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An Examination of the Anxiolytic Effects of Interaction with a Therapy Dog

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AN EXAMINATION OF THE ANXIOLYTIC EFFECTS OF INTERACTION WITH A
THERAPY DOG

A Dissertation

Submitted to the School of Graduate Studies and Research

In Partial Fulfillment of the
Requirements for the Degree
Doctor of Psychology

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Indiana University of Pennsylvania

August 2008

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Animal-assisted therapy (AAT) involves a goal-directed intervention in which an animal is an integral part of the treatment process. The use of AAT is becoming increasingly popular in a variety of fields, including mental health care. Anxiety is one of the primary psychological constructs that has been addressed through the use of AAT in the mental health field. Although there is a wealth of anecdotal information and supposition to support the use of AAT, as well as some research, there remains a lack of methodologically sound empirical research supporting the use of these interventions.

The present study explored the use of AAT to address heightened anxiety. This was done through exposing study participants to an anxiety-provoking public speaking task and then exposing them to interaction with 1) a therapy dog/handler team, 2) a friendly person, or 3) no human or animal interaction. All participants completed self-report measures of anxiety before presentation of the public speaking task, after preparing for the task, following a fifteen-minute delay during which the experimental intervention occurred, and following completion of the public speaking task. Interaction with a therapy dog/handler team resulted in significantly lower levels of reported anxiety than interaction with a person or no interaction with a person or animal. There was no difference in reported anxiety

levels for interaction with a person compared to no interaction with a person or therapy dog/handler team. Study findings indicate that interaction with a therapy dog is beneficial in decreasing anxiety during stressful situations, and the mere presence of a therapy dog/handler team in the room may be enough to lower anxiety levels. The need for further research is discussed.

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CHAPTER I

THE PROBLEM

Definition of Animal-Assisted Therapy

The therapeutic use of animals has been referred to by many names, including pet therapy, pet-oriented therapy, pet-facilitated therapy; pet-enhanced therapy; animal-assisted therapy, animal-facilitated therapy, and others (Janssen, 1998). Currently, the most widely accepted terms and definitions are those put forth by the Delta Society (Janssen). The Delta Society defines animal-assisted therapy (AAT) as “a goal-directed intervention in which an animal is an integral part of the treatment process. AAT is directed and/or delivered and documented by a health/human service professional with a specific clinical goal for a particular individual in mind” (Gammonley et al., 1997 p.4). AAT is distinguished from animal-assisted activities (AAA), which are defined by the Delta Society as “interaction with animals that provides opportunities for motivational, educational, recreational, and/or therapeutic benefits to enhance quality of life. AAA is delivered in a variety of environments by specially trained professionals, paraprofessionals, and/or volunteers, in association with animals that meet specific criteria” (Gammonley et al., p.4).

AAA frequently involves volunteer teams consisting of one human and one animal visiting facilities such as hospitals or nursing homes in order to allow the residents of these facilities the opportunity to interact with an animal. Other examples of AAA might include resident animals in a nursing facility, or the presence of fish in a doctor’s waiting room. In these cases, the interaction with or

presence of the animals is expected to have beneficial effects on the recipients of AAA, but there is no particular goal or expectation for what benefits may occur. For an interaction to be considered AAT, however, there must be a professional from the relevant field involved and the animal must be utilized in a goal-directed manner in accordance with a specific treatment plan (Gammonley et al.).

Statement of the Problem

Although there are many anecdotal reports of the effectiveness of animal-assisted therapy, serious attempts to research AAT issues in a careful way are still subject to a number of limitations. Until fairly recently, the majority of research on AAT and other aspects of human-animal interaction has been either descriptive or correlational in nature (Wilson & Barker, 2003). Although assumptions about causal relationships cannot be made on the basis of this type of research, many practitioners in the field of AAT have used this type of information as the basis for claims of the effectiveness of AAT interventions (Beck & Katcher, 2003).

The body of experimental research is growing; however, too many of these experimental designs have been subject to serious limitations. Some studies have been limited by small sample sizes, and even the larger sampled studies have rarely used randomly selected subjects, severely limiting the generalizability of study results (Nimer & Lundahl, 2007; Wilson & Barker, 2003). Studies in AAT have also been plagued by other methodological issues including a lack of appropriate control groups and failure to control extraneous variables that may influence outcomes (Nimer & Lundahl; Souter & Miller, 2007; Wilson & Barker).

The current study represents an attempt to address some of the limitations in previous research on AAT, focusing on the use of AAT to alleviate anxiety. Previous studies that looked at AAT's effect on anxiety have been fraught with methodological limitations, such as utilizing the subject's own pet for interaction (Allen, Blascovich, Tomaka, & Kelsey, 1991). While research on the effects of interaction with one's own pet are important, actual AAT interventions involve interaction with a non-owned animal, usually as part of an animal/handler therapy team. Therefore it is important that research designs use similar teams in order to be more applicable to real-world situations. Still other studies have failed to experimentally or naturally induce increased anxiety in the participant population before attempting to assess the anxiolytic effects of the animals (e.g., Wilson, 1991). The use of experimentally-induced anxiety allows for an effective analogue of normal individuals (those not diagnosed with any clinical symptoms of anxiety or other disorders) who find themselves experiencing temporarily increased anxiety in a stressful situation. Such temporarily increased anxiety can occur in a number of situations where AAT might be (and in many cases has been) incorporated such as doctor or dentist visits, hospital waiting rooms, and even initial sessions with a new therapist. Failure to induce increased anxiety prior to assessing the effect of interaction with the therapy animal does not properly capture the ability that interaction with an animal may have to actually decrease heightened anxiety rather than serving as a neutral or relaxing activity when the subject is already calm. Other studies have used populations that were not randomly selected and were suffering from serious mental disorders (e.g., Barker & Dawson, 1998;

Barker et al., 2003). While it is important to address the effects of AAT with different populations, the lack of random selection in previous studies has been problematic. Additionally, there has been a lack of research looking at the effects of AAT interventions on normal adult populations, although some studies have addressed the effects of AAT on normal children. (e.g., Hansen et al., 1999; Havener, et al., 2001; Nagengast et al., 1997). Research with non-clinical samples is necessary to determine if AAT benefits are applicable to people in general, or if AAT is only effective with certain clinical populations.

The Present Study

The present study involved examination of the anxiolytic effects of interaction with a therapy dog and handler team compared to interaction with a friendly person compared to no human or animal interaction during an anxiety-inducing public speaking task. A 3 (group condition) x 4 (time) repeated measures design, with two factors of interest, group and time of assessment, was used. The dependent variable, transient levels of subjective anxiety, was measured at four times: before the presentation of the stressor, following the presentation of the stressor, following a 15-minute delay during which the experimental intervention occurred, and after the conclusion of the stressor. A detailed timeline for the study is described in the Method section.

A large, randomly selected sample of adults was used, allowing for greater generalizability of results than those usually found in AAT research. Random assignment to experimental and control groups occurred, and the study procedures were carefully designed to minimize the influence of extraneous

variables. Attempts were made to include in the study additional factors that may influence participants' responses to the AAT intervention, such as general trait anxiety level, attitude toward pets, and fear of public speaking which may influence how much anxiety is induced during the anxiety-provoking public speaking task. Information about these variables along with demographic information was collected at the first assessment point.

Hypotheses

There are several hypotheses generated by the current study. First, it is hypothesized that during a stressful situation, individuals who experience interaction with a therapy dog and handler demonstrate significantly lower levels of anxiety than individuals who experience interaction with a friendly person, who in turn experience lower levels of anxiety than individuals who remain by themselves.

It is also hypothesized that individuals demonstrate increased anxiety following the presentation of a public-speaking task compared to baseline levels of anxiety, and that, without intervention, anxiety continues to increase for individuals waiting to speak publicly. This is consistent with research that demonstrates increased anxiety when individuals are assigned a public speaking task (Lipper & McNair, 1972), and that levels of anxiety during these tasks peak just prior to the beginning of delivering the speech (Behnke & Sawyer, 2000). It is further hypothesized that following the conclusion of the public speaking task, the individuals' level of anxiety decreases to at or below baseline levels, reflecting relief that the anxiety-inducing task has concluded.

Another hypothesis states that individuals who report higher levels of trait anxiety report experiencing higher levels of state anxiety prior to engaging in a public speaking task. Similarly, it is hypothesized that individuals who report higher levels of fear of public speaking report experiencing higher levels of anxiety prior to engaging in a public speaking task than those who report lower levels of fear of public speaking. It is further hypothesized that interacting with a therapy dog results in a greater decrease in reported anxiety levels for those individuals reporting higher levels of trait anxiety and public speaking fear compared to those who are less anxious or fearful.

Although it has been suspected that individuals with a more favorable attitude toward pets might benefit more from AAT interventions, the research thus far has found that individuals' attitude toward pets appears to make no difference in the level of effectiveness for AAT interventions (Barker et al., 2003). Therefore, for the present study it is hypothesized that individuals who demonstrate a more favorable attitude toward pets do not differ from those with less favorable attitudes toward pets in the effect that interaction with a therapy dog has on their level of anxiety prior to engaging in a public speaking task.

Study Predictions

The following predictions were made prior to conducting the study, based on the study hypotheses:

Prediction 1: Following the intervention (Time 3), individuals who experience interaction with the therapy dog and handler would demonstrate significantly lower levels of anxiety than individuals who experience interaction

with a friendly person, who would in turn demonstrate lower levels of anxiety than the control group.

Prediction 2: Regardless of group condition, individuals would demonstrate increased anxiety following the presentation of the public-speaking task (Time 2) compared to baseline levels of anxiety (Time 1).

Prediction 3: Anxiety would continue to increase from Time 2 to Time 3 for the control group, but not for the person or dog groups.

Prediction 4: The level of anxiety for all groups would decrease at Time 4 to at or below baseline levels, reflecting relief that the anxiety-inducing task had concluded.

Prediction 5: Individuals who reported higher levels of trait anxiety, as measured by the STAI-T at Time 1, would report higher levels of state anxiety at all four measurement times compared to those who demonstrated lower levels of trait anxiety.

Prediction 6: Individuals who reported greater fear of public speaking, as measured by the AAS at Time 1, would report higher levels of state anxiety at all four measurement times compared to those who demonstrated less fear of speaking in public.

Prediction 7: Individuals in the dog group who reported higher levels of trait anxiety and/or fear of public speaking would report a greater decrease in anxiety at Time 3 than those who reported lower levels of anxiety/fear.

Prediction 8: Following interaction with the therapy dog, those individuals in the dog group who reported a more favorable attitude toward pets would not differ in their levels of reported anxiety compared to individuals with a less favorable attitude toward pets.

CHAPTER II

REVIEW OF THE LITERATURE

History of the Therapeutic Use of Animals

The documented history of the use of animals to benefit human health extends back as far as the 17th century. Writing in 1699, John Locke advocated giving children animals to care for as a means of encouraging them to develop tender feelings and a sense of responsibility (as cited in Serpell, 2000 p. 12). The suggested use of pets as a way to develop responsibility, kindness, and self-control remained popular throughout the 18th and 19th centuries and this type of self-improvement philosophy remains one of the reasons for engaging in pet ownership today (Serpell).

In addition to the emotional benefits of pet ownership for the average person, there is a long history of using animals to treat mental illness as well. In the wake of institutional reform in the treatment of the mentally ill that occurred during the 18th and 19th centuries, the introduction of “tame animals” into the institutions was suggested and frequently implemented by progressive groups (Kruger, Trachtenberg, & Serpell, 2004). For example, in 1792 the York Retreat in England developed a program for the treatment of insane persons that incorporated the presence of animals such as birds and rabbits as well as the use of activities like gardening and courtyard exercise into treatment plans (Jorgenson, 1997).

