Abstract

Though there is an expanding focus on the beneficial role of pets in the fields of nursing and veterinary medicine, the social sciences have been behind in paying attention to the significant role that pets play in human lives. Much has been made of findings that pet dogs may have a significant impact on physiological measures of health. However, dogs have also been associated with psychological measures of well-being, both through animal-assisted therapy and in the general population of dog owners. Whether the mechanism is touch, exercise, attachment, nonevaluative social support, or some combination of these, the human connection to the non-human animal world merits further investigation. Previous results have been mixed, and studies suffer from a lack of large sample sizes or sufficient control conditions, among other weaknesses.

The current study attempts to address some of the gaps in the literature by assessing the impact of the presence of pet dogs on their owners' responses to a negative mood induction procedure. Controlling for dog ownership as well as for the presence of the dog, and collecting demographic information from each participant in addition to measures of self-esteem, depression, social support, attitudes towards pets, and attachment to pets, this study found that among single female dog owners, positive attitudes towards animals were associated with positive mood prior to the mood induction. In addition, dog owners accompanied by their dogs experienced significantly lower despondency scores compared to non-owners prior to the mood induction. However, the presence of a pet dog was associated with *increases* in anxiety and apprehension subsequent to the mood induction, suggesting the importance of considering contextual factors when evaluating the emotional benefits of dog ownership.

Emotional Benefits of Dog Ownership:
Impact of the Presence of a Pet Dog on Owners' Responses to Negative Mood Induction

by

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May 2009

Submitted to the New School for Social Research of the New School in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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Acknowledgments

I would like to thank Dr. Eric Jones at Mary Baldwin College and Dr. Laura Massa at Loyola Marymount University for their help with the nonparametric statistical analyses of my data.

I would like to thank the Security department of the New School for allowing dogs into the building for my study, and the staff of Central United Methodist Church for allowing me to use their meeting rooms and also permitting dogs in their building.

Special thanks are due to my committee members, particularly my committee chair Dr. Joan Miller, and to Dr. Marcel Kinsbourne, Dr. Michael Schober, and Dr. Jim Miller as the Dean's Representative.

Thanks to my family, to my parents and especially to John for patience and support throughout the research, data analysis, and writing process.

This dissertation is dedicated to all my participants and their dogs, and to the companion animals in my life, both past and present.

for Pooh, Pookie, Sassy, Krishna, and Missy

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"There's just something about dogs that makes you feel good. You come home, they're thrilled to see you. They're good for the ego."

-Janet Schnellman

Introduction

As popular wisdom has it, a dog is "man's best friend." Dogs have certainly played a role writ large in the history of human domestication of nonhuman animals, with their presence as human companions going back not merely centuries, but millennia. As Peter Messent and James Serpell (1981) point out, archeological evidence of domestication only suggests when humans began to feed and care for their canine companions, taking on a more active role in the selective breeding process that has brought us the many specialized breeds and the characteristics of childlike playfulness and loyalty that many dog owners so value in their pets today. Skeletal remains suggest that the wolflike ancestors of *Canis familiaris* lived alongside our own early human ancestors possibly as long as 500,000 years ago, a much longer history than any have suggested for other domesticated animal companions such as the cat or the horse. So the question to be asked is what characteristics of dogs and the people who have shared their lives since prehistoric times have contributed to such a long-lasting bond.

Socially, domestic dogs have a tendency to "acknowledge the dominant status of humans" (Messent & Serpell, 1981, p. 14), and dogs also use a variety of means to communicate nonverbally that their owners can respond to and attribute emotional meaning to. Dogs also tend to be playful, and are relatively high in intelligence, as well as being active during the day and generally responding well to house-training. Over

time, dog breeders have also tended to selectively breed for features such as tameness and docility as well as for physical characteristics that appeal to their particular wishes. While some breeders may be seeking dogs that will be good hunting companions or guard dogs, generally the trend has been to favor more infantile or anthropomorphic attributes among dogs being kept primarily as pets or companion animals.

Recently, there has been an increasing interest in understanding the importance of the "human-animal bond" among researchers in a variety of disciplines. Social workers, nurses, veterinarians, anthropologists, occupational therapists, and psychologists (to name just a few) have all begun to seek answers to the question of why humans seek an affinity with their animal companions and what are the potential benefits to creating and sustaining these bonds, as well as considering the possible costs and drawbacks. There have been calls for more centralized research on the topic to draw together sources from disparate but interrelated fields, and the creation of groups such as Delta Society and the field of anthrozoology, with articles being published in the journal *Anthrozoös* (Hines, 2003). Beginning with a review of literature in the field to date, and then looking more closely at particular areas in which the benefits of dog ownership have been studied, this paper will then conclude with the description of an original study designed to test the hypothesis that pet dogs may serve as a buffer against negative mood. This hypothesis is based on the notion that the human-animal bond has many characteristics in common with attachment between humans, and that pets dogs are a source of social and emotional support. Dogs help their owners maintain a connection with the natural world, and are perceived as nonevaluative and empathic.

Review of the Literature

Viewing the human-animal bond as a form of attachment and a source of social support, such a bond may be seen as conducive to therapeutic work, with domestic animals facilitating the building of a therapeutic alliance as well as providing opportunities for individuals to develop caring and nurturing roles in relation to companion animals. Companion animals have been used in mental health settings as long ago as the York Retreat in 1792 (Netting, Wilson, & New, 1987), and there is a growing body of evidence suggesting that they may offer physical health benefits as well (Jennings, 1997). With some studies emphasizing the benefits of pet ownership, while others focus on animal-assisted interventions such as animal-assisted activities (AAA) or animal-assisted therapy (AAT), there are a variety of approaches in the literature to investigating the human-animal bond. Even focusing specifically on the potential benefits of dogs, studies range from anecdotal reports of dog visitation programs to epidemiological studies of the health benefits of dog walking, so this review will limit itself largely to research describing how people may benefit emotionally from interactions with dogs.

The stress-reducing value of the human-animal bond may be based on the nonjudgmental stance of dogs, and Judith Siegel (1993) argues that dogs may be more beneficial at times of stress, and that the amount of support they provide may be dependent on the strength of the person's attachment to the dog. Attachment theory may be applied to interspecies as well as intraspecies relationships (Melson, 2002), and Alan Beck and Aaron Katcher (2003) draw on the biophilia hypothesis and social support

theory in their work, suggesting that the human brain is "hardwired with a predisposition to pay attention to animals and the stimulus properties of the surrounding environment" (p. 80). All these authors provide support for studying the human-animal bond within a larger contextual or ecological approach, one that is often overlooked in the literature by a failure to control for the environmental factors (single-family homes, back yards, etc.) that often accompany dog ownership.

