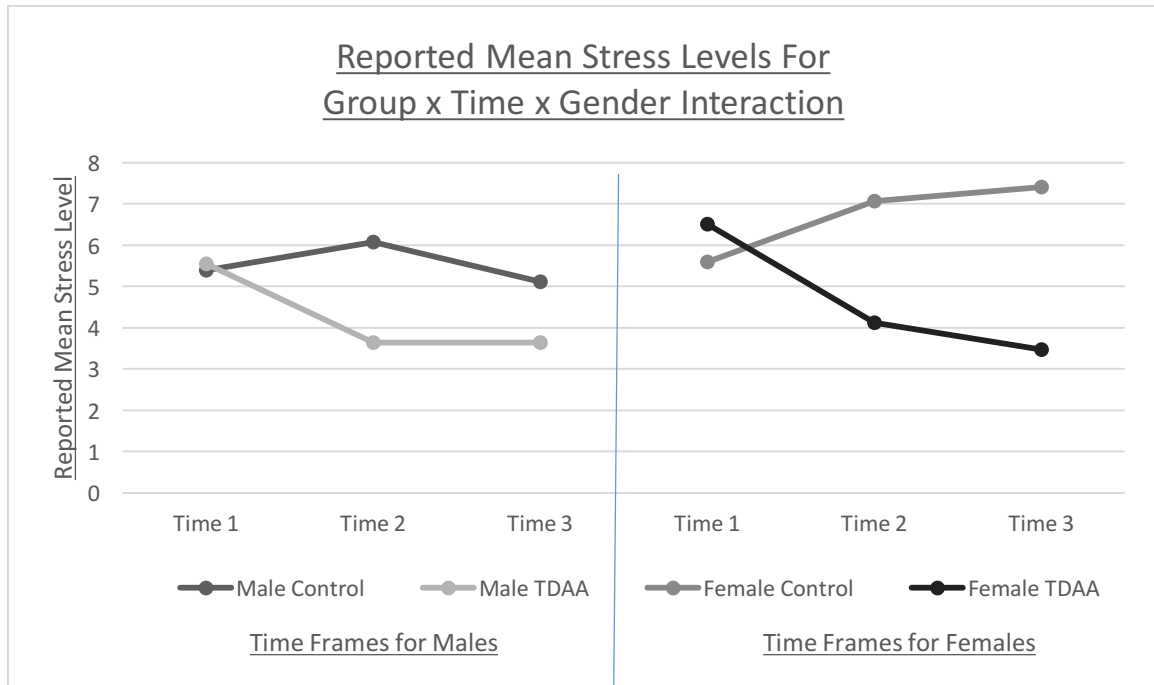


Figure 2. Reported mean stress levels for group x time x gender interaction. A statistically significant time x group x gender interaction is shown ($p < .005$). Mean differences in stress levels for the male control group were not significant. Males in the TDAA group reported a significant decrease in mean stress levels from Time 1-Time 2 and Time 1-Time 3. Females in the control group reported a significant increase in mean stress levels from Time 1-Time 2 and Time 1-Time 3. Females in the TDAA group reported a significant decrease in mean stress levels from Time 1-Time 2 and Time 1-Time 3. The mean differences between the control group and the TDAA group were not significant at Time 1. There was a statistically significant difference in means at Time 2 and Time 3 for both males and females. Control ($n = 28$) and TDAA ($n = 37$). A 11-point scale was used for self-report measure.

Table 8 presents the results of the repeated measures ANOVA for the Group x Time x Gender interaction. For males in the control group, there were no significant differences in means during any of the time frames. However, there was a significant decrease in reported stress levels for the male TDAA group between Time 1-Time 2 ($M = 1.909$, $p < .001$, $SE = .466$) and between Time 1-Time 3 ($M = 2.545$, $p < .001$, $SE = .530$). The results for female participants in the control group reported a significant difference in reported stress levels between Time 1-Time 2 ($M = -1.467$, $p < .002$, $SE = .339$), and Time 1-Time 3 ($M = -1.800$, $p < .001$, $SE = .454$). These significant mean differences were negative, showcasing a significant increase in stress levels across those time periods. In comparison, the females in the TDAA group reported a significant

decrease in stress levels from Time 1-Time 2 ($M=2.285$, $p<.001$, $SE=.303$), and Time 1-Time 3 ($M=3.038$, $p<.001$, $SE=.345$).

Table 8

Pairwise Comparison of Mean Stress Levels for the Time x Group x Gender Interaction

Gender	Group	(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig.**
Male	Control	1	2	-.692	.428	.334
			3	.269	.487	1.000
		2	1	.692	.428	.334
			3	.962	.551	.258
		3	1	-.269	.487	1.000
			2	-.962	.551	.258
	TDAA	1	2	1.909*	.466	.000
			3	2.545*	.530	.000
		2	1	-1.909*	.466	.000
			3	.636	.599	.877
		3	1	-2.545*	.530	.000
			2	-.636	.599	.877
Female	Control	1	2	-1.467*	.339	.002
			3	-1.800*	.454	.001
		2	1	1.467*	.399	.002
			3	-.333	.513	1.000
		3	1	1.800*	.454	.001
			2	.333	.513	1.000
	TDAA	1	2	2.385*	.303	.000
			3	3.038*	.345	.000
		2	1	-2.385*	.303	.000
			3	.654	.390	.296
		3	1	-3.038*	.345	.000
			2	-.654	.390	.296

Based on estimated marginal means

*The mean difference at the

**Adjustment for multiple comparisons: Bonferroni

Chapter Summary

Chapter IV presented the statistical analysis of this study and presented the results for each research question. Since there were significant findings in the results,

Chapter IV identifies where these significant interactions take place and how different the mean stress levels were between each variable(s). Chapter V presents the discussion of these findings.