Animals were largely displaced in terms of therapeutic uses following the advent of scientific medicine toward the end of the nineteenth century (Kruger et

al., 2004). However, there was a small resurgence in the therapeutic use of animals in 1919, when then current Secretary of the Interior, Franklin K. Lane suggested the use of dogs with psychiatric patients at St. Elizabeth's Hospital in Washington, D.C. (Hooker, Freeman, & Stewart, 2002). In the 1940s, animals were used at the Pawling Army Air Force Convalescent Hospital in Pawling, New York to improve mood and provide a diversion for convalescing veterans (Hooker et al.). The therapeutic use of animals in health care and other settings continued on a small scale throughout the mid-20th century (Jorgenson, 1997).

Current Applications of Animal-Assisted Therapy

Practitioners from many diverse fields are now choosing to incorporate AAT into their practices in ever-increasing numbers, and one rapidly growing field is AAT in psychotherapy (Parshall, 2003). A variety of mental health practitioners are choosing to incorporate AAT into their professional practice (Hart, n.d.). Animals have been incorporated into psychotherapy in a variety of ways and with many different populations (Chandler, 2005; Nimer & Lundahl, 2007). According to Kruger et al. (2004) "some of the diagnoses and problems to which AAT has been applied are anxiety; eating disorders; mood disorders; suicidality; obsessive-compulsive disorder; post-traumatic stress disorder; attention deficit hyperactivity disorder; conduct disorder; substance abuse; recovery from physical-, sexual-, or emotional abuse; and interpersonal and relationship deficits" (p. 12).

Animal-assisted therapy is not a particular therapy modality like cognitive-behavioral or psychodynamic therapies; rather, it is a therapeutic technique that can be incorporated into whatever theoretical orientation the practitioner chooses

to use (Chandler, 2005). Specific ways in which the animal can be incorporated into therapy are many and varied. According to Fine (2000), some of the ways that animals may be therapeutically beneficial include acting as a social lubricant, building rapport, as a catalyst for emotion, as an adjunct to the clinician, and for role modeling. Within the therapy sessions, the use of the animal may be largely undirected, with the animal's presence providing comfort or material for discussion, or the animal may be used in a more directive manner, with the therapist instructing the client to interact with the animal in a particular way, such as giving the animal commands or talking to the animal instead of to the therapist (Kruger et al., 2004).

Dogs are the most widely used therapy animals (Nimer & Lundahl, 2007). There are several reasons for the prominent use of dogs, including their wider availability compared to other types of animals, their greater trainability, and decreased risk of zoonotic infections compared to other species such as cats or birds (Brodie, Biley, & Shewring, 2002). Horses are the next most widely used animals in therapeutic settings (Fredrickson & Howie, 2000).

In addition to dogs and horses, other commonly used animals include cats, rabbits, and birds. Less common, but still occasionally used, animals include small animals such as hamsters and guinea pigs, farm animals like cows, pigs, and goats, and even llamas (Dossey, 1997). The use of fish aquariums is also common in some settings (Brodie & Biley, 1999). Animals that are used for therapy purposes are generally registered with one of the organizations that screen and certify therapy animals. The most widely accepted organizations for

therapy-animal registration are the previously mentioned Delta Society, and Therapy Dogs International (Chandler, 2005). Both organizations require animal/handler teams to pass a certification test that demonstrates the animal's appropriate temperament and behavior and the handler's ability to effectively control the animal in different situations.

Research on Animal-Assisted Therapy

The first published research on the use of animals in therapy occurred in the 1960s. Psychiatrist Boris Levinson became aware of the benefits of using an animal in psychotherapy when he left his dog, Jingles, with a child who was extremely withdrawn and refusing to speak. Levinson (1969) reported returning to the room after several minutes' absence to find the previously mute child talking earnestly to the dog. Intrigued by this discovery, Levinson began to employ Jingle's presence deliberately in therapy sessions with a number of children he saw over the next several years. Levinson kept careful records of the interventions used and the effects they had on his patients, publishing his work in 1969 in a book titled *Pet Oriented Child Psychotherapy*. Levinson followed this publication with numerous articles and gave many lectures on the subject of what he termed "pet therapy" throughout the remainder of his life (Mallon, Ross, & Ross, 2000).

Levinson and a few other researchers continued to publish articles on the benefits of what was termed the "human-animal bond" during the 1970s and early 1980s. These publications consisted primarily of anecdotal accounts, but there were some attempts to carry out quantitative research such as that exploring the effect of interaction with animals on adolescents and adults in inpatient psychiatric

units conducted by Corson, Corson, Gwynne, and Arnold (1975) and Corson and Corson (1978).

In the 1980s the focus of research on the human-animal bond and the role animals play in health care changed with the publication of a groundbreaking study by Friedmann, Katcher, Lynch, and Thomas (1980). This publication reported the results of a study that looked at survival rates among heart-attack victims one-year after discharge from the hospital. The results showed that those individuals who owned a pet had a significantly greater survival rate than those who did not, even when the study controlled for variables such as age, gender, and severity of heart attack. The authors concluded that pet ownership is a significant variable related to one-year survival following heart attack. Following publication of this article, research began to focus on the protective benefits of pet ownership for both physical and mental health, and this became one of the most frequently referenced studies in the field (Hooker et al., 2002). Later research supported the original study's findings (e.g., Reade, 1995) and research that focused on the influence of companion animals on physiological signs of health proliferated. Additional studies have supported the findings that pet ownership has benefits for human health, including lowering blood pressure and heart rates (Wilson, 1998). Other significant effects of pet ownership on a variety of physical indicators of health include "changes in systolic and diastolic blood pressure, plasma cholesterol, plasma triglyceride, and skin conductance responses" (Odendaal, 2000 p. 278).

Although the benefits of pet ownership have been well-documented, there is also research to suggest that people need not own an animal to receive benefits from human-animal interaction. For example Odendaal (2000) found that subjects who spent time with either their own dog or an unknown dog demonstrated similar increases in beta endorphin, oxytocin, prolactin, phenylacetic acid, and dopamine and decreases in cortisol. These changes were not apparent during quiet book reading, suggesting differential effects for interaction with animals compared to other calming activities.

Another study found that changes in salivary cortisol levels could be detected in nurses after they experienced as few as five minutes with a therapy dog (Barker, Knisely, McCain, & Best, 2005). These results suggest that even very short interactions with a therapy animal can have beneficial effects on health parameters related to stress. The results of similar studies looking at cortisol levels following other types of alternative or complementary therapies, such as music therapy, resting quietly, guided imagery, or watching a humorous movie, were not significant (Barker et al., 2005).

The use of AAT has become increasingly popular the fields of nursing and medicine, rehabilitation, occupational therapy, and education (Brodie & Biley, 1999). AAT has also been used with increasing frequency to address mental health issues. There is evidence that animal-assisted therapy is effective in addressing a variety of psychological symptoms with various populations. A meta-analysis by Souter and Miller (2007) examining the use of AAA/AAT to treat depression reported finding significant effects of medium magnitude, suggesting

that the use of AAA/AAT is associated with fewer depressive symptoms. AAT has also been reported to be effective in improving mood, decreasing loneliness and increasing social interactions for the elderly in nursing homes. Interventions showing positive effects have included visits from human-dog therapy teams (Lutwack-Bloom, Wijewickrama, & Smith, 2005; Banks & Banks, 2002) and the introduction of birds into nursing home settings (Holcomb, Jendro, Weber, & Nahan, 1997; Jessen, Cardiello, & Baun, 1996).

Interactions with therapy animals have also demonstrated benefits for elderly individuals with dementia (Richeson, 2003; Haughie, Milne, & Elliott, 1992) and institutionalized schizophrenics (Nathans-Barel, Feldman, & Berger, 2005; Kovacs, 2004; Barak, Savorai, Mavashev, & Beni, 2001). Additionally, AAT interventions have demonstrated effectiveness with populations such as depressed college students (Folse, Minder, Aycock, & Santana, 1993); emotionally and behaviorally disturbed children (Kogan, Granger, & Fitchett, 1999) and children with severe disabilities (Heimlich, 2001), among others.

A 2007 meta-analysis conducted by Nimer and Lundahl examined 250 published studies on AAT, with 49 studies meeting inclusion criteria for their analyses. The authors reported that overall, AAT was associated with moderate effect sizes in improving outcomes in the four areas examined. These included autism-spectrum symptoms, medical difficulties, behavioral problems, and emotional well-being. They authors concluded that AAT appears to be effective, and specific participant or treatment characteristics do not appear to significantly influence the outcomes. The authors also noted that the wide range of problems

targeted by AAT and the considerable variation in type and duration of AAT services makes it difficult to draw conclusions about exactly what AAT is and how it is best used. They further noted the need for additional quantitative research in the field, suggesting that anecdotal reports and case studies are not needed as much as rigorous scientific investigations.

The Role of the Handler

Most types of AAT interventions involve therapy teams composed of a registered therapy animal and the animal's handler. Because the animal and its handler are always together during the intervention, it is difficult to separate the effects of interacting with the animal from effects that may be due to interacting with the handler. There has been some published research that has attempted to address this issue. Hendy (1987) compared elderly nursing home residents' behavior during interactions with a pet alone, interaction with the pet and a person simultaneously, and interaction with a friendly person alone. This study found that people responded well to the pets and pets with people, but interactions with a person alone were associated with the highest number of positive resident behaviors.

Another study with elderly nursing home residents looked at the effects of interaction with a therapy dog compared to interaction with a friendly young person (Kaiser, Spence, McGavin, Struble & Keilman, 2002). In an attempt to control for the effect of the dog's handler, although the handler was present in the dog-interaction condition, the handler was instructed not to interact with the subjects in any way during the visit. These results showed no significant differences between

the conditions, suggesting that non-obligatory visits from a friendly person may be equally beneficial to visits from a therapy dog.

Lutwack-Bloom et al. (2005) conducted a study comparing therapy dog and handler visits to visits from a person without a dog. The study authors reviewed previous studies on this subject and attempted to control for many potentially confounding variables by using a matched sample of residents randomly chosen from two different nursing homes, one serving as the experimental group and the other the control, rather than residents from only one nursing home and having participants serve as their own controls by experiencing both conditions at different times. Study participants were visited three times a week for six months. The results of this study showed no significant effect on levels of depression for either group, while the experimental group (those receiving visits from dog and handler teams) showed significant improvement on a measure of general mood compared to the control group (those receiving visits from a person without a dog). The authors concluded that while visits from a friendly person may be beneficial, the addition of a dog did seem to have significant effects on overall mood, but did not significantly affect depression as it was measured in this study. Lutwack-Bloom et al. also noted that the significant improvement in mood for the dog-visitor group may result from the person's enjoyment of the human visitor as well as the dog, rather than just the dog alone. These authors noted that attempting to study a dog-only interaction group (without the inclusion of a handler) creates a situation that is not generalizable to real-life situations, where visiting dogs are always accompanied by handlers who interact with those being visited. The authors also

noted that people seem to be more likely to volunteer to make visits to nursing homes and other organizations when they can bring their dog than when they are required to go on their own, suggesting that the inclusion of animal visiting programs can lead to increased opportunities for those who are institutionalized to interact with another person as well as the animal. It remains somewhat unclear based on study results if interacting with a person can have the same effect as interacting with a dog and person in all situations in which AAT or animal visitation programs might be used.