As the domestic dog is the most commonly owned pet in today's society (Wells, 2007), understanding what motivates dog owners to acquire dogs – as well as understanding why some people do not want dogs or choose to give up their dogs after acquiring them – seems an important goal for both human and animal welfare. As sources of social support, dogs may act as buffers against the stress of traumatic events and contribute to reductions in loneliness, anxiety, and depression as well as increases in self-esteem. They may also act as "social lubricants" by promoting interactions between people. Understanding the ways in which dogs may impact human psychological well-being, and identifying which humans are most likely to benefit, are among the primary goals in research on the human-companion animal bond.

"A dog is one of the remaining reasons why some people can be persuaded to go for a walk."

-O. A.

Physiological impact of dogs. Though focusing primarily on cardiovascular health measures such as blood pressure and heart rate, considering that there is a strong

connection between physical and psychological well-being, a brief summary of research on the physiological benefits of human-canine interactions is relevant. The role of touch is important in the establishment of attachment, and several authors suggest that petting and playing with dogs has overall health benefits as well. Erika Friedmann and Aaron Katcher are at the forefront of research in this field, finding a survival advantage for pet owners one year after being diagnosed with coronary heart disease (Friedmann, Katcher, Lynch & Thomas, 1980), though the effect was fairly small after controlling for initial illness severity, employment, age, mood, and place of birth (Wright & Moore, 1982). They followed up their initial study, finding a survival advantage for dog owners specifically, independently of other factors, though human social support also tended to predict survival (Friedmann & Thomas, 1985, 1995).

The first authors to compare how people respond to familiar versus unfamiliar dogs (Baun, Bergstrom, Langston & Thoma, 1984) found the largest decreases in blood pressure when participants pet their own dogs rather than unfamiliar dogs, suggesting a role of attachment in determining the physiological effect of a dog's presence. Aaron Katcher (1985) found that the presence of a dog could lower blood pressure in children completing a reading task, even if the children did not interact with the dog; Jenkins (1986) found that dog owners exhibited lower blood pressure while petting their dogs compared to reading aloud, and Wilson (1987) found the same effect for an unfamiliar dog with college students. Some authors did not find the same results (Gaydos & Farnham, 1988), observing that some participants were excited by the novelty of petting an unfamiliar dog and that their excitement may have canceled out any effect of the

presence of the dog on their blood pressure readings; also, dog owners who pet their own dogs were sometimes anxious about their dogs' behaviors, or had high-energy dogs that they were used to playing with actively outdoors. Therefore, many variables need to be considered when considering the possible effects of human-dog interactions.

Other authors have moved beyond basic measures of physiological change to investigate concomitant changes in participants' levels of anxiety (Wilson, 1991), but it is the work of Karen Allen and her colleagues that marked a shift to the specific examination of the impact of a dog's presence in stressful situations (Allen, Blascovich, Tomaka, & Kelsey, 1991). While reading a book out loud may be considered moderately stressful, Allen et al.'s female participants had to perform mental arithmetic tasks by counting out loud backwards by 13s or 17s from a 4-digit number while in the presence of a friend, a dog, or only the experimenter (the experimenter was present in all three conditions). These authors found that physiological reactivity was significantly higher in the friend present condition than in the control condition, whereas it was significantly lower in the dog present condition than in the control condition, suggesting that it is not just physical contact or social support but also a nonevaluative stance that may contribute to the buffering effect of pet dogs in a stressful situation.

Allen, Shykoff and Izzo (2001) made another unique contribution to the literature by assigning pet ownership status randomly to a group of hypertensive stockbrokers who had all expressed a willingness to acquire a pet; though all the participants took blood pressure medication, resulting in overall lower resting levels of blood pressure, the dog owners in the presence of their dogs exhibited significantly lower responses to mental

stress. The mental arithmetic stress task was used again (Allen, Blascovich, & Mendes, 2002) to demonstrate that pet owners had significantly lower heart rate and blood pressure levels during a resting baseline, reacted less to the mental arithmetic as well as to a cold pressor stimuli, and also recovered more rapidly, with the lowest reactivity and the quickest recovery in the pet-present conditions relative to a friend-present or a spouse-present condition. Among pet owners, the presence of the pet and spouse resulted in significantly more reactivity than with just the pet present, but significantly less reactivity than with just the spouse present. Also, participants tended to make fewer errors on the mental arithmetic tasks in the presence of their pets.

Some authors have also suggested an applied use for the finding that pet dogs may reduce blood pressure in stressful situations, with Nagengast, Baun, Megel, and Liebowitz (1997) finding reductions in children's blood pressure, heart rate, and behavioral distress in the presence of a dog during a physical examination. Havener, Gentes, Thaler, Megal, Baun, Driscoll, Beiraghi, and Agrawal (2001) did not find the same effects for children visiting a dentist's office, though for children who expressed verbal distress when they first arrived at the clinic, the presence of the dog decreased physiological arousal while the child was waiting for the dentist to arrive. The amount of distress may be related to the potential for benefiting from the presence of a dog. Finally, attitudes towards pets in general as well as attachment to a specific pet may be related to how participants respond to the presence of a dog (Friedmann, Locker, & Lockwood, 1993), with college students who had more positive attitudes towards animals demonstrating lower cardiovascular responses to verbalization with a dog present.

Within the past decade, a greater ability to measure neurochemical changes has contributed a new area of research to the study of human-animal interactions. J. S. J. Odendaal has done most of this work, with his first study (Odendaal, 2000) demonstrating that the neurochemicals involved in attention-seeking behaviors increase during positive interactions between humans and dogs. He also found that dog owners interacting with their own dogs had higher oxytocin levels than dog owners interacting with strange dogs; oxytocin is commonly regarded as a measure of social attachment. Odendaal and Lehmann (2000) found similar neurochemical changes in both dogs and their owners after positive interactions, indicating a high degree of interspecies social symbiosis. Some of the neurochemicals involved include beta-endorphin (associated with analgesia and euphoric states), oxytocin (associated with intimate bonding), prolactin (associated with nurturing and parenting behavior), phenylethylamine (associated with attachment), and dopamine (associated with pleasure) (Odendaal & Meintjes, 2003). Nagasawa, Kikusui, Onaka, and Mitsuaki (2009) lend further support to this research, finding that a dog's gazing at its owner is sufficient to increase the owner's levels of urinary oxytocin during social interaction. In addition, they found that owners who reported a higher degree of attachment to their dogs also received a greater duration of gaze from their dogs and had higher levels of urinary oxytocin after social interaction.