CHAPTER V

DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

Chapter V presents a brief summary of the purpose and procedures of this study. This chapter also presents a discussion of the findings from this study, which is followed by a discussion of the study's limitations of this study and how similar programs, like the one used in this study, can be implemented in other programs or institutions. Lastly, this chapter presents a discussion for future research, which would better help address the hypothesis of this study.

Summary of Purpose

The purpose of this study was to investigate the impacts therapy dog interactions had on undergraduate college students' perceived stress level while they were studying for final exams. This study was designed to provide empirical research to examine the hypothesis that students who participated in the Therapy Dog Assisted Activities (TDAA) while studying for final exams would experience a significant decrease in perceived stress levels compared to their counterparts who do not have any interaction with the therapy dogs. To best support this hypothesis, the following research questions were asked: First, was there a significant difference between students' perceived stress levels across Time 1, Time 2, and Time3? Second, was there a significant difference between females' and males' perceived stress levels across Time 1, Time 2, and Time 3?

Research has suggested that the psychological stress that college students experience is often associated with pressure for academic achievement, which can peak during tests and exam periods (Bardi et al., 2011). Academic stress differs from general stress as it stems from environmental constraints that involve important life and

educational goals (e.g., completing course requirements, or doing well on an exam). The belief that if students might not be able to successfully accomplish their academic related goal can present academic stress, and if not managed correctly, then they may experience negative changes in their overall wellbeing (Abella & Heslin, 1989; Bardi et al., 2011). Students are susceptible to immense levels of stress during the end of an academic semester final exam week because of this fear of failure (Anderson & Cole, 1988; Manenica & Šimić, 2012).

Stress among college students has been a prevalent issue for a variety of students, and some students experience the effects more severely than others. There are also notable differences in how individuals cope with these types of stress. Research has indicated that there are significant differences in how males and females cope with and experience stress (Brougham, Mendoza, Miller, & Zail, 2009). Females tend to experience stress, anxiety, and depression more often and more intensely than their male counterparts (Carpenter et al., 2008), because they tend to be more emotionally involved with their stressors. In this study, it was hypothesized that there would be a significant difference in reported stress levels between male and female participants, because the genders experience stress differently. This study adds to the body of knowledge on gendered reactions to stress by the impacts of TGAA by gender.

With the impacts of rising stress levels in students becoming a prevalent issue within institutions, one method that has been quickly gaining the attention of faculty and students is the use of trained therapy dogs in postsecondary educational settings (Astorino et al., 2004). Although this method of stress management is new to the university and college environment, the social, psychological, physical and therapeutic benefits of

human-animal interactions have been well documented in literature (Anderson, 2007; Evans & Gary, 2011; Shiloh et al., 2003; Walsh, 2009). Empirical research supports the hypothesis that just the presence of a calm companion animal tends to reduce stress levels (Astorino et al., 2004; Bell, 2013), heart rates, and signs of anxiety (Allen, 2003; Shiloh et al., 2003; Walsh, 2009). There is also literature that supports the hypothesis that the presence of an animal companion can also help boost individuals' self-esteem and self-confidence (Anderson, 2007; Crosson & Foreman, 2012; Francis, 2009).

The use of therapy dogs on postsecondary campuses may be able to help lower the level of stress that students experience during their time as college students (C. Dochen, Personal communication, January 30, 2014). This study attempted to best identify the effectiveness and overall impact of TDAA on students' perceived stress levels during final exam week.

Summary of Procedure

Data was collected from Texas State University undergraduate students (N=65) visited the Student Learning Assistance Center (SLAC) during final exam week. Students who volunteered to participate were asked to complete three short surveys that were distributed during Time 1, Time 2, and Time 3 of the study. These surveys were designed to gain a deeper understanding of the level of academic stress the participants were experiencing during final examination week. Due to the lack of empirical research on students' self-reported stress levels while studying for final exams, the researcher developed the SSRSL scale to best answer the study's research questions. The SSRSL used an eleven point Likert scale from "not at all stressed" (0) to "extremely stressed" (10) (See Appendix B). To answer Research Question 1, a repeated measures Analysis of

Variance (ANOVA) was computed to compare the means of the Group x Time interaction (Stevens, 2007). To answer Research Question 2, a three-way repeated measures ANOVA was run to compare Group x Time x Gender relationship. Within-subject contrasts were used to identify significant interactions between the independent variables (males and females).

Discussion of Findings

The discussion of the results of this study are organized by each research question. For the following discussion, the p-value for significant interactions is reported to be less than 0.005.

Research Question 1

Is there a significant difference between students' perceived stress levels across Time 1, Time 2, and Time 3?

- a. Is there a significant difference in reported stress levels between the control and the TDAA group at each time frame?
- b. Is there a significant difference in the changes of reported stress levels between time frames for both the control and the TDAA group?

Time 1

The analysis indicated that there was not a significant difference in participants' stress levels between the control group and the TDAA group at Time 1. These findings suggests that the participants were experiencing similar perceptions of stress levels when they entered SLAC , which were reported to be moderate (M=5.86). Since the students who participated in this study were in middle of final exam week, it is possible that the cause of this moderate stress level was related to academic stressors (Kavakli et al.,

2012). It is unknown, however, if this was the only stressor students were experiencing. Further research needs to be conducted to determine what additional stressors students experience during the time of final exams, such as social constraints, outside of school factors, or students' overall emotional and mental well-being.

Time 2

At Time 2, there was a significant difference in the reported stress levels between the control group and the TDAA group. Students in the control group reported having a moderately high stress level while studying ($M=6.607$) and the students who participated in the TDAA group reported having a moderately low stress level ($M=3.973$). These findings indicate that the students who were interacting with therapy dogs during their time studying in SLAC experienced significantly lower levels of stress than their peers who did not participate in the therapy dog activities.