Animal-Assisted Therapy and Anxiety

Anxiety is one of the primary psychological constructs that AAT has been used to address within a variety of populations. Currently, anxiety disorders are the most common type of mental health disorders, with lifetime prevalence rates of 16.6% for all anxiety disorders (Somers, Goldner, Waraich, & Hsu, 2006).

Additionally, anxiety is a component of more than 25 mental disorders listed in the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition, Text Revision (American Psychiatric Association, 2000). Anxiety symptoms often occur with other disorders, such as depression; most individuals with major depressive disorder also suffer from symptoms of anxiety (Dunner, Goldstein, Mallinckrodt, Lu, & Detke, 2003). Anxiety is also an important component of many experiences such as stressful medical procedures, speaking in public, test-taking, and others.

There are many accepted treatments for different types of anxiety, both medical and psychological. Because it is such a common problem, treatment of anxiety and anxiety-related problems is an important focus of research, and there

is a constant search for additional safe, effective, and inexpensive treatments for anxiety and related symptoms. There is an abundance of anecdotal support for the view that AAT may be an effective treatment for anxiety, as well as some research addressing this topic. There have been numerous studies conducted that have explored the effects of interacting with animals on subjective and objective measures of anxiety.

Allen et al. (1991) measured autonomic responses to stress in women asked to perform mental arithmetic in the presence of an experimenter only, with the added presence of a friend, and in the presence of the experimenter and their own pet dog. Subjects were 45 self-selected adult women, ranging in age from 27 to 55 years. Autonomic reactivity was assessed through measures of pulse rate, skin conductance, and blood pressure. Results showed that autonomic reactivity was significantly reduced in the dog-present condition compared to being alone with the experimenter, and that the friend-present condition resulted in a significant increase in autonomic reactions. The authors suggested that the dog may serve as a nonevaluative presence, providing social support and acting as a buffer against the subjects' stress, while the friends were perceived as evaluative, resulting in an increase in stress. Since the subjects were self-selected for the study and served as their own control group, generalizability of the results is limited. However, this study provided some of the first research-based evidence for the effect of interaction with animals on physical measures of stress.

The anxiolytic effect of interaction with a friendly, but unknown, dog was examined by Wilson (1991). In this study, 92 self-selected college undergraduates

were observed under each of three conditions: reading aloud, reading quietly, and petting a friendly dog. Anxiety was assessed through blood pressure monitoring and the use of a common self-report measure of anxiety, the Spielberg State Trait Anxiety Inventory (STAI). Results indicated that when reading aloud, subjects experienced significantly higher blood pressure and state anxiety scores compared to baseline and the other treatment conditions. Both the reading quietly and petting a dog conditions showed lower-than-baseline levels of blood pressure and self-reported anxiety, with reading quietly resulting in slightly lower scores than petting a dog. The authors concluded that petting an animal shows a relaxing or anxiolytic effect similar to other relaxation activities such as reading quietly; the effect did not vary based on race, sex, or pet ownership.

This study supported the potential for interaction with animals to decrease symptoms of anxiety. None of the conditions under which the subjects were tested was designed to elicit elevated levels of anxiety, however, and the interaction with the dog took place separately from the other conditions. Consequently, it is not clear from this study if interaction with a dog would serve to lower levels of anxiety in the presence of an anxiety-inducing stimulus or if the effects of interacting with the dog would be similar to merely engaging in any restful activity. Additionally, the subjects were self-selected to participate in the study, resulting in a lack of randomization that may have affected the results.

Barker and Dawson (1998) examined the effects of interaction with a therapy dog on the anxiety ratings of hospitalized psychiatric patients. Subjects were 230 men and women referred for daily recreation therapy while hospitalized.

A pre-and posttreatment crossover design was used for this study with subjects' changes in anxiety ratings being compared following a single session of animal-assisted group therapy and a single therapeutic recreation group session. In the AAT condition, subjects interacted for 30 minutes with a therapy dog and its handler. The dog handler provided general information about the dog and encouraged the subjects to talk about their own pets as the dog wandered freely about the room and interacted with the subjects. The therapeutic recreation group activities varied in content, including such things as music and art activities, education about how to spend leisure time, and education about community resources for leisure activities.

The state scale of the STAI was used to measure patient's levels of anxiety before and after each group session. Of those eligible for the study, 230 subjects completed pre-and posttreatment measures for at least one group activity, either animal-assisted therapy or a therapeutic recreation group. However, only 50 subjects completed both pre- and posttreatment measures for both types of sessions. The subjects were categorized according to diagnosis with categories consisting of mood disorders, psychotic disorders, substance use disorders, and all other disorders. Results showed a significant decrease in anxiety following the animal-assisted group treatment for subjects with mood disorders, psychotic disorders, and other disorders. Following a recreation group session, only subjects with mood disorders showed a significant decrease in anxiety scores. The authors concluded that animal-assisted therapy appears to offer anxiety reduction for a wider range of disorders than other types of therapeutic recreation.

The authors found no difference in anxiety change scores after subjects participated in AAT and after subjects participated in therapeutic recreation. They speculated that this lack of difference may have been due to the small sample size of subjects who completed both AAT and therapeutic recreation sessions. A power analysis demonstrated that 300 patients with psychotic disorders, 125 patients with substance use disorders, and 61 patients with other disorders would have been needed to achieve an 80 percent power level at an alpha of .05. The trend was for anxiety scores to be lower following AAT than recreation for individual subjects, so it is possible that between group differences do exist. Further research with larger sample sizes would be needed to detect these differences.

Another approach to looking at the effect of interaction with a therapy animal on anxiety was taken by Hansen, Messinger, Baun, and Megel (1999) who examined physiological arousal and behavioral stress in children undergoing medical examination with and without the presence of a dog in the examining room. Subjects were 34 children aged two to six years. Children were randomly assigned to a dog-present or dog-absent condition and physiological measures including systolic, diastolic, and mean arterial blood pressures, heart rate, and fingertip temperatures were measured prior to, during, and after the examination. Additionally, videotapes of the subjects during the exam were rated for behavioral signs of distress. Results showed statistically significant differences on behavioral measures of distress between groups, with the dog-present groups demonstrating less distress than the control group. Differences in physiological measures were not significant between groups, but the authors stated that these physiological

measures were found not to be good measures of arousal in this age group. These findings were similar to those of Nagengast, Baun, Megel, and Leibowitz (1997) who carried out a study using simulated physical exams in a laboratory setting; the findings suggest that companion animals may be useful in decreasing procedure-induced distress in children in a variety of health-care settings.

Similar studies were conducted to examine the effects of a companion animal on children undergoing dental procedures. Havener et al. (2001) studied 40 children, aged seven to eleven years, who were scheduled to undergo invasive dental procedures. Children were randomly assigned to either a dog-present or dog-absent condition. Peripheral-skin temperature was used as a physiological index of distress, with measures taken at the time the children were placed on the dental table and every five minutes thereafter. The children were also videotaped and rated for signs of behavioral distress, as well. The results of Havener et al. showed no significant differences between groups on any of the dependent measures. However, when the authors looked just at children who expressed prior fear of dental procedures, they did find significant differences between the dog-present and dog-absent groups, with the children showing significantly less physiological arousal when the dog was present. These findings were most apparent while the children waited for the procedure to begin. These results support the findings that interaction with a therapy dog is helpful for children during stressful medical or dental exams (Hansen et al., 1999; Havener et al., 2002; Nagengast et al., 1997) and suggests that similar effects may occur for adults.

Schwartz and Patronek (2002) conducted a similar study in an urban dental clinic. They did not find significant differences between dog-present and dog-absent conditions, and chose to publish a critique of their own methodology. They found that in their urban setting, fewer than 5% of children in the study had a dog at home, compared to over 50% of the subjects in similar studies (Hansen et al., 1999; Havener et al., 2001). The authors suggested that cultural differences in attitudes toward pets and the children's lack of familiarity with companion dogs led them to be uninterested or even fearful of the dog used in the study, which may have contributed to the lack of significant findings. The authors also cited other methodological issues including problems with the dependent measures chosen and variability in the dentists used and dental procedures the children underwent that may have interfered with the study. They concluded that there may be differences in what types of distress are amenable to animal-assisted therapy, and future research is needed that focuses on what type and degree of anxiety may be alleviated through the presence of an animal.

In exploration of a different population, Barker, Pandurangi, and Best (2003) examined the effects of interaction with a therapy animal on fear and anxiety in patients prior to receiving electroconvulsive therapy (ECT). A crossover design was used, with subjects serving as their own controls. Subjects were 35 individuals waiting to receive scheduled ECT treatments. Prior to their treatments, subjects experienced 15 minutes of interaction with a therapy dog and handler or were given magazines to look at for 15 minutes. All 35 subjects experienced both conditions. Subjects rated their anxiety, fear and depression before and after

interacting with the therapy dog or looking at the magazines. Subjects were also asked about their pet ownership status and asked to subjectively rate how helpful they found the therapy dog or the magazines.

Results showed a significant decrease in fear following interaction with a therapy dog compared to reading magazines. A decrease in anxiety was also shown, but results were not significant. There was no observed effect on depression. Additionally, nearly all of the subjects rated the therapy dog as helpful and a majority of them indicated they would like to see the dog again in the future. The authors concluded that AAT may be beneficial in psychiatric and medical therapies in which the therapy is inherently fear-inducing or has a negative societal connotation.

This study was somewhat limited by a small number of subjects, as well as the lack of a separate control group. Additionally, subjects were not randomly selected, so generalization is limited. By using a crossover design, the authors exposed all subjects to the AAT condition, with some subjects experiencing the AAT condition prior to the magazine condition and others the opposite. It is possible that exposure to the previous AAT condition may have affected subjects' ratings during the magazine condition, especially since many subjects asked about the dog at subsequent appointments and indicated a desire for further interactions. Additionally, the use of Visual Analog Scales (VASs) to assess the subjects' levels of anxiety, rather than a more sensitive measure such as the State scale of the STAI, might have missed some of the differences in anxiety experienced by the subjects, resulting in the insignificant findings for anxiety reduction.

Barker, Rasmussen, and Best (2003) exposed patients waiting for ECT to fish aquariums and assessed the effect on patient's fear and anxiety. Subjects were 42 patients referred for ECT who were randomly rotated between rooms with and without aquariums while waiting for their treatments. Self-report measures of anxiety, fear, and frustration were used along with measures of heart rate and blood pressure. Thirty-one subjects completed all measures under both the fish-present and fish-absent waiting conditions. Results did not demonstrate significant differences between conditions on any measure, but a trend toward significance was found for lower self-reported anxiety levels in the fish-present condition. Further analysis showed that, on average, subjects reported 12% less anxiety in the fish-present condition. Power analyses showed that twice as many participants would be needed to detect a statistically significant small effect. This suggests that active interaction and/or physical contact with a therapy animal may not be necessary to achieve some benefit. Other research has also demonstrated the potentially beneficial effect of fish aquariums to lower blood pressure in hypertensive patients (Katcher, Freedman, Beck, & Lynch, 1983) and to decrease stress levels in patients waiting for heart transplants (Cole & Gawlinski, 1995).

Cole, Gawlinski, Steers, and Kotlerman (2007) examined the effect of interaction with a therapy dog compared to visits from a volunteer person or no visits at all on self-reported anxiety levels and physiological measures of anxiety in patients hospitalized for heart failure. The study involved one 12-minute period where the subjects interacted with either a volunteer handler/dog team, a volunteer alone, or received usual care. Data were collected at baseline, at eight

minutes (midway through the experimental period) and at 16 minutes (after the visit).