Other authors have sought out evidence of more general health benefits of dog ownership. Anderson, Reid, and Jennings (1992) found that pet owners had significantly lower blood pressure and cholesterol levels than non-owners, but Robb and Stegman (1983) did not find any differences between pet and non-pet groups on health-related

variables. Friedmann and Thomas (1985) suggest an indirect benefit of pets on health; if loneliness causes increased morbidity and mortality, pets may decrease loneliness.

Judith Siegel (1990) used a prospective design of 1,036 Medicare recipients in California, finding that respondents with pets had fewer total doctor contacts over a one-year period than those without pets, even when controlling for other demographic variables; additionally, while stressful life events tended to precipitate more doctor visits among respondents without a pet, stressful life events were unrelated to doctor visits among respondents with a dog. Stallones, Marx, Garrity, and Johnson (1990) did *not* find a significant association between pet ownership, attachment to pets, and illness among a group of 1,300 respondents; however, younger adult (21-34 years of age) and older adult (45-65 years of age) pet owners who had stronger human social support networks tended to be *less* attached to their pets, and among 35-44 year olds, pet attachment was positively associated with *higher* depression scores; age clearly needs to be taken into account when evaluating the potential impact of pet ownership.

Dog owners reported a highly significant reduction in minor health problems and had elevated scores on a health questionnaire 10 months after the initial acquisition of a pet (Serpell, 1991). Garrity and Stallones (1998) believe that the health impact of pets is due to their role as sources of social support, where "pets are viewed as a type of nonhuman social support capable of conferring health and behavioral benefits on their human partners" (p. 5). Budge, Spicer, Jones, and St. George (1998) suggest that it is when owners are more compatible with their pets that they are the most likely to experience physical and psychological benefits from pet ownership; they also

hypothesize that the mixed findings relating pet attachment to health may be due to some owners with more health problems becoming more attached to their pets because they are more limited in their social interactions outside the home.

In the past decade, Australian epidemiological research has focused a great deal on the association of pets with well-being, with Bruce Headey (1999) supporting Siegel's earlier (1990) findings that pet owners make fewer annual doctors' visits. He also found that both dog and cat owners were less likely to be on medications for heart problems and sleeping difficulties than non-owners. The three gender-age groups who tended to utilize physician services the most (young women, older women and older men) also showed the greatest health benefit from owning pets. Dog owners in particular reported feeling less lonely than non-owners, and a majority of pet owners felt they had met other people through their pets, and that having a pet facilitated conversations. In contrast, Parslow and Jorm (2003) found that among Australians aged 40-44 measures of physical and mental health were not significantly associated with pet ownership, and pet owners tended to use pain relief medication more frequently than non-owners; they suggest that the age group involved is less likely to benefit from pets, as they were also more likely to have dependent children and to be in the workforce; there are circumstances in which caring for a pet may become more of a chore than a pleasure.

Overall, pet owners who continuously own pets are in the best health, whereas people who either stop owning pets or never owned pets are less healthy (Headey & Grabka, 2007). Headey, Na and Zheng (2008) had the unique opportunity to conduct a "natural experiment" on pet ownership, since pets had been banned from urban areas in

China until 1992. Among 3,031 women, half of whom owned dogs, the dog owners reported better health, more exercise, better sleep, fewer sick days off from work, and fewer visits to doctors.

Most recently, there has been a surge in research specifically investigating the relationship between dog ownership and dog walking. Bauman, Russell, Furber, and Dobson (2001) found that while dog owners walked on average 18 minutes per week more than non-owners, more than half of dog owners did not walk their dogs at all. In addition, dog owners in their study were actually less likely than non-owners to meet recommended levels of physical activity, suggesting that exercise is not likely to be the means by which dogs convey health benefits to their owners. Brown and Rhodes (2006) did find that dog owners spent more time in mild and moderate physical activities and walked an average of 300 minutes per week compared to non-owners who walked an average of 168 minutes per week, but there was not a difference between dog owners and non-owners for more strenuous physical activity; also, once dog walking was removed, dog walkers walked less and were less physically active than non-owners. They found that dog owners who felt more of an obligation to care for their dog were more likely to walk their dogs more often.

The primary source of information on dog walking is the Australian RESIDE study, a 5-year longitudinal study evaluating the impact of a state government subdivision code in Perth, Western Australia. Hayley Cutt, Billie Giles-Corti, Matthew Kniuman, and Valerie Burke (2006) use an ecological model to explore factors that may obstruct or facilitate owner's decisions to walk their dogs in public. They observe

seasonal variations in dog walking patterns, as well as an association between owners' levels of attachment to their dogs and the size of the dogs with frequency of dog walking behaviors. They propose that it is not only the exercise but also the contact with other people in the community and the time spent in a natural environment that contribute to the health-enhancing properties of walking dogs. Cutt, Giles-Corti, and Knuimann (2007) found that while 23% of dog owners did not walk their dogs, among dog walkers, more dog walkers achieved 150 minutes of physical activity per week than dog owners who did not walk their dogs. Cutt, Giles-Corti, Knuiman, Timperio, and Bull (2008) also found that dog owners saw their neighborhoods as more attractive than did non-owners, reported higher neighborhood cohesion than non-owners, and had higher confidence in their ability to adhere to a daily walking schedule irrespective of barriers such as work, family, or social commitments. While dog ownership does not automatically result in an increase in physical activity, dog owners who do walk their dogs are more likely to achieve more minutes of moderate to vigorous physical activity than non-owners or dog owners who do not walk their dogs (Coleman, Rosenberg, Conway, Sallis, Saelens, Frank, & Cain, 2008).

"No animal I know of can consistently be more of a friend and companion than a dog."
-Stanley Leinwoll

Benefits of dogs for marginalized populations. Aside from the obviously utilitarian benefits of service dogs, ranging from guide dogs helping their blind owners navigate to assistance dogs performing tasks for wheelchair-bound owners, many authors

have suggested that service dogs provide social support for their owners as well. These dogs help to facilitate interactions in the community, as many individuals without disabilities have a tendency to exhibit social discomfort in the presence of individuals with disabilities, demonstrating gaze avoidance, greater personal distance, and briefer social interactions (Eddy, Hart, & Boltz, 1988). Eddy et al. found that passersby tended to smile more often and engage in more conversations with participants in wheelchairs when a service dog was present. On the down side, some participants felt that their service dogs received more acknowledgments than they did. Children with disabilities have also been found to benefit socially from the presence of a service dog (Mader and Hart, 1989), and individuals with hearing ear dogs reported feeling less lonely, safer, and more independent, as well as experiencing more friendliness from strangers (Valentine, Kiddoo, and LaFleur, 1993).