Both groups of participants reported experiencing significant change in stress levels from Time 1 to Time 2. Participants in the control group reported a significant increase in their stress levels from the time they entered SLAC to the time they were surveyed while they were studying. The participants who participated in the TDAA group reported a significant decrease in stress levels from the time they entered SLAC to the time they were surveyed with the dogs. Therefore, the results suggest that the TDAA played a significant role in helping students reduce the levels of stress they perceived to be experiencing. These findings add to the literature by showing the impact of therapy dog assisted activities on perceived stress levels during intense time periods.

Time 3

At Time 3, all students reported their final stress level upon leaving SLAC. The

students in the control group reported having a moderately high stress level ($M=6.339$) upon leaving the center. Because the difference in reported stress levels between Time 2 and Time 3 were not significant for the control group, the students experienced similar stress levels as they were leaving SLAC compared to when they were actually studying. These findings indicate that the students who were in the control group experienced a significant increase in stress levels from when they first entered SLAC to begin studying for their final exams to when they finished their studying and when they left SLAC. These findings are also consistent with the Bardi et al. (2011) findings where they found that students experienced a significant peak in their stress levels while they were in examination periods in their academic semesters and that they were susceptible to immense levels of continuous stress during these time periods.

After interacting with the therapy dogs during Time 2, the students in the TDAA group did not report any significant differences in stress levels once they left SLAC at Time 3. These findings suggest that participants who interacted with the therapy dogs displayed a significant decrease in stress levels upon first meeting the dogs and then continued to experience lower stress levels when they left the center at Time 3. These results are consistent with the findings from the literature review where multiple sources reported that when in the presence of a calm companion animal, such as therapy dogs, individuals are likely to experience a decrease in stress levels (Astorino et al., 2004; Bell, 2013). Ultimately, the mean difference in stress levels reported by the control group and TDAA group at Time 3 were significantly different, with the TGAA group reporting significantly lower stress levels after studying compared to the participants who did not participate in TDAA group.

Research Question 2

Is there a significant difference between females' and males' perceived stress levels across Time 1, Time 2, and Time 3?

- a. Is there a significant difference between females' and males' reported stress levels at each time frame for the control and the TDAA group?
- b. Is there a significant difference in the changes of reported stress levels between time frames for males and female in both the control and the TDAA group?

Time 1

The analysis indicated that, for both genders, there was no significant difference in participants' stress levels between the control group and the TDAA group at Time 1. This indicates that all of the males and females who participated in the study entered SLAC experiencing similar moderate stress levels ($M=5.65$). Because this research question investigated how the TGAA impacted the male and female participants differently, it was important that this baseline number was similar and not significantly different, as this baseline indicated that all students arrived at SLAC with similar stress levels. Any changes in perceived stress were compared to this base number, as it provided this study with a reliable "before" mean stress level which was used to compare how both genders' stress levels changed at Time 2 and Time 3.

Time 2

At Time 2, a significant difference in stress levels between the control and the TDAA group was reported by both males and females when compared to Time 1. Male participants who interacted with the therapy dogs reported experiencing a significantly lower stress level during their time in SLAC ($M=3.636$), compared to the male

participants who attended to their studies in SLAC when the dogs were absent ($M=6.077$). The drop of the TDAA group's stress levels from the time they first entered SLAC (Time 1) to when they were with the therapy dogs (Time 2), was reported to be significant. It can be concluded that the therapy dogs played a significant role in helping males lower their stress levels while they were preparing for their final exams. This however was not found to be true for the control group. The members of the male control group did not experience any changes in their stress levels while they were studying in SLAC at Time 2.

The female participants reported similar results, where females who interacted with the therapy dogs reported a significantly lower stress level ($M=4.115$) compared to the females who did not interact with the dogs ($M=7.067$). As females entered SLAC (Time 1) and began interacting with the therapy dogs (Time 2), they, like their male counterparts, reported a significant drop in stress levels. Females who did not participate in the TDAA however reported the opposite effect. From the time they entered SLAC to the time they began studying, they reported a significant increase in stress levels. This may be because females are more affected by stressors compared to males, as they tend to be more emotionally involved with the stressor (Matud, 2004). These findings suggest that the therapy dog program played a significant role in lowering females' stress levels when presented with stressors.

Although the therapy dogs did significantly lower the levels of stress that females were experiencing while in SLAC, the overall stress levels that females reported during Time 2 were still significantly higher than their male counterparts. This also holds true for females who did not interact with the therapy dogs, as they too reported higher stress

levels and the males who were also in the control group. This is consistent with the findings of numerous studies which reported that females tend to experience stress more intensely than males, regardless of the situation they are placed in (Brougham et al., 2009; Carpenter et al., 2008; Dodge et al., 1994; Matud, 2004). This research adds to literature by documenting that even though all participants benefited from interacting with the therapy dogs, female participants benefited more than their male counterparts from the therapy dog assisted activities.

Time 3

At Time 3, the results indicated similar patterns as those found at Time 2. As male participants were leaving SLAC, those who had interacted with the therapy dogs reported having lower levels of stress ($M=3.000$) compared to those who did not ($M=5.115$). The female participants who interacted with the therapy dogs also reported experiencing lower stress levels as they were leaving SLAC ($M=3.452$) compared to the female participants who did not interact with the therapy dogs ($M=7.400$). As described in the findings for Time 2, female participants in both the control and TDAA group continued to report higher stress levels to males for Time 3.