Results showed that the volunteer-dog group demonstrated significantly greater decreases in blood pressure during and after the visit compared with the control group, and significantly greater decreases in epinephrine and norepinephrine levels during and after the visit compared to the volunteer-only group. After the intervention, the volunteer-dog group demonstrated a significantly greater decrease in state anxiety compared to the volunteer-only and control groups. The authors concluded that a brief animal-assisted therapy intervention improves cardiopulmonary pressures, neurohormone levels, and anxiety in patients with heart failure, and recommended further study into the potential of AAT interventions as a safe, inexpensive adjunctive therapy to address the emotional strain on persons hospitalized with heart disease.

CHAPTER III

METHOD

Participants

The participants in the present study were 141 undergraduate students enrolled in a general psychology course at a large university in rural western Pennsylvania. All students enrolled in general psychology were given the option to participate in the psychology department's subject pool or to read and review psychology journal articles to meet the course requirement for research participation. All students who opted to participate in the subject pool were pre-tested for eligibility to participate in the present study at the time they signed up for the subject pool. This pre-test (see Appendix D) was used to exclude participants who were afraid of dogs and those who were severely allergic to dogs. Participants were randomly chosen from the subject pool for participation in this study; all selected students who did not meet the exclusion criteria measured by the pre-test were included in the study.

Materials

Three measures were used to assess characteristics of the participants in the study. The Trait scale of the State Trait Anxiety Inventory (STAI-T; Spielberger, Gorusch, Lucene, Vagg, & Jacobs, 1983) was used to assess participants' levels of trait anxiety. The STAI-T is a 20-item measure of trait anxiety; the primary qualities evaluated by the STAI-T are feelings of apprehension, nervousness, tension, and worry. Individuals rate each item on a scale ranging from 1 (*not at all*) to 4 (*very much so*). Possible scores range from 20-80, with higher scores

indicating greater levels of anxiety. The STAI-T is a psychometrically sound measure. Internal consistency as measured by formula K-R 20 ranges from .86 to .92, and test-retest reliability coefficients are between .73 and .86, as would be expected of a measure assessing a stable personality trait (Spielberger & Vagg, 1984).

The degree to which the participants are generally anxious about public speaking was assessed using the Audience Anxiousness Scale (AAS; Leary, 1983). The AAS is a twelve-item scale designed to assess individuals' anxiety about situations in which their social responses are not contingent on the behaviors of others, such as giving a speech or acting in a play (Leary). For each item, individuals are asked to indicate "the degree to which the statement is characteristic or true of you" on a five-point scale ranging from 1 (*not at all*) to 5 (*extremely characteristic*). Scores range from 12-60, with higher scores indicating greater levels of anxiety. Reliability for the AAS is good, with a reported Chronbach's alpha of .91 and reported eight-week test-retest reliability of .84. The AAS is highly correlated with other measures of public speaking anxiety and correlated with general measures of social anxiety (Corcoran & Fisher; 1987; Leary).

Participants' feelings about pets were assessed using the Pet Attitude Scale (PAS; Templer, Salter, Baldwin, Dickey, & Veleber, 1981). The PAS is an 18-item scale designed to assess the favorableness of individuals' attitudes toward pets. Each item is rated on a 4-point Likert-type scale from 1 (*strongly disagree*) to 4 (*strongly agree*). Scores range from 18 to 72, with higher scores representing

more favorable attitudes toward pets. The PAS has demonstrated excellent internal consistency with a Chronbach's alpha coefficient of .93, and it has demonstrated a test-retest reliability coefficient of .92 (Templer et al., 1981).

The State scale of the State Trait Anxiety Inventory (STAI-S; Spielberger et al., 1983) was used as a dependent measure to assess participants' current levels of anxiety as the study proceeded. The STAI-S was administered to each participant at four points: at baseline (Time 1), following the introduction of the public speaking task (Time 2), following the waiting period (Time 3), and after the participant had delivered the required speech (Time 4). The STAI-S is a 20-item measure of state anxiety. The STAI-S has demonstrated sensitivity to changes in transient anxiety. Like the STAI-T, the primary qualities evaluated by the STAI-S are feelings of apprehension, nervousness, tension, and worry; however, the STAI-S assesses these feelings at the present moment, not as a general characteristic of the individual across situations. Individuals rate each item on a scale ranging from 1 (*not at all*) to 4 (*very much so*). Possible scores range from 20-80, with higher scores indicating greater levels of current anxiety. The STAI-S has been used extensively in clinical practice and research to assess levels of state anxiety provoked by laboratory induced and real-life stressors (Spielberger, & Vagg, 1984). The STAI-S demonstrates good internal consistency with K-R 20 formula coefficients between .83 and .92, but low test-retest reliability (.54 for 20 days; .27 for 104 days), as would be expected from a measure designed to assess transient emotional states (Hedberg, 1972).

Procedure

Study participants were chosen randomly through the psychology subject pool and contacted by e-mail and/or telephone to participate in the study. Upon initial contact, potential participants were told that some of the individuals involved in the study routinely bring their dogs to school with them and there was a possibility they might encounter the dogs. The potential participants were asked if they felt uncomfortable with the possibility of interacting with a dog for any reason including allergies or fear of dogs. Any subjects who indicated extreme discomfort with a dog were excluded from the study and assured that such exclusion would not be reported to the study pool as a decline to participate. The participants were told they were being asked to participate in a study about public speaking and scheduled to attend an experimental session. Participants were randomly assigned to one of three study conditions: the dog group, which experienced interaction with a therapy dog and a friendly person (handler), the person group, which experienced interaction with a friendly person, and the control group, which experienced no interactions with either a dog or person during the experimental period.

The dog and handler teams used in this study were volunteer therapy teams recruited from local therapy dog groups. All participating teams were registered with either the Delta Society or Therapy Dogs International. Only teams registered with these organizations were recruited to help ensure that the dogs were suitable for interaction with a variety of people, to minimize the risk of the dogs inflicting

injury, and to improve consistency across dog and handler teams due to their experience with animal-assisted therapy work. Additionally, these organizations provide liability insurance coverage for their teams, which would have been necessary should any unfortunate incidents have occurred. Six different therapy dog/handler teams participated in the study over the course of the three-month data collection period, representing five different breeds of dog (two English springer spaniels, one Shetland sheepdog, one Labrador retriever, one Portuguese water dog, and one Saint Bernard).

Prior to assisting with the present study, the dog handlers were provided with information via e-mail about the study's purpose and design and were given instructions about their roles and how they should interact with the participants. This information was reviewed and detailed instructions were provided prior to each team's initial participation in the study (see Appendix C). This helped to minimize differences in interactions between the participants and different dog/handler teams. At the same time, the inclusion of multiple dogs and handlers allowed for greater generalizability about the effects of interaction with therapy animals in general, as opposed to just one particular dog/handler team.

The confederates of the experimenter (the friendly persons) were two female and one male psychology graduate students who agreed to assist with the research. They were educated about the study's structure and purpose and given instructions for how to interact with the study participants (see Appendix B). Like the instructions to the therapy dog handlers, these instructions helped to standardize the participants' experience while the use of more than one friendly

person allowed for greater generalizability. Additional experimenters were also graduate students in psychology who volunteered to assist in recruiting subjects and conducting the experiment. These individuals received training in carrying out the study procedures to ensure uniformity (see Appendix A).

The experiment was conducted in the graduate student training clinic of the university's psychology department. The clinic consists of several individual therapy rooms, each of which contains a few chairs, a small table, a telephone, and a video camera and television monitor. When participants arrived at the experimental session they were escorted to an individual room by the primary researcher or another doctoral-level psychology student helping to conduct the experiment (both the primary researcher and the doctoral student research assistants are referred to as "the experimenter" in the study description). The experimenter explained to the study participants that they were being asked to participate in a study about public speaking ability. The participants were told that they would be asked to prepare and give a short speech. The experimenter pointed out the video camera and informed participants that their speeches would be videotaped, then the tape would be reviewed and the participants rated on their apparent composure, quality of speech delivery, and content of their speech during the public speaking task. Participants were then asked to sign a consent form (see Appendix E). Once they consented to participate, all participants were administered a brief demographics questionnaire (see Appendix F), the STAI-T, AAS, and PAS, as well as the STAI-S to assess baseline anxiety (Time 1). The demographics questionnaire, STAI-T, AAS, and PAS were administered only at

Time 1. The experimenter instructed the participants to complete these measures and then left the room for approximately ten minutes to allow for completion of the measures.

After the allotted time, the experimenter returned to the room and collected the completed forms from the participant. At that time all participants were given the following instructions: "Shortly, you will be asked to give a 5-minute speech. You will be provided 5 minutes to prepare a speech on the given topic, and then you will be asked to speak on this topic for 5 minutes. The topic of your speech will be 'what I dislike about my body and physical appearance.' You may use this paper to outline your speech or make notes. Do you have any questions?" Similar public speaking tasks have been shown to elicit significant stress responses, making them effective for inducing anxiety in a laboratory setting (Kassel & Shiffman, 1997; Steele & Josephs, 1988). The experimenter asked the participants if they had any questions and answered any inquiries. Participants were provided with a pencil and some blank paper. The experimenter told the participants that they were to begin preparing the speech, and that they would be informed when preparation time was over and they should begin delivering their prepared speech to the video camera. The experimenter then left the room, allowing the participant to prepare their speech.

For those participants in the dog group, after they were allowed five minutes to prepare their speech, a therapy dog team consisting of a dog handler and a therapy dog entered the room. The handler told the participants that he/she was one of the experimenters and introduced the dog by name, saying that it often

accompanies the handler to school and/or work. The therapy dog handler asked the participants to rate their current anxiety level by completing the STAI-S once again (Time 2). Once the participant completed the measure, the handler informed the participants that there had been a problem with the video equipment and the participants' speech would be delayed while the equipment was fixed. The handler explained that he/she had been asked to remain in the room to receive a call when the equipment was fixed and give the participants final instructions to begin the speech at that time. The dog and handler teams then spent 15 minutes in the room with the participants. The handler encouraged the participants to interact with the dog and engaged the participants in conversation. Conversation topics were wide-ranging, including school, the weather, participants' backgrounds and home-life, participants' pets and dogs in general, current events, and various other topics. Topics related to the purpose or procedures of the current study, anxiety in general, or public speaking were avoided by the handler and the conversation was redirected if the participant raised any of these issues. At the end of 15 minutes, the experimenter phoned the room and let the handler know the experimental period was over. The handler then informed the participants that the equipment was fixed and asked participants to assess their current level of anxiety by completing the STAI-S (Time 3). The handler instructed participants to face the camera and begin giving their speech once the handler had left the room.

For those participants in the person group, after they had five minutes to prepare their speech, a confederate of the experimenter entered the room and asked them to assess their current level of anxiety by once again completing the

STAI-S (Time 2). These confederates identified themselves as fellow researchers assisting with the study (as the therapy dog handlers had done in the dog group). After the participants completed the Time 2 measure, the confederate informed them that there had been a problem with the video equipment, and the participants' speech would be delayed while the equipment was fixed. The confederate said that he/she had been asked to remain in the room to receive a call when the equipment was fixed. The confederate remained in the room for 15 minutes. During that time, he/she engaged in conversation with the participants. These conversations were similar to those engaged in by the therapy dog handlers with participants, with the same limitations. At the end of 15 minutes, the experimenter called the room to let the confederate know the experimental period was over. At that time, the confederate asked the participants to once again rate their current level of anxiety by completing the STAI-S (Time 3). Following completion of the Time 3 measure, the confederate instructed the participants to face the camera and begin giving their speech once the confederate had left the room.