Owners of assistance dogs reported an increased sense of social integration and a supportive relationship with their dog (Lane, McNicholas, & Collis, 1998), blind guide dog owners felt the support provided by their dogs surpassed their expectations (Steffens & Bergler, 1998). There were stronger emotional ties between blind people and their dogs than in an average population of dog owners. Guide dogs brought them into more contact with other people, reduced tension and strain, and promoted more relaxed walking.

Another instance of dogs contributing to well-being in marginalized populations is among prisoners, with Aaron Katcher, Alan Beck, and Deniel Levine (1989) describing the People, Animals and Love (PAL) program at the District of Columbia Department of

Corrections Lorton facility. Though they found a small decrease in the number of offenses by the pet group compared to a control group during the first year after pet acquisition, it was not statistically significant. Other authors found decreased depression among women prisoners training dogs to become companions for the elderly and individuals with disabilities (Walsh & Mertin, 1996) but their follow-up was done when the women were about to be released from prison, creating a possible confound in the interpretation of positive effects. Earl Strimple (2003) found one prison associating participation in a dog training program with reduced rates of recidivism, though Gennifer Furst (2006) notes that inmates are generally selected for these programs based on good behavior. Fournier, Geller, and Fortney (2007) did find an increase in social sensitivity scores among prisoners participating in a human-animal interaction program with dogs, as well as increased treatment progress in the therapeutic community and decreased institutional infractions. While some might argue that prisons are intended to punish rather than rehabilitate, it is possible that inmate-animal interaction programs may have a larger benefit on society as a whole if they contribute to decreased recidivism; in addition, prisoners are often training animals for adoption or to prepare them for future roles as guide dogs or therapy dogs.

Among the most socially isolated and marginalized members of our society are the homeless. While homelessness clearly comes with a decreased ability to financially care for a pet, there are nonetheless a large number of homeless people with pets. Aline and Robert Kidd (1994) found that homeless pet owners were extremely attached to their pets and had owned significantly more pets in childhood and adolescence than non-

owners. They also observed that the presence of a pet made other people friendlier. Taylor, Williams, and Gray (2004) found that homeless dog owners were less likely to be taking drugs than non-owners, though they were also more likely to have health problems since they often gave food to their pets before themselves, and avoided visits to the doctor partly because they were worried they might be separated from their pets.

Finally, though some health professionals raise concerns regarding the safety of housing pets with immunocompromised individuals, in other cases the emotional benefits of pet ownership among patients with HIV and AIDS may outweigh the risks, so long as proper hygiene and reasonable precautions are maintained. Betty Carmack (1991) found that gay men with HIV or AIDS perceived their pets as providing affection, support, nurturance, and acceptance. They also said that the presence of their pets made it easier to talk to other people. Siegel, Angulo, Detels, Wesch, and Mullen (1999) found that participants in the Multicenter AIDS Cohort Study with AIDS who owned pets reported less depression than participants with AIDS who did not own pets; this pattern was strongest among those who additionally reported having few confidants.

"There is no psychiatrist in the world like a puppy licking your face."
-Ben Williams

Animal-assisted therapy. The bulk of the literature on the benefits of pets is in the field of animal-assisted therapy (AAT). Early writers in this field were already proposing that humans have an innate need to affiliate with animals, prior to the introduction of the biophilia hypothesis (Brickel, 1986), and as of 1995, there were approximately 2,000

distinct AAT programs in the United States alone (Voelker, 1995). The most commonly used animal is the dog, though not all dogs are equally suited to becoming therapy animals. In the 1990s, The Delta Society, an international and interdisciplinary group with research, educational, and public service activities in the area of interaction between people and animals developed the first comprehensive standards of practice, differentiating between programs that "incorporate animals for the purposes of entertainment or generalized population benefits" as animal-assisted activities (AAA), and "those that seek to cause a prescribed effect on specific patients" as animal-assisted therapy (AAT) (Hines & Fredrickson, 1998).

One meta-analysis of empirical research to date on AAT (Nimer & Lundahl, 2007) found that 49 out of 250 studies reported on AAT rather than AAA or pet ownership, included five or more participants in a treatment group, and included data sufficient for the calculation of an effect size. The authors identified moderate effect sizes in improving outcomes in four areas: autism spectrum disorders, medical difficulties, behavioral problems, and emotional well-being; the use of dogs was most consistently associated with moderately high effect sizes. Individuals with disabilities tended to benefit more on medical outcomes, whereas non-disabled individuals tended to benefit more on well-being and behavioral outcomes. Young children consistently benefited across all outcome variables, while other age groups were less consistent in the degree to which they benefited from AAT. The authors also noted that it might be possible to "overdo" AAT, as there were negative associations between the number of sessions and

medical outcomes. They speculate that the use of animals in therapy may be beneficial because “animals seem to have a natural tendency to create a bond with people” (p. 226).

"The dog was created specially for children. He is the god of frolic."
-Henry Ward

Animal-assisted interventions with children. Boris Levinson, widely recognized as the founder of animal-assisted psychotherapy, stumbled upon the therapeutic benefits of his pet dachshund, Jingles, when the unplanned presence of his dog in the office facilitated a positive reaction from a previously withdrawn child. Levinson (1961) promotes the belief that the importance of pets “is psychological rather than practical. In many ways, the relationship between man and dog, especially between child and dog, can be more salutary than one between two human beings” (p. 59). He surmises that the provision of acceptance, companionship, and emotional expression are more crucial to therapy than any prescribed theory or technique, and that pets can be a source of these benefits. Since children are rarely the ones to initiate therapy, a dog can be a potential icebreaker for children who do not feel comfortable interacting with a therapist. Levinson also expresses optimism that pets can be used to encourage children to become more socially oriented and empathic.

Though it took more than twenty years for research on AAT with children to begin in earnest, Yvonne Gonski (1985) describes the use of dogs as therapy in a child welfare setting, observing that the presence of her dogs elicited conversations from the children. While children in the foster care system often have difficulties in forming

attachments and are frequently distrustful of adults due to histories of inconsistent parenting and abuse or neglect, dogs may serve as non-threatening sources of comfort and affection that can act as a bridge between child and caseworker. According to Gonski, dog therapy exploits "the natural affinity that most children have for animals and the spontaneous and ingenuous bond that exists between them . . . A child's involvement with an animal can teach him/her responsibility, trust, empathy, and affection" (p. 101).