The analysis indicated that the change in stress levels from Time 2 to Time 3 for both the groups (control and TDAA) and both genders (males and females), were not significant. This result indicates that when participants exited SLAC, they were still experiencing similar stress levels as when they were either studying with the therapy dogs present or when the therapy dogs were absent. Significant changes in reported stress levels were identified from the time participants entered SLAC (Time 1) to the time they left SLAC (Time 3).

First, the male participants in the control group were the only group to not report any significant changes in stress levels from the time they entered SLAC, studied for their exams, and then left SLAC. This lack of change is consistent with the findings of Matud's (2004) study where he found that males are more capable of controlling the amount of stress they feel because they tend to use more active coping behaviors, which in the case of this study, includes the active act of studying. Although the males in the TDAA group reported having a moderate stress level upon entering SLAC, they left feeling almost no stress at all after interacting with the therapy dogs. This result indicates that males can benefit from interacting with therapy dogs, even though they may be more likely to already have control of the amount of stress they feel.

Second, the results indicated that females who participated in the control group did experience a significant change in stress levels over the course of this study. Females in the control group reported having a significant increase in stress levels from the time they entered SLAC to the time they left the center. Once these female participants experienced the spike in stress levels, they continued to experience higher than average stress levels, even after they were no longer studying.

The analysis of the female TDAA group displayed different results. Even though the females in the TDAA group entered SLAC experiencing a moderate level of stress, they reported experiencing almost no stress at all while interacting with the therapy dogs. Even after these females left the therapy dogs and proceeded to leave SLAC, their stress levels continued to drop.

Conclusions

Overall, the results of this study found that the therapy dog program was successfully able to lower the level of stress for both male and female participants were experiencing while they were studying for final exams. The analysis reported that the TDAA played a stronger and more significant role helping females reduce their stress levels than for males. This is important for faculty members working in institutions to recognize since females are more susceptible to experiencing stress and other stress related side-effects than males in general (Carpenter et al., 2008). Regardless of gender, however, the interaction with therapy dogs did help participants lower their overall perception of stress, which supports the overall hypothesis of this study.

This study supports the use of TDAA during final exams. The results of this study suggested that the use of a TDAA is a promising way for institutions to better help students better manage their stress levels during final exam periods. These results add to literature by demonstrating how the use of a TDAA within an institution can better enhance the over all experience of studying final exams by providing students with an activity that promotes stress management and overall wellness. It also indicates that although males and females experience academic-related stress differently during the final exam period, TDAA or other similar therapy dog programs can better help female students control their stress levels.

Futhermore, it is unknown whether the effects of the interaction with the therapy dogs was the primary reason why the participants of this study experienced the drop in perceived stress levels. Further research is needed to investigate if students truly experienced a reduction of stress because of the TDAA, or if it was because they were

taking a “break” from their studies. Because the therapy dog activities were not monitored or individualized, students were also given the opportunity to interact with their peers and the therapy dog handlers. It is also unclear if just talking to another individual and spending time with other students in a non-academic related atmosphere was also a contributing factor to the reduction of stress students experienced. Future research is needed to better explain the changes in stress levels students experience in these settings.

Limitations

Due to the nature of this study, a few limitations did exist. One limitation included the availability of the therapy dogs during the study. Due to the constraints of the Texas State University Campus final exam schedules and the UPPS 04.05.10 *Animals on University Property* rule, the times the therapy dogs were available in SLAC were limited. The effects of the therapy dogs could have been different had the dogs been available during the peak hours of final exam week. Additionally, due to some unforeseen emergency circumstances, the researcher was only able to collect data toward the end of final week for the Spring 2014 academic semester. Due to this limitation of the timing of this study, the results could have been impacted.

Another limitation of this study was the use of self-reported data. In the field of social sciences, the validity of self-reported data has been studied extensively, as it is one of the most common question items in studies that use self-reported studies (Brender, Billy, & Grady, 2003). Two of the major risks of using self-reported is participants may not always be honest in reporting their responses or they may not understand what they are being asked of and how to best answer the questions (Barker, Elliot, & Pishtrang,

2002). However, self-report data was the most practice use for collecting data as it provided data on the participants' own views and feelings directly. Future studies may want to conduct this study using either re-test methods or biochemical tests to test for levels of stress hormones to increase their validity (Brender et al., 2003).

Additionally, this study did not look at the influences of how taking a “break” from studying without therapy dogs could impact one's stress levels. Although participating with the therapy dogs in this study was ultimately a type of study break for the students, there was no data collected on how differently students responded to the therapy dog break compared to a traditional study break. Future research will be able to address this difference and investigate if the therapy dog assisted activities played a more significant role in helping students lower the level of stress they were experiencing compared to similar study breaks.

Lastly, there were twice as many female participants in this study compared to males. Although the therapy dogs played a significant role in helping both genders decrease the amount of stress they reported experiencing, females tend to be more emotionally involved with their stressors, making them prone to experiencing high levels of stress in stressful situations (Matud, 2004). Therefore, females may be more likely to benefit from TDAA focused on managing their stressors compared to males.

Implications

Educators, therapists, and researchers have approached AAA and AAT with the notion that these types of activities and therapies will help individuals lower the level of stress they perceive to be experiencing in high stress situations. This study sought to determine if the interactions with trained therapy dogs helped students decrease the

amount of stress they were experiencing while they were studying for their final exams. According to the results of this study, the students who interacted with the therapy dogs not only reported a significant decrease in the amount of stress they were experiencing while preparing for their final exams, but they also reported having much lower stress levels than the control group. This is great news for educators, institutions, counseling centers, libraries, and researchers looking for a high-impact, low cost way to better support their students' and clients' during stressful events. Since the use of most therapy dog programs are run by non-for profit organizations and do not cost a lot of money (in this study, the use of the therapy dogs was free to the institution), institutions will be able to afford to implement similar programs in their schools. It also is a program that researchers can use when looking for a budget friendly program to include in their research efforts.