For those participants in the control group, after five minutes to prepare their speech, the experimenter entered the room and asked them to assess their current level of anxiety by once again completing the STAI-S (Time 2). After the participants completed the Time 2 measure, they were informed that there was a problem with the video equipment, and the participants' speech would be delayed while the equipment was fixed. They were told that someone would return to inform them when the equipment was fixed and the speech could proceed. At that

time, the experimenter left the room and the participants remained alone in the room for 15 minutes. At the end of 15 minutes, the experimenter returned to the room and asked the participants to once again rate their current level of anxiety by completing the STAI-S (Time 3). Following participants' completion of the Time 3 measure, the experimenter instructed the participants to face the camera and begin giving their speech once he/she had left the room.

None of the participants were observed while delivering their speeches. For participants in all three groups, after five minutes the experimenter returned to the room and instructed the participants to stop speaking. The participants were then asked to complete the STAI-S (Time 4) to assess post-speaking levels of anxiety. The participants were told that they performed well on all required tasks and thanked for their participation. They were provided with a debriefing form (see Appendix H) explaining that some information about the true purpose of the study was withheld because participants' ignorance of the true purpose was important to the integrity of the research. Participants were informed that they would be e-mailed a complete explanation of the purpose and methods of the study as well as a rationale for withholding information once the data collection was completed (see Appendix I). The debriefing form also provided resources for the participants to contact if they wanted assistance with any anxiety or other problems resulting from their participation in the study. The participants were asked to complete the post-study forms required by the university in order for students to receive credit for their participation. The thorough debriefing form (Appendix I) was e-mailed to all study participants on May 12, 2007, following completion of the data collection

phase of this study. Participants were informed at that time that they could contact the researcher at a future date to receive information about the study results, and were also provided with resources for additional information about animal-assisted therapy.

CHAPTER IV

RESULTS

One hundred forty-one participants were selected to participate in the study and began study participation. Six study participants opted to drop out of the study prior to completion. In all cases, this occurred when study participants were informed that they would be asked to deliver a speech and given their assigned speech topic. Data analyses included the 135 participants who completed the study. Of these, 87 (64%) were male and 47 (34%) were female (one participant did not report gender). The study participants reported a mean age of 19.41 years. The youngest participant was 18 years and the oldest was 28 years. All participants were undergraduate university students enrolled in a general psychology course. Of the participants, 106 (77%) reported owning one or more pets. Complete data was available for 126 study participants. For those cases with data missing, the missing data included age for seven participants, age and gender for one participant, and Time 4 data for one participant. For statistical analyses involving age or gender, the cases missing information were omitted from analysis. For analyses involving Time 4 data, the group mean for Time 4 STAI-S scores was substituted for the missing data.

Several predictions were made based on study hypotheses and these were tested through data analysis. The first study prediction stated that following the intervention (Time 3), individuals in the dog group would report significantly lower levels of anxiety than individuals in the person group, who would in turn demonstrate lower levels of anxiety than the control group. To test this hypothesis,

a two-way, 3 x 4, mixed ANOVA was calculated using the scores on the STAI-S as the dependent measure, where group (dog, person, or control) was the between-subjects variable and time (four points of data collection) was the within-subjects variable. Mauchly's test of sphericity was shown to be significant for this analysis ($p < .001$), so the Greenhouse-Geisser adjustment was made. Using the corrected degrees of freedom, no significant main effects were found for group, $F(2,128)=2.08$, $p=.129$, or time, $F(2.68,342.55)=.133$, $p=.925$. There was a significant group x time interaction, $F(5.35,342.55)=4.60$, $p < .001$. For this effect, observed power was .98 and partial eta squared was .07.

Post hoc univariate ANOVAs were used to test for differences between groups at each time point. When significant differences were found, comparisons based on estimated marginal means for each group at that time point were conducted to determine where the significant differences occurred. A Bonferroni correction was applied to these comparisons to minimize the probability of Type I error. No significant differences were found between groups at Time 1, $F(2,134)=.149$, $p=.862$; or Time 2, $F(2,134)=2.11$, $p=.13$. At Time 3, however, there was a significant difference observed, $F(2,134)=4.82$, $p=.01$. Further post hoc analyses demonstrated that participants in the dog group reported significantly lower levels of anxiety than participants in both the person group (mean difference = -5.45, $p=.02$), and the control group (mean difference = -4.78, $p=.04$). There was no significant difference in reported anxiety levels at Time 3 between the person group and the control group (mean difference = -.67, $p=1.00$). The univariate ANOVA conducted at Time 4 demonstrated potentially significant

differences between groups, $F(2,134)=3.14$, $p=.05$. However, further post hoc analyses with Bonferroni correction at this time point did not demonstrate significant differences between any of the groups, suggesting the barely significant results of the previous analysis were likely due to chance. A timeline of the study is reported in Table 1, to assist in clarifying what occurred at each data collection point. Estimated marginal means and standard deviations for STAI-S scores at each data collection point are reported for all groups in Table 2. The first part of prediction one, that individuals in the dog group would report significantly lower levels of anxiety than those in the other two groups following the intervention, was supported. The second part of this prediction, that individuals in the person group would experience lower levels of anxiety than those in the control group, was not supported.

The second prediction generated by the study stated that regardless of group condition, individuals would demonstrate increased anxiety following the presentation of the public-speaking task (Time 2) compared to baseline levels of anxiety (Time 1). Prediction three was that anxiety would continue to increase from Time 2 to Time 3 for the control group, but not for the person or dog groups. Prediction two was partially supported, in that post hoc analyses demonstrated that anxiety levels increased significantly for the control group and the person group between Time 2 and Time 3, but anxiety levels for the dog group did not demonstrate a significant increase from Time 2 to Time 3, and actually decreased slightly, although the change was not statistically significant (see Table 2). Additionally, prediction three was not supported, as reported anxiety levels

decreased for all three groups from Time 2 to Time 3, although this change was statistically significant only for the dog group (see Table 2).

Table 1. *Study Timeline*

	Description of Data Collection
Time 1	Baseline data collection, prior to introduction of speech assignment; administered by the experimenter
Time 2	After 5-minute speech preparation, prior to participants' being informed about supposed delay due to broken equipment; administered by different individuals for all groups (dog group: dog handler, with dog; person group: friendly person; control group: experimenter)
Time 3	After 15-minute delay/experimental intervention; administered by the same individuals who administered Time 2 measures
Time 4	After completion of 5-minute speech delivery period; administered by the experimenter

Table 2. STAI-S Estimated Marginal Means and Standard Deviations

	Time 1		Time 2		Time 3		Time 4	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Dog	38.64	1.17	38.36	1.27	34.35	1.33	32.98	1.16
Person	37.76	1.18	42.11	1.27	39.79	1.34	36.41	1.17
Control	38.33	1.19	41.01	1.29	39.61	1.35	32.66	1.18

Prediction four, that anxiety levels would decrease to at or below baseline for all groups at Time 4 was supported by post hoc analyses (see Table 2). A profile plot of the estimated marginal means for the three groups at each time point can be seen in Figure 1, to further illustrate the obtained results for the first four predictions.

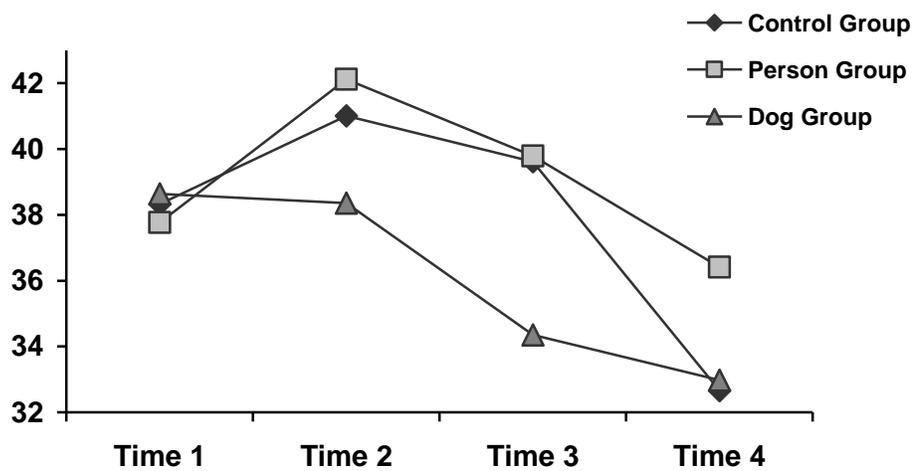


Figure 1. Estimated marginal means of STAI-S scores for each group.

The fifth prediction was that individuals with higher levels of trait anxiety, as measured by the STAI-T, would report higher levels of anxiety at all four measurement points than those with lower reported levels of trait anxiety. Prediction six stated that individuals who reported greater fear of public speaking as measured by the AAS would also report higher levels of anxiety at all times. These predictions were tested using multiple regression, with STAI-S scores at each data collection point as the dependent variable and STAI-T and AAS scores as the independent variables (see Table 3 for correlation matrices). A significant correlation was found for both variables at all four data collection points supporting both predictions. Standardized beta coefficients and significance levels for each data collection point are displayed in Table 4. Additionally, a significant correlation was found for all participants between trait anxiety and fear of public speaking. This was tested by calculating a Pearson correlation between STAI-T and AAS scores for all study participants. Results showed a significant correlation, $r = .33$, $p < .001$.

Prediction seven stated that individuals in the dog group who reported higher levels of trait anxiety and/or fear of public speaking would experience a greater decrease in anxiety as a result of interacting with a therapy dog than those who reported lower levels of anxiety/fear. This prediction was tested using multiple regression, with the change in STAI-S scores between Time 2 and Time 3 as the dependent variable and STAI-T and AAS scores as independent variables. This analysis was conducted only for the dog group. No significant correlation was found between levels of trait anxiety or fear of public speaking and change in

anxiety levels following interaction with the therapy dog, $R=.138$; $p>.05$. Thus, this prediction was not supported.

Table 3. *Correlation Matrices for Multiple Regression Performed at each of the Four Time Points, with STAI-T and AAS as Independent Variables, and STAI-S as Dependent Variable*

	Time 1			Time 2			
	STAI-T	AAS	STAI-S	STAI-T	AAS	STAI-S	
STAI-T	1.00	.33	.34	STAI-T	1.00	.33	.22
AAS	.33	1.00	.54	AAS	.33	1.00	.59
STAI-S	.34	.54	1.00	STAI-S	.22	.59	1.00

	Time 3			Time 4			
	STAI-T	AAS	STAI-S	STAI-T	AAS	STAI-S	
STAI-T	1.00	.33	.17	STAI-T	1.00	.33	.31
AAS	.33	1.00	.59	AAS	.33	1.00	.46
STAI-S	.17	.59	1.00	STAI-S	.31	.46	1.00

Table 4. *Correlations between Trait Anxiety/Fear of Public Speaking and State Anxiety*

		Time 1	Time 2	Time 3	Time 4
STAI-T	Beta	.34	.22	.17	.31
	Significance	.000	.001	.018	.000
AAS	Beta	.54	.59	.59	.46
	Significance	.000	.000	.000	.000

The final prediction generated by this study, that there would be no relationship between attitude toward pets and reported anxiety levels following interaction with a therapy dog, was tested by calculating a Pearson correlation to assess the relationship between scores on the PAS and the changes in score on the STAI-S from Time 2 to Time 3 for the participants in the Dog Group. The relationship was not significant ($r = -.17, p=.27$). A second Pearson correlation was calculated for PAS score and STAI-S score at Time 3, and this correlation was also not significant ($r = -.11, p=.46$). Thus, the prediction was supported.