Emotionally disturbed children have demonstrated improved social relations with other children after AAT (Kogan, Granger, Fitchett, Helmer, & Young, 1999), and AAT has also been used in residential treatment facilities (Mallon, 1994) and with abused children (Reichert, 1994, 1998; Parish-Plass, 2008), with therapists observing that the presence of a dog may help the child to disclose abuse and to express feelings. Because a dog is seen as nonjudgmental, children may feel more confident when sharing feelings that they may be ashamed of in the presence of a dog. Parish-Plass additionally surmises that a therapy pet may serve as an attachment figure, enabling the abused child to develop more adaptive social strategies and more empathic abilities. Patients may also see the clinicians that accompany pets as friendlier and less threatening (Bardill & Hutchinson, 1997).

In hospital settings, medically ill children displayed more positive affect (Kaminski, Pellino, & Wish, 2002; Wu, Neidra, Pendergast, & McCrindle, 2002) in the presence of a therapy dog. Dog visitation programs have also been used in hospitals to decrease children's perception of pain (Sobo, Eng, & Kassity-Krich, 2006). AAT has also been used with autistic children to increase socially appropriate behaviors and to

increase the overall frequency of social interactions with an adult (Redefer & Goodman, 1989; Martin & Farnum, 2002). Therapy dogs have also been shown to increase performance on psychomotor tasks among preschoolers (Gee, Harris, & Johnson, 2007) and to increase social responsiveness among children with developmental disabilities (Esteves & Stokes, 2008).

AAT has been incorporated into school-based social training programs (Tissen, Hergovich, & Spiel, 2007), with teachers observing a significant improvement in social behavior in classrooms with a therapy dog even when social training was not part of the curriculum; the effect was similar in magnitude to social training without the dog present and social training with the dog present. Social training with the dogs present had a significantly stronger impact in a positive direction on the students' levels of open and relational aggression compared to social training without the dogs present or the presence of dogs without the social training curriculum.

Animal-assisted interventions with older adults. Samuel and Elizabeth Corson (1978, 1981) were among the first researchers to propose therapeutic benefits of pets among the elderly. They suggest that the loss of economic and social roles that accompany retirement and children leaving the home may contribute to decreases in self-esteem, independent functioning, socialization, and goal-directed activity. When an older adult is additionally confined to a nursing home, the effect is only compounded, as the psychosocial environment of a nursing home may be detrimental to the physical and psychological well-being of already impaired clients. The positive nonverbal communication that occurs between dogs and nursing home residents is intended to

counteract or alleviate frequently negative nonverbal communication that may occur between nursing home residents and staff. The Corsons speculate that people develop an attachment to pet dogs in particular due to their nonjudgmental nature and maintenance of "a sort of infantile dependence" throughout their lives. They observe that even among nursing home residents who initially relate almost exclusively to therapy pets, the pets eventually begin to serve as social catalysts, encouraging interpersonal interactions.

Clark Brickel (1980-81) also notes that AAT increases opportunities for social interaction among the elderly. Robb, Boyd, & Pristash (1980) found that social behaviors among nursing home residents were highest in the presence of a caged puppy, compared to a flowering plant or a wine bottle. Francis, Turner, & Johnson (1985), while investigating animal visitation (AAA) rather than AAT, found that residents of an adult home receiving visits from six puppies and their handlers when compared to residents of an adult home receiving only visits from people without dogs demonstrated improvements in social interaction, psychosocial function, life satisfaction, mental function, social competence, and psychological well-being at a statistically significant level. Other authors have not found a significant difference between pet visits and human visits (Hendy, 1987), or have found that initial benefits demonstrate rapid attrition after the dog visitation period is over (Winkler, Fairnie, Gericevich, & Long, 1989). Winkler et al. additionally found a greater benefit for the nursing home staff than for the nursing home patients.

Evidence of the social facilitation effect of pet visitation or pet therapy programs continues to be reported fairly consistently, with Fick (1993) observing that the presence

of a dog during a group therapy session was associated with nearly twice the number of verbal and nonverbal interactions among nursing home residents during a socialization group. Kaiser, Spence, McGavin, Struble, & Keilman (2002) found that a dog elicited more pro-social behaviors from nursing home residents than did a "happy person," but that this was primarily due to patting the dog; when patting the dog was removed, pro-social behaviors in response to the dog were similar in number to those in response to the happy person. Marian and William Banks (2002) found that AAT was associated with decreased reports of loneliness among nursing home residents, and Prosser, Townsend, and Staiger (2008) observed increases in social interactions between nursing home residents who participated in AAT.

Alzheimer's and other dementias. Kongable, Buckwalter, and Stolley (1989) found that the presence of a pet dog increased the total number of social behaviors of Alzheimer's clients in a veteran's home. They observe that for Alzheimer's patients, interacting with pets provides companionship and social stimulation without the requirement of high intellectual, cognitive or social skills. The nonjudgmental nature of pets means that they provide affection and companionship regardless of the patient's cognitive or physical abilities, and this unconditional acceptance may have a restorative effect on the Alzheimer's patient's self-esteem. Walsh, Mertin, Verlander, and Pollard (1995) suggest that such effects may be palliative rather than therapeutic, modifying extreme behaviors and generating pro-social responses in the presence of the dog, but not producing lasting measurable changes in adaptive functioning.

The overall frequency of smiles, touching, gaze, warmth and praise as well as duration scores for smiles, touching, gaze and physical proximity were significantly higher in the presence of a pet dog and human visitor compared to a human visitor alone (Batson, McCabe, Baun, & Wilson). Churchill, Safaoui, McCabe, and Baun (1999) reported similar findings, and Richeson (2003) also found a significant increase in social interactions among patients with dementia while they were participating in AAT, though the effects did not persist for long beyond the intervention period. Sellers (2005) found a significant increase in social behavior of dementia patients receiving AAT from baseline to treatment, though her study lacked a comparison group for control.

Other authors have found emotional benefits for Alzheimer's and other dementia patients receiving AAT, with Kawamura, Niiyama, & Niiyama (2007) finding improvements in stability and appropriateness of emotional expression over a 12-month period. The same authors (Kawamura, Niiyama, & Niiyama, 2009) additionally found that Alzheimer's and dementia patients who were likely to benefit from AAA or AAT were more likely to have owned a dog in the past; the therapy dogs triggered memories of their own dogs. They felt that the dogs provided a break from their daily routines, and gave them the opportunity to interact with other residents and staff. They also enjoyed communicating with the volunteers who accompanied the dogs.