In educational settings, there are a handful of situations where students experience higher than normal stress levels (Lust et al., 2010). Institutions can benefit from this study as it supports the theory that activities involving therapy dogs can have positive benefits for students who report experiencing higher than normal stress levels. Based on the results of this study, bringing therapy dogs onto campuses aided students from feelings over whelmed or overly stressed during final exam week. By implementing a therapy dog program, similar to the one used in this study, during finals week on other campus, other institutions can provide additional and beneficial emotional support services to their students. It also allows for students to seek the comfort of the dogs on their own time without the hassle of making an appointment.

Counseling centers can also benefit from the findings of this study. Today's

students choose not to seek professional counseling help when they experience intense levels of stress (Eisenberg et al., 2007). By hosting a therapy dog event in their center, they can bring students into the center to experience a fun and safe break from studying, while also educating students on additional services they can provide. Also, counseling centers could consider keeping a therapy dog on campus year round, to use when students or faculty may need the additional assistance in stress management throughout the academic year.

Recommendations for Future Research

The results of this study suggest that there are several avenues for additional research. First, research needs to be conducted to determine what additional stressors students experience during the time of final exams, such as social constraints, outside of school factors, or students' overall emotional and mental well-being. Although final exams can in itself be the cause of stress students experience, additional research will be needed to identify additional stressors students could be experiencing to in order to better assist the students during this time period.

Second, additional research needs to be conducted to explore why so few males choose to participate in TDAA compared to females. In this study, over twice as many females participated in the TDAA than males did. Additional research can help identify the causes of this gender gap and provide suggestions to improve the program to make it more attractive to male students.

Third, the results of this study found that none of the participants experienced a change in stress levels from the time they left the therapy dogs to the time they decided to leave SLAC. Future research needs to be conducted to better evaluate the impacts the

TDAA had on student's stress levels and how long the TDAA affects students before they began to experience a rise in stress levels again.

Fourth, longitudinal research needs to be conducted to see if having therapy dogs present on campuses year round will better help students regulate stress levels throughout the academic school year. This research would address the students' overall stress levels and stress managements over the academic school year, and if students would be more willing to seek additional therapeutic or counseling services during other stressful times during the academic year knowing a therapy dog service is available.

Fifth, research needs to be conducted to investigate how influential therapy dog assisted activities were on helping students reduce their stress levels compared to other types of study breaks. Traditional study breaks could include coffee breaks, meal breaks, naps, or stretching. Although there are multiple activities that could be defined as a study break, future research could explore which of these types of breaks have the most significant impacts on students' stress levels while studying.

Lastly, because this research used self-reporting data, some may argue that the results in this study are not completely valid. To gain a more accurate understanding of how therapy dog interactions impacts student's stress levels, additional research will need to be conducted that includes a biochemical (i.e. saliva) or physical (i.e. heart rate) element. The findings will provide a more precise analysis of how much stresses students were actually philologically experiencing before, during, and after their time with therapy dog.

APPENDIX SECTION

Appendix A

CONSENT FORM

This project 2014S3043 was approved by the Texas State IRB on April 22nd, 2014. Pertinent questions or concerns about the research, research participants' rights, and/or research-related injuries to participants should be directed to the IRB chair, Dr. Jon Lasser (512-245-3413 - lasser@txstate.edu) and to Becky Northcut, Director, Research Integrity & Compliance (512-245-2314 - bnorthcut@txstate.edu).

Investigator: Ashley Asel
Texas State University
E-mail: aaa89@txstate.edu

Title of Study: The Effects of Therapy Dog Interactions on College Students'
Perceptions of Final Exam-Related Stress

Purpose of Study: You are being asked to participate in a research study designed to identify perceived changes to stress levels after interacting with therapy dogs while studying for their final exams. This study will be conducted under the supervision of Dr. Jodi Patrick Holschuh, Associate Professor, Texas State University (holschuh@txstate.edu)

Procedures: You will be asked to complete three brief surveys: All participants will complete the first fourteen-item survey, which will take two to five minutes to complete. The second three-item survey will take place while studying for exams at SLAC. There will be two version of the second three-item survey for the control and TDAA Group and will take one to two minutes to complete. The final three-item survey will be completed upon leaving SLAC, which will take one to two minutes to complete. Participants completing all three parts of the survey will be entered into a drawing for a gift card.

Funding Source: No funding source will be used for this study

Risks: The researcher will not require any participant to interact with the therapy dogs, making therapy dog interaction a voluntary experience.
In the unlikely occurrence of any harm done to the participant or therapy dog, all participants and therapy dogs are covered by Pet Partners CGLI Insurance Policy. For participants who

	do not interact with therapy dogs, no risks greater than those of daily life are present.
Benefits:	By gaining a better understanding of the effects of therapy dog interactions on students' perceived stress levels, this research has the potential to help current and future students manage stress levels during final exams. Also, other student support programs and institutions can potentially benefit from these findings as they can provide therapy dog services to their current and future students to help them manage their stress levels during final exams.
Costs/incentives:	Participants who complete all three portions of the survey will be entered into a drawing for a \$25 Wal-Mart gift card.
Confidentiality	The results of this participation will be confidential and will not be released in any individually identifiable form without my prior consent, unless otherwise requested by law. All data will be confidential and not matched to participants' name. All data collected will be assigned a unique number that is not connected to the participant's names.
Use of information:	The use of the information will be used for the researcher's thesis study and will be used to write manuscripts that will be submitted for publication in the future.
Voluntary	The participants may withdraw from the study at any time, or decline to
Participation	participate, without any penalty.
Signature:	The investigator has discussed the project with me and answered all my questions. I agree with the terms above and acknowledge that I have been given a copy of the consent form. By signing this consent form, I agree to participate in this research project.