CHAPTER V

DISCUSSION

The primary hypothesis, that individuals experience decreased anxiety following interaction with a therapy dog during a stressful situation was supported by the current study. Additionally, study results supported the hypothesis that interaction with a therapy dog results in greater anxiety reduction than interaction with a friendly person alone, supporting the idea that the anxiolytic effects are due to interaction with a therapy dog, not interaction with a person or a general distraction from thinking about the situation.

Previous research has suggested that interacting with a therapy dog may demonstrate an anxiolytic effect (e.g., Allen et al., 1991; Barker & Dawson, 1998; Cole et al., 2007; Hansen et al., 1991; Havener et al., 2001; Nagengast et al., 1991; Wilson, 1991). The current study supported these findings, as individuals who interacted with a therapy dog reported significantly lower levels of anxiety than those who did not. The current study expanded the results of previous research in several ways. No previously published research on AAT and anxiety has utilized a large, randomly selected sample along with random assignment to groups and the inclusion of a control condition. The use of a large sample allowed for adequate power to detect the significant effects of AAT that may have been missed in previous studies due to the small sample sizes typically used (e.g., Barker & Dawson, 1998). Furthermore, extraneous variables were carefully controlled to allow for causal inferences, which have been lacking from previous research.

The present study's demonstration of causal inferences about AAT advances knowledge about the effectiveness of AAT considerably. Based on the current results, it is possible to suggest that there is a causal relationship between interaction with a therapy dog and decreased levels of reported anxiety in a stressful situation. Thus, practitioners of animal-assisted therapy can more confidently state that interactions with animals do, in fact, cause a reduction in anxiety (and potentially other benefits that have been seen), rather than continuing to couch their findings in the cautious language of correlational relationships necessary in a field where serious research is still in its infancy. Of course, no individual study can prove or disprove a hypothesis; it can only lend support or fail to do so. However, the current results are very promising in lending support to existing hypotheses about the anxiolytic effects of AAT.

The use of three separate groups in the study not only addressed the limitations in attributing causality caused by lack of a control group seen in much of the previous research, but also allowed for differentiation between the effect of interacting with an animal compared to merely interacting with a person. Previous researchers have suggested the possibility that the observed benefits of interaction with a therapy animal come from interacting with the animal handler, not the actual animal (e.g., Hendy, 1987). There have been previous studies that have attempted to address this question by including a person-only interaction condition as the current study did. The results from this type of study have been mixed in terms of finding differences between dog-person and person-only groups, although the majority of these studies reported some additional benefits for the

group interacting with the dog. A second approach taken by researchers attempting to differentiate between benefits from interacting with a therapy animal and benefits from interacting with a person was to attempt to eliminate or minimize the influence of the handler. For example, Hendy (1987) had nursing home residents interact with pets alone, people and pets, and people alone, while Kaiser et al. (2002) included the dog handler in the room, but instructed the therapy dog handler not to interact with the study participants in any way as they interacted with the therapy dog. Neither of these studies demonstrated improvement in the dog-only condition compared to the others. It is worth noting, however, that the research in this area has focused almost exclusively on elderly populations in nursing homes, with a focus on the ability of AAT to improve mood, alleviate depression, or increase the number of observed positive behaviors in individuals. There remained a need to investigate the effects of interacting with a therapy team versus a person alone on other issues, such as anxiety, as in the current study.

The current study found significant differences between groups, with the group who interacted with the therapy dog/handler team reporting significant decreases in anxiety compared to the group that interacted with a friendly person without a dog. This lends additional support to the view that interaction with a therapy dog results in benefit beyond that which is seen from interacting with a person alone, at least for reported levels of anxiety. These results also lend support to the findings of similar studies assessing the effect of AAT on anxiety levels, such as Cole et al. (2007) who conducted a study with individuals hospitalized for heart failure, finding significantly lower levels of anxiety for those

interacting with a therapy dog and handler compared to those interacting with just a person, and to a “care-as-usual” control group.

An interesting finding in the current study was the difference in anxiety levels among the three groups at Time 2. It was expected that anxiety would increase significantly for all groups at Time 2 over anxiety levels at Time 1, and that the increase in anxiety would be similar across groups. This was the point at which the participants expected to make their speech, and previous research has reported that this is the point at which anxiety generally peaks in public speaking situations (Behnke & Sawyer, 2000). While the expected increase in reported levels of anxiety was seen in the person and control groups, no increase in anxiety (and actually a slight decrease, although the change was not significant) was reported at Time 2 for the dog group.

This finding has a possible explanation rooted in the study design. Although the study design attempted to make all participants’ experiences identical except during the actual intervention, Time 2 and 3 data were collected by different people for each group. For the dog group the measures were administered by the therapy dog handler. This meant that the therapy dog had already entered the room, and the participant had been introduced to the dog, before reporting their anxiety at Time 2. The dog group participants were briefly introduced to the dogs prior to completing the measure and the dogs remained in the room while the measure was completed. Because the only systematic variation among groups at Time 2 was the presence of the dog in the room at the time the measure was completed, the lower anxiety level in the dog group indicated the possibility that

the mere presence of the dog was already influencing the participants' anxiety levels by preventing the increase in anxiety seen in the other two groups. It is also possible that some variation in the characteristics of the experimental confederates acting as friendly persons compared to therapy dog handlers resulted in the lower levels of reported anxiety in the dog group compared to the person group at Time 2. In either case, this unexpected finding merits further consideration in future research, as it suggests the possibility that extremely brief exposure to a therapy dog/handler team, even with minimal or no actual interaction, can have measurable effects on subjective levels of anxiety for individuals in a stressful situation. Previous research has reported that as little as five minutes' interaction with a therapy dog is associated with significant decreases in physical measures associated with stress (Barker et al., 2005), but previous research has not looked at the effect of the mere presence of a dog, without participants' interaction with the therapy animal. There has also been no previous research attempting to assess differential characteristics of therapy dog handlers compared to other people, and if these individuals possess characteristics that somehow affect anxiety levels independent of the presence of their animals. The possibility that the mere presence of the dog (or dog/handler team) may have anxiolytic effects raises some interesting possibilities in terms of application of animal-assisted interventions, however, such as the potential benefit of the mere presence of a dog (or possibly another therapy animal) in the room during high-stress situations such as test-taking. Would, for example, SAT scores

be improved as test takers experienced decreased stress due to such an intervention? It is certainly an idea that merits further research.

Levels of reported anxiety for the control group remained the same from Time 2 to Time 3, rather than demonstrating the predicted increase. Failure to find the expected effect may have resulted from participants experiencing a sense of relief over having their speech delivery put off. Although anxiety levels may have increased as speech time approached once again, participants' anxiety may not have increased back to the previous level. Study participants may also have benefited from additional speech preparation time, thus decreasing their reported levels of anxiety. All three groups demonstrated a decrease in reported anxiety levels to at or below baseline following presentation of the speech, indicating that they all experienced relief at having completed the stressful task.

As hypothesized, individuals who reported higher levels of trait anxiety and/or greater fear of public speaking reported experiencing more subjective anxiety at all times. However, in contrast to the study prediction, these individuals did not report experiencing a greater decrease in anxiety following interaction with a therapy dog and handler than their less anxious or less fearful peers. Rather than having a differential effect, therapy dog interaction resulted in fairly uniform reduction in anxiety levels regardless of the participants' trait anxiety or fear of public speaking, indicating that it can be equally beneficial for all individuals.

The efficacy of AAT for all individuals was further supported by the finding that, as predicted, attitude toward pets did not appear to influence the effectiveness of interacting with a therapy dog. Although it might seem logical that

individuals who enjoy animals would derive greater benefit from interacting with them, the current study results did not support such a view. This is consistent with previous findings that have shown no differential effect for individuals reporting different levels of affection toward animals, such as Barker et al. (2003).

In the current study, participants were unaware that the dog with whom they were interacting was a therapy animal and that the purpose of the interaction was to decrease the participants' anxiety. This design was used to eliminate possible placebo effects based on expectations about interacting with a therapy animal. Previous research in the area has not specifically addressed the possibility that observed benefits of therapy animal interaction might be due to the expectation that a "therapy" animal should result in some benefit, although many studies do not make clear what, if anything, participants were told about the nature of the animal and the purpose of interaction. The fact that participants in the current study reported decreased anxiety levels in the absence of any knowledge about the nature of the dog or the purpose of the study suggests that the benefits of therapy dog interaction do not result solely from expectation effects.

Applications of Animal-Assisted Therapy

There are a variety of settings for the use of therapy dogs in ways similar to that explored in the current study. Results of the current study indicate that interaction with a therapy dog could prove useful in alleviating some of the anxiety experienced by individuals exposed to temporary stressful situations. Potential locations could include before or during doctor or dentist appointments, where interaction with therapy dogs has previously shown some evidence of being

effective (e.g., Hansen et al. 1999; Havener et al., 2001). Another possible area of application is hospital waiting rooms, where some hospitals have invited therapy dog and handler teams to be present in the room to interact with individuals whose loved ones are in surgery. This is a highly stressful time, and anecdotal reports suggest that individuals may experience comfort and decreased anxiety through interaction with therapy animals. Studies in this particular setting are certainly warranted, and findings from the current study are quite promising in suggesting this might be an effective area of intervention. Additional possibilities that warrant further exploration might include test-taking situations, courtrooms, or even places such as motor vehicle departments where long waits may lead to frustration and stress.

In the mental health field, the issue of costs versus benefits is always an important one when deciding which interventions to implement. AAT has demonstrated itself to be relatively cost-effective. Many professionals utilize their own therapy animals at no additional cost to the consumers or agencies with whom they work. When the professional does not have a therapy animal of his or her own, the animal/handler teams that are involved are generally volunteers who donate their time. Consequently, the costs associated with incorporating therapy animals into treatment are minimal. The dog and handler teams utilized in the current study were community volunteers, and the results of the study suggest that these volunteer teams can be effective. Because of the low cost, minimal risk, and potential benefit, AAT is a therapy that could be implemented frequently.

Limitations of the Study

Although every effort was made to design and implement effective research, the current study does have some limitations. First, the study participants, although randomly selected from the available pool, came from a fairly limited population, all being students enrolled in general psychology at a large university in a rural setting. Age distribution was fairly limited, and because the university does not have a particularly diverse population, the lack of diversity in the sample limits the generalizability of the study findings. Additionally, there may be characteristics peculiar to the student body of the university that influenced the study results. For example, many of the students at this university grew up in small towns or rural areas where it is common to own multiple pets. The majority of students reported owning pets, and the sample as a whole reported overwhelmingly positive attitudes toward pets as measured by the PAS. These characteristics may have played a part in the observed effect of interacting with the therapy dog. The study results indicated that attitude toward pets did not influence how individuals responded to interaction with the therapy dog. However, there may not have been enough variation in the participants' attitude toward pets to allow detection of such an effect.

Results of the current study may also have been influenced by attrition within the sample. Several participants declined to continue with the study when they were informed they would have to deliver a speech. Presumably, those individuals who refused to continue the experiment are the ones who would experience the greatest levels of anxiety under the study conditions. It is possible that these

individuals may have been too anxious to derive benefit from interacting with a therapy animal; alternatively, they may have benefited the most. In either case, excluding them from participation may have skewed the study results.

Another limitation may be the method used to induce anxiety in the study participants. Giving a speech to a video camera may not have influenced anxiety levels as much as being asked to deliver a speech to an actual audience, and therefore might not have been the most effective way of inducing anxiety. More effectively induced anxiety may have resulted in greater overall changes in anxiety levels, thus influencing the study results. Additionally, although public speaking is a very stressful activity for many, it may not be analogous to other situations--even anxiety-provoking ones--and it may differ considerably from other types of anxiety, particularly that experienced by clinical populations. This further limits the generalizability of the study results.