AAT and mental illness. Arlene Siegel's (1962) writing on the use of AAT with mentally ill patients predates most of the work of Boris Levinson, and it was actually veterinarians who were among the first to notice "the therapeutic effect of pets on people with physical or mental illnesses who are depressed or even suicidal" (p. 1046). Among

the mentally ill, "communication may be established more easily with a pet than with a parent or relative" (p. 1046). She speculates that severely withdrawn patients, particularly schizophrenics, may be reachable through pets.

The Corsons were among the first to empirically validate such observations (Corson, Corson, Gwynne, & Arnold; 1975, 1977), finding that psychiatrically hospitalized patients that did not demonstrate any interest in watching television would intensely watch videotapes of their own social interactions with therapy dogs. They also observed that in addition to individual benefits, the AAT program contributed to an overall positive increase in social interactions on the ward as a whole. While in the initial stages some of the patients interacted with the dogs to the exclusion of human interactions, the dogs ended up serving as a catalyzing social link on the patient ward.

AAT has been successfully used in the rehabilitation of psychiatric inpatients, with group therapy conducted in the presence of caged finches associated with significantly greater improvements than therapy conducted in the absence of the finches (Beck, Seraydarian, & Hunter, 1986). Though using birds instead of dogs, what is noteworthy about this study is that it ended after just ten weeks because half the patients in the treatment group were successfully discharged, while all the patients in the control group were still hospitalized. Barker and Dawson (1998) also found statistically significant reductions in anxiety scores after AAT for patients with psychotic disorders; the reduction was twice as great after AAT as after therapeutic recreation. Barak, Savorai, Mavashev, and Beni (2001) found that a one-year controlled trial of AAT was associated

with significant improvement in social adaptive functioning among elderly schizophrenic patients.

Other authors found a schizophrenic AAT group demonstrating significant improvements in anhedonia, improved use of leisure time, and improved motivation in relation to a control group (Nathans-Barel, Feldman, Berger, Modai & Silver, 2005). Nathans-Barel et al. especially noted that the patients reported feeling attached to the therapy dog, said they missed the dog between sessions, and looked forward to the AAT sessions with anticipation. During sessions, patients called the dog by name and used terms of endearment as well as nicknames; they also expressed concern for the dog's health and general well-being. After the study ended, patients expressed feelings of sadness and longing for the dog and also asked how it was doing.

AAT has also been suggested for use with patients diagnosed with posttraumatic stress disorder (PTSD) (Altschuler, 1999; Lefkowitz, Pharia, Prout, Debiak, & Bleiberg, 2005), though only one case study describes the actual implementation of such a program (Sockalingam, Li, Krishnadev, Hanson, Balaban, Pacione, & Bhalerao, 2008). The patient displayed improvements in mood, outlook on life, and increased spontaneous speech, as well as demonstrating decreased anxiety and agitation and exhibiting improved quality of sleep and concentration abilities. The patient also reported improvements in physical health and reduced social isolation as the result of walking the dog. AAT has also been incorporated into Reality Therapy (Minatrea & Wesley, 2008) with inpatients having a history of substance abuse, with patients in the AAT group reporting a more positive opinion of the therapeutic alliance.

Other health conditions. While not used to treat health conditions *per se*, AAT has been used to alleviate the stressful impact of illness. Irene Muschel (1984) believes that the effectiveness of AAT with terminal cancer patients stems from the "empathic presence of a caring creature who can be emotionally and physically close" (p. 453). Though the physical deterioration in many patients precluded an increase in socialization in relation to AAT, patients did report decreases in loneliness, fear, despair, and isolation. Not surprisingly, patients who were able to emotionally engage with the pets were more likely to report benefits of AAT.

Florence Nightingale, who observed that pets provide companionship to the sick, first promoted AAT among the medically ill, particularly chronically ill patients (Jorgenson, 1997). Animals were used at the Army Air Corps Convalescent Hospital in Pawling, New York from 1944-45, where patients worked on the hospital farm. Johnson, Meadows, Haubner, and Sevedge (2003, 2008) found that among cancer patients waiting for radiation treatments, both dog visits and human visits were scored more positively than reading magazines. Participants in the dog group gave more positive responses than did those in the human group about whether their session made radiation therapy easier and made them feel better. They also rated the dog as a confidante and a friend to whom they felt attached more often than did those in the human visitor group. More participants in the dog group reported that the dog comforted them, made them feel happy, and gave them energy than did participants in the human visitor group; they were also more likely to tell others about the dog, to look forward to seeing the dog, and to want to have the dog visit their home. Also, participants in the human visitor and reading

groups believed that their emotional health had declined during the study, whereas participants in the dog group believed it improved.

Finally, two studies have found a positive impact of AAT for patients with aphasia (Macauley, 2006; LaFrance, Garcia, & Labreche, 2007). Aphasic clients felt more motivated, less stressed, and enjoyed the therapy sessions more during AAT compared with traditional therapy. The patients also demonstrated more emotion during AAT sessions, initiating communication about their own pets or loss of pets. The patients tended to speak with more effort when responding to the clinician than when asked to direct their responses toward the dog, and initiated more speech during AAT sessions than traditional sessions; most of these initiations were directed towards the dog.

Impact of AAA/AAT on caregivers. If the presence of a therapy dog facilitates social interactions, it is likely to do so for the staff and therapists who work with patients as well. The emotional support provided by a dog may also buffer against "burn out" among therapists who use AAT, though this has not been studied systematically. In addition, the presence of a therapy dog may change the behaviors of the therapists as well as the patients; Kahn and Jacobs (2003) found that physical therapists using AAT provided directions that resulted in fewer revisions in contrast to standard treatment; in addition, the physical therapist using AAT was less likely to interrupt the patient. Volunteers or handlers who bring dogs for visitation programs find that the presence of their dogs eases interactions with nursing home residents or hospital patients, situations they might normally find socially awkward or stressful (Savishinsky, 1992). Despite

their relationship with their dogs, however, some volunteers still drop out due to the unexpected emotional strain of coping with depressed or ill patients.

"Acquiring a dog may be the only time a person gets to choose a relative."