Signature of the Participant

Date

Appendix B

Time 1 Survey for Control and TDAA Group

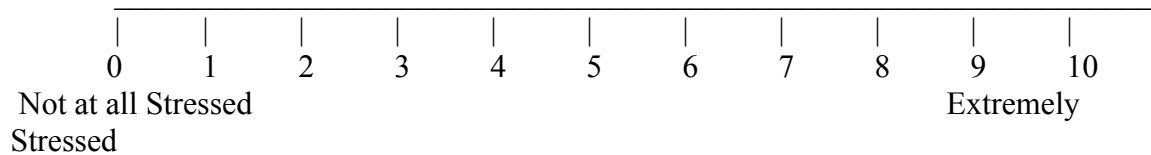
Directions: Please complete this survey upon entering the SLAC

1) Please write your First Name: _____ Last Name: _____

(Your name will be removed from the survey upon completion of the three surveys. This will allow us to identify all three of your surveys).

Please answer the following questions in regards to your experiences studying for final exams today:

2) Please circle a number below that best represents your current stress level about final exams:



3) I worry whether I'm able to cope with all my work when studying for final exams

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree or disagree
- ☐ Disagree
- ☐ Strongly disagree

4) As time runs out before my final exam, my heart begins to race

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree or disagree
- ☐ Disagree
- ☐ Strongly disagree

5) I get tense and nervous while studying for final exams

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree or disagree
- ☐ Disagree
- ☐ Strongly disagree

6) I worry whether I have properly understood the material going into a final exam

- ☐ Strongly agree

- ☐ Agree
- ☐ Neither agree or disagree
- ☐ Disagree
- ☐ Strongly disagree

7) I worry whether the final exam will be too difficult

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree or disagree
- ☐ Disagree
- ☐ Strongly disagree

8) I get so nervous I wish I could just skip the final exam

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree or disagree
- ☐ Disagree
- ☐ Strongly disagree

9) I worry whether I have studied enough for final exams

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree or disagree
- ☐ Disagree
- ☐ Strongly disagree

Please answer the following demographic questions:

10) Gender: ☐ Male ☐ Female

11) Current Age: _____

12) Current Academic Status:

- ☐ Freshman ☐ Sophomore
- ☐ Junior ☐ Senior

13) Race/Ethnicity:

- ☐ African American
- ☐ Asian/ Pacific
- ☐ Caucasian
- ☐ Hispanic/ Latino
- ☐ Native American
- ☐ Other: _____

14) What are your current living conditions?

- ☐ On-campus living

☐ Off-campus living

15) Do you live with a dog?

☐ Yes

☐ No

16) In the box below, please tell us the class(es) you are currently studying for. Please include the class name and the course number and any additional comments.

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Appendix C

Time 2 Survey for TDAA Group

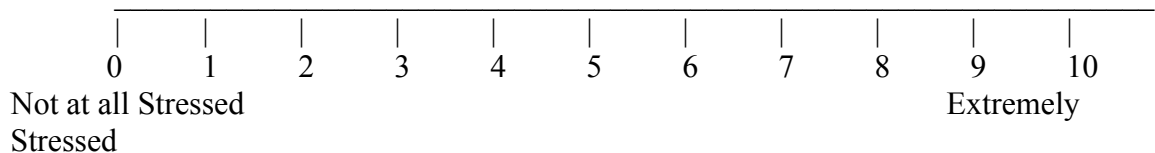
Directions:

(TDAA Group) Please fill out after you have completed your time in SLAC, before you leave the center.

1) Please write your First Name: _____ Last Name: _____

(Your name will be removed from the survey upon completion of the three surveys. This will allow us to identify all three of your surveys).

2) Please circle a number below that best represents your current stress level about final exams:



3) Please share with us any additional comments about your experience studying for final exams and your experience with the therapy dogs today in SLAC:

Time of Completion: _____

Appendix D: Time 3 Survey for TDAA Group

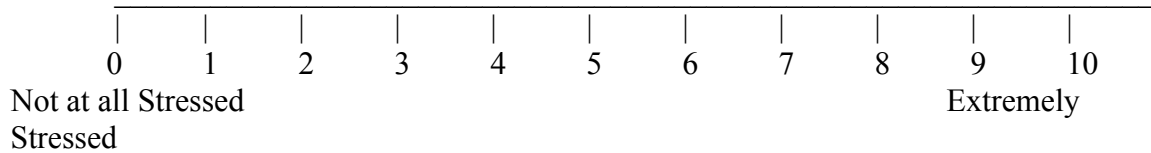
Directions:

(TDAA group) Please fill out after you have completed your time in SLAC, before you leave the center.

1) Please write your First Name: _____ Last Name: _____

(Your name will be removed from the survey upon completion of the three surveys. This will allow us to identify all three of your surveys).

2) Please circle a number below that best represents your current stress level about final exams:



3) Please share with us any additional comments about your experience studying for final exams today in SLAC:

Time of Completion: _____

Appendix E: Time 2 Survey for Control Group

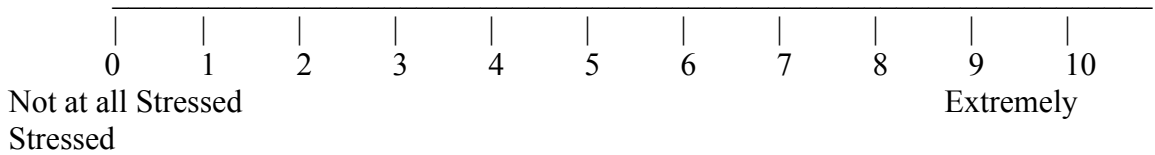
Directions:

(Control group) Please fill out this survey while you are studying


1) Please write your First Name: _____ Last Name: _____

(Your name will be removed from the survey upon completion of the three surveys. This will allow us to identify all three of your surveys).