Only one dependent measure was used. Although it is psychometrically sound and has been effectively used in similar research situations, the study might have benefited from inclusion of additional measures, such as Visual Analogue Scales or additional self-report measures of current anxiety levels. Additionally, not all of the items on the STAI-S are necessarily applicable to any given situation, and therefore may not have changed during the experiment, thus affecting the study results. Some participants questioned some of the items, and expressed that they were unsure how to answer them, especially when asked to answer repeatedly over a short period of time. There may have been a more specific measure that could have been employed in addition to the STAI-S. Additionally,

only self-report data was used, leaving the results subject to any reporting biases the students may have demonstrated. The use of objective measures, such as physiological measures of stress response or behavioral observation of signs of tension in addition to self-report measures might have strengthened the study findings. Overall, the fact that the current study resulted in significant findings supporting the effectiveness of AAT in spite of the limitations discussed here, suggests that interaction with a therapy dog does alleviate anxiety in a stressful situation, and further research into this and other aspects of AAT is warranted.

The differences in reported anxiety levels between the person and control groups compared to the dog group at Time 2 suggests some methodological issues with the study, as well. As discussed previously, the presence of the dog in the room when Time 2 data were collected may have influenced participants' reported anxiety levels. Because separate individuals were used in the role of friendly people, there is also the possibility that some systematic difference between the therapy dog handlers and the individuals who acted as friendly persons might account for the difference in reported anxiety levels. To address these issues, similar research conducted in the future should attempt to ensure that pre-intervention data collection take place prior to any introduction of the therapy animal. Additionally, having therapy dog handlers without their dogs perform the role of friendly persons would eliminate any concerns about differences between people possibly accounting to variations in reported anxiety levels between groups.

Directions for Future Research

There are several areas for further research suggested by the current study. Additional well-controlled, quantitative studies are needed to continue exploration of the effectiveness of AAT in treating anxiety, as well as other areas where its efficacy has been suggested by previous research. Such studies could provide further evidence of the causal relationship between AAT and its observed benefits. Similar studies looking at the effect of AAT on anxiety could be conducted with more diverse samples and incorporate additional measures of anxiety, such as observational and physiological measures. Additional research addressing anxiety in other stressful situations such as hospital waiting rooms, court rooms, or test-taking situations is also warranted. Because the field is still lacking in well-controlled experimental designs, it is important to focus on studies that employ rigorous methodology with a variety of populations or in different settings, rather than continuing to accumulate studies with less scientific validity.

As the studies supporting the effectiveness of AAT continue to accumulate, an area of focus for future research is the mechanism of action for AAT's beneficial effects. Odendaal (2000) has speculated that the benefits of interacting with therapy animals are primarily physiological in nature. While there is ample research to support that specific physiological changes accompany interaction with a therapy animal, additional research designed to assess the exact nature of the relationship between these physiological changes and the emotional effects of AAT is needed. Studies designed to explore whether other activities that cause similar physiological responses result in similar decreases in anxiety or if the

subjective experience of interacting with an animal differs despite similar physiological effects would be important. Some of this research has occurred previously (e.g., Wilson, 1991; Odendaal, 2000), but additional research in this area with rigorous methodology and large samples is warranted.

Another area for future exploration is the nature of specific AAT interventions and their relative effectiveness. For example, research could be conducted comparing the relative benefits of differing amounts of time spent interacting with a therapy animal in a single session or differential effects of one versus multiple sessions. Previous research (e.g., Barker et al., 2005), as well as the current study, suggests that benefits can result from very brief interactions with a therapy animal, but there is need for clarification of whether additional interaction time results in increased benefit, or if there is a point at which maximum benefit is reached. Such information would prove very helpful in planning AAT interventions, helping to achieve the desired benefit without spending unnecessary time on additional interaction that may not improve the received benefits.

This is certainly not an exhaustive exploration of the possibilities for future research, but addresses some of the needs for further research highlighted by the current study. The field of AAT is a dynamic and exciting one, with great potential and a need for ongoing empirical validation of long-observed effects. As the current study demonstrates, interaction with a therapy animal holds great potential for reducing the subjective anxiety of individuals who find themselves in stressful situations. Additional research has demonstrated the potential of AAT in other areas, as well. Given its relatively low risk, low cost, and high potential for benefit,

animal-assisted therapy is something that mental health professionals should consider incorporating into their repertoire of available interventions.

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APPENDIX A

Instructions for Experimenter

1. When participants arrive, place them in one of the study rooms.
2. Go over informed consent form. Be sure to explain this is a study about public speaking and anxiety, and that they must give a speech, and that the speech will be videotaped. Point out the location of the video camera. Tell participants the videotaped speeches will be reviewed and the participant will be rated on their apparent composure, quality of speech delivery, and the content of the speech. Emphasize that their data will not be associated with their name, and tell them any videotapes will be destroyed at the conclusion of the study.
3. Be sure to get participant's signature on the consent form. Place signed consent form into the "consent" folder when you are finished giving instructions. Give the Informed Consent form (the one without a signature line) to the client to keep.
4. Provide the client with a pencil, and explain the instructions for completing the Time 1 measures. These include the Trait Scale of the STAI (form Y2), the AAS, the PAS, a demographics form, and the State scale of the STAI (form Y1). Ask the client to complete all the measures and to be completely honest. Tell them NOT to put their names or other info on the forms, even though there are lines that say Name for the STAI forms. **IMPORTANT:** Be sure to emphasize to the client when completing the TRAIT scale of the STAI (the first measure in the packet) to answer based on how he/she GENERALLY feels, meaning most of the time. When they get to the STATE scale (after the demographics form) to answer how they feel RIGHT NOW. Emphasize the importance of answering based on their feelings at this particular moment, not earlier today, or in general, or even five minutes ago. Let them know that they will be asked to complete that particular form again later, and they must always answer based on CURRENT feelings.
5. When all T1 measures have been completed, collect the forms. Allow the participant to keep the pencil and provide a few sheets of blank paper to use for notes when preparing the speech. Then give the following instructions VERBATIM: "Shortly, you will be asked to give a 5-minute speech. You will be provided 5 minutes to mentally prepare a speech on the given topic, and then you will be asked to speak on this topic for 5 minutes. The topic of your speech will be 'what I dislike about my body and physical appearance.' You may use this paper to outline your speech or make notes. Do you have any questions?" Answer any questions the participant may have, and then say "go ahead and begin preparing your

speech. Someone will come in to tell you when your preparation time is over and you should begin delivering the speech.” Then leave the room.

6. After 5 minutes, direct the therapy dog team or the friendly person into the room to perform their part of the experiment. For the control group, enter yourself and inform the subject that the time is up and ask them to complete the T2 STAI State scale. Once it is completed, inform the participant that there have been some technical problems with the video equipment, which is being repaired. Apologize for the delay, and ask that he/she remain in the room until you return to instruct them that the problem is fixed and they can deliver their speech, and then leave the room again.
7. For Dog and Person groups, after 15 minutes, phone into the room to instruct the handler or the friendly person that 15 minutes is over. For the control group, after 15 minutes, return to the room, again apologize for the delay, and ask the subject to complete the T3 STAI State scale. When they have finished, inform them that the equipment is fixed, and that as soon as you leave the room they should begin delivering their speech to the camera. Instruct them that they should continue speaking until you return to inform them that 5 minutes are over.
8. For all groups, after the subjects have had five minutes to deliver their speech, return to the room, and ask them to complete the T4 STAI State scale. Once they are done, thank them for their participation, provide the Debriefing form (subject should keep this) and explain its contents. Do not provide any additional info about the study, beyond what is on the debriefing form, but emphasize that a full disclosure will be made via e-mail in May. Ask the subject to provide his/her e-mail address, and add it to the e-mail list, so that we will have a complete list to send out at the end of the semester.
9. Provide the subjects with the yellow form from the subject pool, and instruct them to complete it after they have left, and return it to the subject pool office or place it in a campus mail pickup location. Thank them again for their participation, and escort them back to the waiting room.
10. Get the next subject, and start all over!

APPENDIX B

Instructions for “Friendly Person”

You will be role playing an experimenter, while actively engaging the subjects in friendly conversation for a 15 minute period. When you are instructed to enter the room, do the following.

1. Introduce yourself by name and say you are one of the experimenters. Ask the participants to complete the T2 STAI State scale (you will be given this form to give them). Instruct them NOT to put their names on the form, and remind them they will only be identified by number. Remind them that they are to answer the questions based on how they feel AT THIS MOMENT. When they have finished, collect the form.
2. After you have the form back, inform the participants that there have been some technical problems with the video equipment, and there will be a delay while it is repaired. Tell them they will be giving their speech as soon as the equipment is fixed. Inform them that you have been asked to remain in the room to receive further instructions by phone.
3. You will be in the room at this point for a set 15 minutes. This is the most vital part of the study. During this time, you should make casual, friendly conversation with the participant. You should be friendly and listen to what they have to say, but remember, you are not doing therapy. Try to avoid talking about the actual experiment or the participant’s actual speech. Also, do not talk specifically about anxiety or stress reduction. Any other topics are fine.
4. After 15 minutes, the phone will ring. Answer it. Just saying “hello” is fine. The experimenter will let you know the time is up. At that point, you should ask the participants to complete the T3 STAI State scale. Remind them to answer based on how they feel right now. When they have finished, collect the form from them.
5. Inform the client that the equipment is fixed, and they may now deliver their speech to the video camera as soon as you have left the room. Instruct them to continue speaking for the full five minutes, and let them know someone will come to stop them when the time is up. Give a polite goodbye (something along the lines of I enjoyed chatting with you) and leave the room.

APPENDIX C

Instructions for Therapy Dog Handlers

Thank you for your help with this study! Because of the nature of the study, it is important that the subjects not be aware that you and your dog are a therapy team, so you will have to engage in a bit of role playing. Your job will be to pretend you are one of the experimenters, and that you regularly bring your dog to school with you. This means you will also have to perform some of the duties of an experimenter. When you are instructed to enter the room with the study participant, please do the following.

6. Introduce yourself and your dog. Say something like, “Hi, I’m (your name), one of the experimenters, and this is (dog’s name). He/she usually comes to work with me and gets to meet lots of new people.”
7. Ask the participants to complete the T2 STAI State scale (you will be given this form to give them). Instruct them NOT to put their names on the form, and remind them they will only be identified by number. Remind them that they are to answer the questions based on how they feel AT THIS MOMENT. When they have finished, collect the form.
8. After you have the form back, inform the participants that there have been some technical problems with the video equipment, and there will be a delay while it is repaired. Tell them they will be giving their speech as soon as the equipment is fixed. Inform them that you have been asked to remain in the room to receive further instructions by phone.
9. You will be in the room at this point for a set 15 minutes. This is the most vital part of the study. During this time, you and your dog should engage with the participant the way you normally would engage with someone on a therapy visit. Make casual conversation, and encourage them to interact with the dog. Encourage as much interaction with the dog as you normally would on a therapy visit. Try to avoid talking about the actual experiment or the participant’s actual speech, however. Also, do not talk specifically about anxiety or stress reduction. Any other topics are fine.
10. After 15 minutes, the phone will ring. Answer it. Just saying “hello” is fine. The experimenter will let you know the time is up. At that point, you should ask the participants to complete the T3 STAI State scale. Remind them to answer based on how they feel right now. When they have finished, collect the form from them.
11. Inform the client that the equipment is fixed, and they may now deliver their speech to the video camera as soon as you have left the room. Instruct them to continue speaking for the full five minutes, and let them know

someone will come to stop them when the time is up. Allow them to say goodbye to your dog if they like, give a polite goodbye yourself (something along the lines of I enjoyed chatting with you) and leave the room.