-Unknown

Pets across the life course: the family pet

In a special issue of *Marriage and Family Review* on "Pets and the Family," several authors offer a variety of perspectives on the role of pets in family life. Cain (1985) describes how many pet owners see their pets as family members, with pets sometimes being brought into conflicts between family members. In addition, the vast majority of pet owners report experiencing an important to extreme loss when they lose a pet. Soares (1985) believes the role of a pet varies depending on how functional or dysfunctional the family unit is, with problematic attachment patterns leading to compulsive care giving and pathological mourning on the death of a pet. Pets may serve as protective factors for abused children, but the pets of abused children are unfortunately likely to be targets of abuse themselves. Attachment to pets tends to be highest among never-married, divorced, widowed and remarried people, childless couples, newlyweds, and empty-nesters (Albert & Bulcroft, 1988).

The beneficial role of pets in families also includes social catalysis, as couples who have pets but no children – whether by choice or due to infertility – may use their pets to establish involvement with other pet owners (Blenner, 1991). Family pet attachment is also strongly related to family adaptability and family cohesion (Cox, 1993);

family cohesion is the emotional connectedness experienced between family members. A majority of people with pets refer to themselves as their pets' parent (Cohen, 2002), and nearly three quarters of married respondents greet their pets before their spouses.

Pets and children. Some authors have found an association between childhood experience with pets and liking for pets in adulthood (Serpell, 1981), while others believe that pets play a large role in children's emotional development (VanLeeuwen, 1981). VanLeeuwen promotes the notion that children who never have the opportunity to become involved with an animal are "deprived of an opportunity that usually gives depth to a wide range of emotional experience" (p. 175). While this does not necessarily have to be accomplished through pet ownership, learning to care for animals and feel warmth towards them are important aspects of the human-animal bond in childhood development. In a survey of 10-year-old children (MacDonald, 1981), most of the children surveyed saw their dog as a companion, and additionally reported social contact with other children while playing with or walking their dog. A majority of the children talked to their dog and believed that their dog could understand their speech, respond to their moods, and understand their feelings.

Children's attachment to pets may start quite early, as even infants between the ages of 6 and 12 months will respond to a family dog or cat entering the room by smiling, and may even try to follow the pet (Kidd & Kidd, 1985). Clark Brickel (1985) suggests that children are "taught" to love animals by their families within a framework of social learning theory, while Robin and ten Besel (1985) describe the role of pets in the socialization of children. Pets may satisfy a child's need for physical contact and touch,

as well as empathic listening and association with others. Pets may also elicit nurturing behaviors in children as young as 3 years old.

The age at which children have their first experience with pets may be related to their self-concepts as adults (Poresky, Hendrix, Mosier, & Samuelson, 1987, 1988), with college students' total positive self-concept scores being higher if they were under 6 or over 10 years old when they had their first pet. Though relying on retrospective reporting, which tends to be problematic, the authors also found that the strength of the adolescent pet-owner bond was associated with the highest self-concept scores. Ratings of students' relationships to their current pets were also higher for respondents who had stronger child-companion animal bonding scores. Poresky (1990; Poresky & Hendrix, 1990) also found a significant correlation between empathy scores for children and empathy scores for pets; although children who had pets did not have significantly higher empathy scores than those that did not have pets, children who had a strong bond with a pet had higher empathy scores than children without a pet.

Self-care children, or "latchkey kids," may be especially likely to benefit from having pets (Heath & McKenry, 1989; Guerney, 1991), as playing with pets was second only to watching television for pet owners as a way of coping with boredom or loneliness. Other authors have found a positive relationship between childhood pet ownership and humane attitudes in adulthood (Paul & Serpell, 1993), with higher levels of childhood pet keeping related to more positive attitude towards pet animals and greater concerns about the welfare of non-pet animals as well as humans. Vegetarianism and involvement with animal welfare and environmental organizations were also associated with having pets in

childhood. Ascione and Weber (1996; Ascione, 1992) also found that children's involvement with pets was positively related to their humane attitude toward animals, and that the enhancement of humane attitudes was generalized to human-directed empathy.

Preadolescent pet owners have been shown to have higher levels of autonomy, more positive self-concept, and higher self-esteem relative to their non-pet-owning counterparts (van Houte & Jarvis, 1995). A longitudinal study designed to investigate the impact of obtaining a new dog found that dog-owning children received more visits from their friends than their non-dog-owning counterparts, and that dog-owning families engaged in more leisure activities at home together; however, these effects only lasted for one month (Paul & Serpell, 1996). Robert Poresky (1996, 1997) found statistically significant links between the strength of children's companion animal bond and their empathy for other children, as well as finding that boys with dogs and girls with cats tended to have relatively higher self-concept scores as adults compared to girls with dogs and boys with cats.

Drawing on attachment theory, Sandra Trieibenbacher (1998) surmises that human-pet attachments bear a good deal of similarity to human-human attachments, with "[t]he enduring emotional bond and the reciprocal nature of the attachment relationship . . . central components defining attachment theory" (p. 136). Adolescent girls in particular were likely to have higher self-esteem in relation to the strength of attachment to their pets. Adolescent pet owners also report a higher level of well-being and more family resources than non-owners (Bodmer, 1998), though among adolescents with few family resources, pet ownership did not serve as a buffer with relation to well-

being (i.e. if they had fewer family resources, well-being was lower regardless of the presence or absence of a pet).

Pets may serve as a buffer against traumatic experiences, as Arambasic, Kerestes, Kuterovac-Jagodic, and Vizek-Vidovic (2000) found that among Croatian children, girls with pets other than a dog or cat had the highest levels of posttraumatic stress reactions (PTSR), while boys without pets and girls with a dog or cat had the least PTSR. Children with a dog or cat were more likely to exhibit coping skills such as expressing emotions, seeking support, and problem solving relative to children without pets. Gail Melson (2003) posits that animals are powerful motivators for children because children are emotionally invested in them, and this emotional investment involves factors such as social support and nurturing.

"The greatest pleasure of a dog is that you may make a fool of yourself with him and not only will he not scold you, but he will make a fool of himself too."
-Samuel Butler

Pet ownership and the older adult. Though primarily interested in the use of pets in psychotherapy with children, Boris Levinson (1969) was also one of the first to suggest the potential benefits of pet ownership for older adults. As people age, and begin to lose relatives, friends, and work associates, they may become more socially isolated; Levinson suggests that the non-human environment begins to play an increasingly significant role in their lives. Pets may become sources of security and social support again, and pets do not respond to signs of age and infirmity in the same way that other

people do. Levinson notes that widows and widowers may respond differently to a pet, with widows having a greater tendency to maintain the pet as a link to their deceased husbands, while widowers are more likely to want the pet removed.