2) Please circle a number below that best represents your current stress level about final exams:



3) Please share with us any comments you may have about your experiences studying for your final exams today in the box below:



Time of Completion: _____

Appendix F

Time 3 Survey for Control Group

Directions:

(Control group) Please fill out after you have completed your time in SLAC, before you leave the center.

1) Please write your First Name: _____ Last Name: _____

(Your name will be removed from the survey upon completion of the three surveys. This will allow us to identify all three of your surveys).

2) Please circle a number below that best represents your current stress level about final exams:

0	1	2	3	4	5	6	7	8	9	10
Not at all Stressed					Extremely					
Stressed										

3) Please share with us any additional comments about your experience studying for final exams today in SLAC:

Time of Completion: _____

REFERENCES

- Abella, R., & Heslin, R. (1989). Appraisal processes, coping, and the regulation of stress-related emotions in a college examination. *Basic and Applied Social Psychology*, 10(4), 311-327.
- Adamle, K., Carlson, T., & Riley, T. (2009). Evaluating college student interest in pet therapy. *Journal of American College Health*, 57, 545-548. doi: 10.3200/JACH.57.5.545-548
- Allen, K. (2003). Are pets a healthy pleasure? The influence of pets on blood pressure. *Current Directions in Psychological Science*, 12(6), 236-239. doi: 10.1002/pfi.21361
- American Kennel Club. (n.d.). *About canine good citizen*. Retrieve from <http://www.akc.org/dog-owners/training/canine-good-citizen/what-is-canine-good-citizen/>
- Anderson, E., & Cole, B. (1988). Stress factors related to reported academic performance and burnout. *Education*, 108(4), 497-503. doi:
- Anderson, K. (2007). Who let the dog in? How to incorporate a dog into a self-contained classroom. *Teaching Exceptional Children Plus*, 4(1), 2-17.
- Anxiety and Depression Association of America. (n.d.). *Stress*. Retrieved from <http://www.adaa.org/understanding-anxiety/related-illnesses/stress>
- Assistance Dogs International. (n.d.). *Guide to Assistance Dogs Law*. Retrieved from Assistance Dogs International: <http://www.assistedogsinternational.org/wp-content/uploads/2012/01/ADI20062ndprint.pdf>
- Astorino, T., Bomboy, N., & Jalongo, M. (2004). Canine visitors: The influence of

therapy dogs on young children's learning and well-being in classrooms and hospitals. *Early Childhood Education Journal*, 32(1), 9-16. doi:1082-3301/04/0800-0009/0

Balogun, S., Monteiro, N., & Oratile, K. (2014). Managing stress: The influence of gender, age and emotion regulation on coping among university students in Botswana. *International Journal of Adolescence and Youth*, 19(2), 153-173.

Bardi, M., Koone, T., Mewldt, S., & O'Connor, K. (2011). Behavioral and physiological correlates of stress related to examination performance in college chemistry students. *The International Journal on the Biology of Stress*, 14, 577-566. doi: 10.3109/10253890.2011.571322

Barker, C., Elliot, R., Pishtrang, N. (2002). Chapter 6: Self-report methods. In *Research methods in clinical psychology: An introduction for students and practitioner* (3rd Ed.) (pp. 96-119). Malden, MA: John Wiley & Sons. doi:10.1002/0470013435.ch6

Barker, S., Knisely, J., McCain, N., Pandurangi, A., & Schubert, C. (2010). Exploratory study of stress-buffering response patterns from interaction with a therapy dog. *Anthrozoos*, 23(1), 79-91.

Bell, A. (2013). Paws for a study break: Running an animal assisted therapy program at the Gerstein Science Information Centre. *The Canadian Journal of Library and Information Practice and Research*, 8(1), 1-14.

Brender, N., Billy, J., & Grady, W. (2003). Assessment of factors affecting the validity of self-reported health-risk behavior among adolescence: Evidence for the scientific literature. *Journal of Adolescent Health*, 33, 436-457.

- Brougham, R., Mendoza, C., Miller, J., & Zail, C. (2009). Stress, sex differences, and coping strategies among college students. *Current Psychology*, 28(2), 85-97.
- Burton, R., & Hinton, J. (2004). Letters to the editor: Defining stress. *Medical Education*, 38, 1013-1016. doi:10.1111/j.1365-2929.2004.01970.x
- Carpenter, L., Kelly, M., Price, L., & Tyrka, A. (2008). Sex differences in the use of coping strategies: Predictors of anxiety and depressive symptoms. *Depression and Anxiety*, 25, 839-846.
- Crosson, C., & Foreman, K. (2012). Canines for combat veterans: The national education for assistance dog services. *U.S. Army Medical Department Journal*, 61-62.
- Davidson, K., Freedland, K., Mohr, D., & Schwartz, J. (2011). Usual and unusual care: Existing practice control groups in randomized controlled trials of behavioral interventions. *Psychosom Med.*, 73(4), 323-335.
- Divine Canines (n.d.). *Divine Canines*. Retrieved from <http://www.divinecanines.org/index.php>
- Dodge, K., Ptacek, J., & Smith, R. (1994) Gender differences in coping with stress: When stressors are appraisals do not differ. *Personality & Social Psychology Bulletin*, 40, 421-430.
- Dogar, A., Eman, S., Haider, N., & Khalid, M. (2012). Gender difference in test anxiety and examination stress. *Journal of Pakistan Psychiatric Society*, 9(2), 85-90.
- Eisenberg, D., Goldberstein, E., & Gollust, E. (2007). Help-seeking and access to mental health care in a university student population. *Medical Care*, 45, 594-601.
- Evans, N., & Gray, C. (2011). The practice and ethics of animal-assisted therapy with children and young people: Is it enough that we don't eat our co-workers? *British*