APPENDIX D

Pre-test for Study Participants

Student ID #: _____

Please answer the following questions:

I have an allergy to dogs: Y N

If you answered yes, please rate the intensity of your allergy from 1-10, where 1 is very mild and 10 is extremely severe.

1 2 3 4 5 6 7 8 9 10

If you answered yes, please briefly describe the severity of your allergy (what happens when you come in contact with a dog):

I am afraid of dogs: Y N

If you answered yes, please rate the intensity of your fear from 1-10, where 1 is very mild and 10 is extremely intense:

1 2 3 4 5 6 7 8 9 10

If you answered yes, please briefly describe the severity of your fear (what happens when you encounter a dog; are there any dogs you are comfortable with):

APPENDIX E
Informed Consent

You are invited to participate in this research study, which is being conducted as a doctoral project at IUP. The following information is provided in order to help you to make an informed decision about whether or not to participate. If you have any questions, please do not hesitate to ask the researcher. You have been randomly chosen from the psychology subject pool to participate in this study.

The purpose of this study is to examine relationship between public-speaking and anxiety. The researcher is interested in whether a particular public-speaking task will cause participants to feel anxious and if that anxiety is affected by a general tendency toward anxiousness or a fear of public speaking.

Participation in this study entails preparing and presenting a short speech on an assigned topic. The speech will be videotaped and your performance will be rated for the level of anxiety you appear to be experiencing and your ability to speak with composure under pressure. You will also be asked to complete several self-report measures related to anxiety, fear of public speaking, and other information that may be relevant to the study. Study participation should require no more than one hour. You will receive research participation credit for your general psychology class for each hour or part of an hour you spend participating in this study.

Your participation in this study is voluntary. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators, with IUP or your psychology professor. If you choose not to participate, your name will be returned to the subject pool and your research participation obligation will remain the same. If you choose to participate, you may withdraw at any time by notifying the researcher. Upon your request to withdraw, all information pertaining to you will be destroyed. If you choose to participate, all information will be held in strict confidence. The information obtained in this study may be published in scientific journals or presented at scientific meetings but your identity will always be kept strictly confidential.

This research is sponsored by the Indiana University Department of Psychology.

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If you are willing to participate in this study, please sign the statement below. If you choose not to participate, please inform the researcher now.

I have read the information above, understand that participation in this study is voluntary and agree to be a part of this research:

Signature

Date

APPENDIX F

Demographic Questionnaire

Please answer the following questions:

Age: _____

Gender: M F

Class Level: Freshman Sophomore Junior Senior

Do you own any pets? Y N

If yes, please specify how many and what type(s):

APPENDIX G

State Trait Anxiety Inventory, Trait Scale

SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

Name _____ Date _____

DIRECTIONS

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you generally feel.

ALMOST NEVER
SOMETIMES
OFTEN
ALMOST ALWAYS

- 21. I feel pleasant 1 2 3 4
22. I feel nervous and restless 1 2 3 4
23. I feel satisfied with myself 1 2 3 4
24. I wish I could be as happy as others seem to be..... 1 2 3 4
25. I feel like a failure 1 2 3 4
26. I feel rested 1 2 3 4
27. I am "calm, cool, and collected" 1 2 3 4
28. I feel that difficulties are piling up so that I cannot overcome them 1 2 3 4
29. I worry too much over something that really doesn't matter..... 1 2 3 4
30. I am happy 1 2 3 4
31. I have disturbing thoughts 1 2 3 4
32. I lack self-confidence 1 2 3 4
33. I feel secure 1 2 3 4
34. I make decisions easily 1 2 3 4
35. I feel inadequate 1 2 3 4
36. I am content..... 1 2 3 4
37. Some unimportant thought runs through my mind and bothers me..... 1 2 3 4
38. I take disappointments so keenly that I can't put them out of my mind..... 1 2 3 4
39. I am a steady person 1 2 3 4
40. I get in a state of tension or turmoil as I think over my recent concerns and interests..... 1 2 3 4

APPENDIX H

Audience Anxiousness Scale

Please indicate the degree to which each statement is characteristic or true of you using the following scale:

1. Not at all characteristic
2. Slightly characteristic
3. Moderately characteristic
4. very characteristic
5. Extremely characteristic

- _____ 1. I usually get nervous when I speak in front of a group.
- _____ 2. I enjoy speaking in public.
- _____ 3. I tend to experience “stage fright” when I must appear before a group.
- _____ 4. I would be terrified if I had to appear in front of a large audience.
- _____ 5. I get “butterflies” in my stomach when I must speak or perform before others.
- _____ 6. I would feel awkward or tense if I knew someone was filming me with a video camera.
- _____ 7. My thoughts become jumbled when I speak before an audience.
- _____ 8. I don’t mind speaking in front of a group if I have rehearsed what I am going to say.
- _____ 9. I wish I did not get so nervous when I speak in front of a group.
- _____ 10. If I was a musician, I would probably get “stage fright” before a concert.
- _____ 11. When I speak in front of others, I worry about making a fool out of myself.
- _____ 12. I get nervous when I must make a presentation at school or work.

APPENDIX I

Pet Attitude Scale

Please indicate the degree to which you agree with each of the following statements using the following scale:

1. Strongly Disagree
2. Disagree
3. Agree
4. Strongly Agree

- _____ 1. I really like seeing pets enjoy their food.
- _____ 2. My pet means more to me than any of my friends (or would if I had one).
- _____ 3. I would like a pet in my home.
- _____ 4. Having pets is a waste of money.
- _____ 5. Housepets add happiness to my life (or would if I had one).
- _____ 6. I feel that pets should always be kept outside.
- _____ 7. I spend time playing with my pet every day (or would if I had one).
- _____ 8. I have occasionally communicated with a pet and understood what it was trying to express.
- _____ 9. The world would be a better place if people would stop spending so much time caring for their pets and started caring more for other human beings instead.
- _____ 10. I like to feed animals out of my hand.
- _____ 11. I love pets.
- _____ 12. Animals belong in the wild or zoos, but not in the home.
- _____ 13. If you keep pets in the house you can expect a lot of damage to the furniture.
- _____ 14. I like housepets.
- _____ 15. Pets are fun but it's not worth the trouble of owning one.

_____ 16. I frequently talk to my pet (or would if I had one).

_____ 17. I hate animals.

_____ 18. You should treat your housepets with as much respect as you would a human member of your family.

APPENDIX J

State Trait Anxiety Inventory, State Scale

SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-1

Please provide the following information:

Name _____ Date _____ S _____

Age _____ Gender (Circle) M F T _____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right now*, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

NOT AT ALL
SOMEWHAT
MODERATELY SO
VERY MUCH SO

- 1. I feel calm 1 2 3 4
- 2. I feel secure 1 2 3 4
- 3. I am tense 1 2 3 4
- 4. I feel strained 1 2 3 4
- 5. I feel at ease 1 2 3 4
- 6. I feel upset 1 2 3 4
- 7. I am presently worrying over possible misfortunes 1 2 3 4
- 8. I feel satisfied 1 2 3 4
- 9. I feel frightened 1 2 3 4
- 10. I feel comfortable 1 2 3 4
- 11. I feel self-confident 1 2 3 4
- 12. I feel nervous 1 2 3 4
- 13. I am jittery 1 2 3 4
- 14. I feel indecisive 1 2 3 4
- 15. I am relaxed 1 2 3 4
- 16. I feel content 1 2 3 4
- 17. I am worried 1 2 3 4
- 18. I feel confused 1 2 3 4
- 19. I feel steady 1 2 3 4
- 20. I feel pleasant 1 2 3 4

APPENDIX K

Debriefing Form

An Examination of the Anxiolytic Effects of Interaction with a Therapy Dog

Thank you for your participation in this study.

At the beginning of this study, you were informed that the purpose of the study was to examine the relationship between anxiety and public-speaking. The actual purpose of this study is to determine what effect interaction with a therapy dog/handler team has on anxiety during a stressful task, compared to interaction with a friendly person or no interactions with either. The use of animals in therapeutic ways has become increasingly popular over the past two decades, but more research is needed to determine what effects, if any, interaction with a therapy dog may have and how strong those effects might be. Additionally, it is important to separate the effect of having an animal present from the effect of interacting with a friendly person, since the therapy dog's handler is always present during interventions involving therapy animals.

The assigned public-speaking task was used to deliberately increase participants' anxiety, and the focus of the study was actually on whether or not anxiety decreased during the delay before the speech was given depending on the condition to which participants were assigned. The 15-minute delay before the delivery of the speech was planned (there was no actual equipment failure) and used to allow participants to experience one of the experimental conditions designed to influence their levels of anxiety. The speeches that participants were asked to deliver were not actually videotaped and participants were not observed while delivering their speeches.

When you were chosen to participate in this experiment, you were randomly assigned to one of three conditions:

1) Interaction with a therapy dog/handler team: Individuals in this condition experienced interaction with a registered therapy dog and the dog's handler during the time when speech-giving was supposedly delayed. The dog handlers involved are not actually researchers; they are volunteers from the community who, along with their dog, have received certification from a national agency to act as a therapy animal team.

2) Interaction with a friendly person: Individuals in this condition experienced interaction with a friendly person during the time when speech-giving was supposedly delayed. The person who delivered the information about the broken video equipment and remained in the room was a confederate of the researcher whose purpose was to interact with the participants during the delay in the same way the therapy dog handler interacted with participants in the first group. The only difference between these conditions was the presence or absence of the therapy dog.

3) Control group: This group did not experience interaction with the therapy dog/handler team or a friendly person during the delay. This group was left alone in their room during this time. The purpose of the control group is to allow the researchers to see what happens to anxiety levels when there is no intervention during the waiting period to allow for comparison with the other two groups.

The deception used in this study was necessary to ensure that study participants were unaware that they may be interacting with a therapy dog to decrease their anxiety about the upcoming speech. Awareness of the purpose of the study might have influenced participants' reporting of their anxiety or their response to the presence of the dog or the friendly person. Withholding information about the true purpose of the study from participants increases the likelihood of discovering true effects for interaction with the dog and/or the friendly person, should they exist.

It was important that participants think that the speeches they were giving were going to be videotaped and evaluated in order to increase participants' anxiety enough for the effects of the therapy dog or other groups to be observed. Information about the true purpose and methods of this study was withheld until the researchers finished collecting all the study data to ensure that future participants did not learn about the purpose of the study prior to their participation.

If you would like to learn more about animal-assisted therapy, please visit the following website: www.deltasociety.org.

If you have any questions or would like further information about this study, including results when the study has been completed, please contact the following individuals:

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Appendix L

Mean Differences and p Values for Nonsignificant Post Hoc Analyses

STAI State Scale Time 1

(I) Group	(J) Group	Mean Difference (I-J)	Sig (p value)
Control	Person	.161	1.00
Person	Dog	-.886	1.00
Dog	Control	.705	1.00

STAI State Scale Time 2

(I) Group	(J) Group	Mean Difference (I-J)	Sig (p value)
Control	Person	-1.61	1.00
Person	Dog	3.76	.12
Dog	Control	-2.15	.72

STAI State Scale Time 4

(I) Group	(J) Group	Mean Difference (I-J)	Sig (p value)
Control	Person	-3.75	.08
Person	Dog	3.43	.12
Dog	Control	..32	1.00