- Journal of Social Work*, 42(4), 1-18. doi:10.1093/bjsw/ber091
- Fine, A. H. (2006). *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice* (2nd ed.). San Diego, CA: Academic Press.
- Folkman, S., & Lazarus, R. (1980). An analysis of coping in middle-age community sample. *Journal of Health and Social Behavior*, 21, 219-232.
- Francis, A. (2009). Thursdays with MacGyver: The benefits of a library therapy dog. *Children & the Journal of the Association for Library Service to Children*, 7(2), 50-52.
- Frazier, P., Hintz, S., & Meredith, L. (2015). Evaluating an online stress management intervention for college students. *Journal of Counseling Psychology*, 62(2), 137-147. doi:10.1037/cou0000014
- Freedheim, D., & Weiner, I. (2003). *Handbook of psychology volume 1: History of psychology*. Hoboken, NJ: John Wiley & Sons.
- Geist, T. (2011). Conceptual Framework for Animal Assisted Therapy. *Child Adolescent Social Work Journal*, 28(1), 243-256. doi:10.1007/s10560-011-0231-3
- Goetz, T., Pekrun, R., & Perry, R. (2005). Academic emotions in student's self-regulated learning and achievement: A program of quantitative and qualitative research. *Educational Psychologist*, 37, 91-106.
- Gonzalez-Ramirez, M., Landero-Hernandez, R., & Ortiz-Jimenez, X. (2013). Cognitive behavioral therapy and animal-assisted therapy. *Alternative and Complementary Therapies*, 19(5), 270-275. doi:10.1089/act.2013.19505
- Goodnite, P. (2014). Stress: A concept analysis. *Nursing Forum*, 49(1), 71-74.
- Google. (2015). *Final exams and student stress*. Retrieved from Google Search Engine:

<https://www.google.com/#q=final+exams+and+student+stress>

Heath, J., Hetherly, K., Nichols, B., Weathers, J., & Wood, G. (2013, January 22).

Therapy dog pilot proposal [Letter to R. Clark]. Texas State University, San Marcos, TX.

Hitchman, G., Jackson, T., Li, H., Li, W., Qiu, J., Sun, J., Wei, D., & Zhang, G. (2014).

Neuroanatomical differences between men and women in help-seeking coping strategy. *Scientific Reports*, 4, 1-5.

Kavakli, M., Li, M., & Rudra, T. (2012). Towards the development of a virtual counselor to tackle students' exam stress. *Journal of Integrated Design & Process Science*, 16(1), 5-26. doi:10.3233/jid-2012-0004

Lloyd, D. Turner, R., & Wheaton, B. (1995). The epidemiology of social stress.

American Sociological Review, 60, 194-205.

Lust, K., Ehlinger, E., & Golden, D. (2010). *College student health survey report: Health and health-related behaviors Minnesota postsecondary students*. Retrieved from <http://www.bhs.umn.edu/surveys/index.htm>

Manenica, I., & Šimić, N. (2012). Exam experience and some reactions to exam stress.

Human Physiology, 38(1), 67. doi: 10.1134/S0362119712010161

Matchock, R., & Polheber, J. (2013). The presence of a dog attenuates cortisol and heart rate in the trier social stress test compared to human friends. *Journal of*

Behavioral Medicine, 5, 860-867. doi:10.1007/s10865-013-9546-1

Matud, M. (2004). Gender differences in stress and coping styles. *Personality and*

Individual Differences, 26(1), 141-157.

Moses, T. (2009). Stigma and self-concept among adolescents receiving mental health

- treatment. *American Journal of Orthopsychiatry*, 79(2), 261-274.
- Pedhazur, E., & Schmelkin, L. (1991). *Measurement, design, and analysis: An integrated approach*. Hillsdale, NJ: Lawrence Erlbaum.
- Pet Partners. (n.d.). *Understanding the Differences Between AAA and AAT*. Retrieved from <http://www.petpartners.org/page.aspx?pid=321>
- Price, M. (2013). Convenience samples: What they are, and what they should (and should not) be used for. Retrieved from <https://hrdag.org/2013/04/05/convenience-samples-what-they-are/>
- Putwain, D. (2007). Researching academic stress and anxiety in students: Some methodological considerations. *British Educational Research Journal*, 33(2), 207-219. doi:10.1080/01411920701208258
- Rabschutz, L., & Reynolds, J. (2011). Studying for exams just got more relaxing—animal-assisted activities at the University of Connecticut Library. *College & Undergraduate Libraries*, 18, 359-367. doi:10.1080/10691316.2011.624934
- Selye, H. (1977). A code for coping with stress. *AORN Journal*, 25(1), 35-42.
- Shiloh, S., Sorek, G., & Terkel, J. (2003). Reduction of state-anxiety by petting animals in a controlled laboratory experiment. *Anxiety, Stress, and Coping*, 16(4), 387-395. doi: 10.1080/1061580031000091582
- Stevens, J. (2007). *Intermediate statistics: A modern approach* (3rd ed.). New York, NY: Routledge.
- Student Learning Assistance Center. (n.d.). *What is SLAC*. Retrieved from Texas State University: <http://www.txstate.edu/slac/about/overview.html>
- Walsh, F. (2009). Human-animal bonds I: The relational significance of companion

animals. *Family Process*, 48, 460-480.