Among older adults, pet owners tend to see themselves more favorably (Kidd & Feldman, 1981), and particularly see themselves as more nurturing than non-owners. Non-owners were more likely to perceive themselves as less self-accepting, more self-centered, more pessimistic, and more dependent relative to pet owners. Among older women, a larger percentage of women who were *not* attached to their pets were unhappy, relative to women who were very attached to their pets or who did not have pets (Ory & Goldberg, 1983). Also, pet ownership tended to be associated with greater happiness among women with higher socioeconomic status, but with less happiness among women with lower socioeconomic status. Other authors have found that pet ownership does not make a difference for owners living with others but does make a difference for those living alone (Goldmeier, 1986); while loneliness was alleviated by pet ownership in women living alone, women living with other people were significantly less lonely regardless of whether or not they owned a pet.

Among the bereaved, pet ownership and strong attachment were significantly associated with less depression only when the number of available human confidants was minimal (Stallones, Marx, Garrity, & Johnson, 1988). For older adults with less human social support, greater attachment to a pet is associated with less reported illness, whereas for older adults with higher levels of human social support, attachment to a pet is associated with slightly greater reported illness. Lago, Delaney, Miller, and Grill (1989)

conducted a longitudinal study of pet owners, finding lower mortality rates among current pet owners and higher mortality rates among former owners who no longer owned pets. Miller, Staats, and Partlo (1992) similarly found pet owners to have greater perceived physical health than non-owners, as well as greater overall satisfaction with life and a significant *increase* in time spent doing things with friends; rather than substituting for human interactions, pet interactions were positively associated with more human interactions.

In another longitudinal study of the influence of companion animals on the physical and psychological health of older people (Raina, Waltner-Toews, Bonnett, Woodward, & Abernathy, 1999), while no statistically significant direct association was observed between pet ownership and a change in psychological well-being, pet ownership did significantly modify the relationship between social support and change in psychological well-being over a 1-year period. Specifically, the relationship between psychological well-being and the availability of support in a crisis situation was modified by the presence or absence of a pet. "That is, the respondents who owned pets and had lower social support in a crisis situation were, on average, less likely to decline in psychological well-being compared with respondents who did not own pets and had lower social support" (p. 327).

"If I have any beliefs about immortality, it is that certain dogs I have known will go to heaven, and very, very few persons."

-James Thurber

Pets and bereavement. Boris Levinson (1967) introduces the connection between pets and bereavement from two perspectives, one being a child's bereavement upon the loss of a cherished pet, the other the use of a pet in helping a child cope with the loss of a parent or other family member. Cowles (1985) describes responses of pet owners to the deaths of their pets, noting that there is little recognition that the intensity of grief experienced at the loss of a pet may be as strong as that associated with the loss of a human family member. Pet owners have the additional challenge of not feeling understood by friends and colleagues who seem to be insensitive to the degree of bereavement they experience (Carmack, 1985); sometimes it is even family members who appear insensitive to the depth of the owner's grief, leaving the pet owner unable to share his or her own feelings within the family.

Higher emotional attachment to the pet, sudden death, and living alone all predict higher reported grief, with attachment to the pet showing the highest correlation with grief (Archer & Winchester, 1994). Morley and Fook (2005) also discuss the importance of types of pet loss that do not necessarily involve the death of the animal, such as losing a pet in a divorce, or having to give up a pet due to financial circumstances or new living arrangements, as well as no longer being able to care for a pet due to changes in health. They suggest that, "Relationships with companion animals need to be understood and valued as a significant part of normal mainstream human experience, and that similarly

loss of these friends is an experience likely to be encountered by a major proportion of the population" (p. 140). Hunt, Al-Awadi, and Johnson (2008) investigated the impact of Hurricane Katrina, as many animals were lost or abandoned as a result of this natural disaster; forced abandonment of a pet was found to add considerably to acute trauma, increasing the risk of long-term posttraumatic stress disorder (PTSD). Both the acute loss of the pet and the continued absence of the pet contributed to depressive symptom severity.

Finally, turning to a consideration of how pets impact the experience of bereavement in response to human loss (Akiyama, Holtzman, & Britz, 1986-87), widows without pets reported higher frequencies of symptoms of physical illness compared to pet owners. Non-owners also reported significantly increased use of medication, particularly psychotropic drugs. Clearly, pet owners in a variety of circumstances derive great emotional benefits from their pets, especially when they are under stress or do not have adequate human social support networks.

"When most of us talk to our dogs, we tend to forget they're not people."
-Julia Glass

Why do people love their pets? Consistent themes in the literature reviewed so far suggest that the primary potential benefits of pets – as well as the subjective reasons for acquiring a pet provided by pet owners – tend to be related to the factors of attachment and social support. While greater attachment to a pet has often been associated with greater benefits, and pet owners with lower overall social support

networks are often among those most likely to benefit from contact with a pet, there is less understanding of how these variables play a role in the general population of pet owners. There is an unfortunate tendency for people to see inter-species relationships as somehow "less" than human-to-human relationships (Ryder, 1973), and reluctance among many pet owners to admit to strong attachment to their pets.

Ryder posits that pet animals provide love and freedom to a greater degree than many fellow human beings do, and that attachment to pets is established through tactile contact. Pets are also sensitive to human emotional states, and can engage in nonverbal emotional communication, a major component of empathy. Pets can also be loved without much risk to the owner of ever being rejected. Rynearson (1978) adds that the bond between humans and their pets depends on "their commonality as animals and their mutual need for attachment" (p. 550), though Fox (1981) notes that not all pet owners necessarily develop the same degree of attachment to their pets, with some acquiring pets to be their children's playthings or accessories. Other people obtain animals for purely utilitarian purposes, though in many instances these still develop into emotionally attached relationships. While neurotic overattachment is a possibility in some cases, overall emotional attachment and seeing the pet as a companion is a positive experience that may assist in the development of empathy and compassion.

Katcher (1981) observes that the development of attachment theory is largely responsible for a renewed interest in examining the nature of affection. Katcher suggests that pets may not be mere substitutes for human contact, but may offer a type of relationship that other human beings do not provide. One major reason for this is the

non-evaluative nature of a pet. Also, pets are perceived as empathic, and provide a socially acceptable form of affectionate touch; the tactile relationship between humans and pets is a major source of the human-animal bond. Pets are perceived as their owners' children (Berryman, Howells, & Lloyd-Evans, 1985), and become highly charged with emotional meaning, serving as "supernormal stimuli for attachment" (Case, 1987, p. 251) by their provision of affection and unconditional acceptance.

Dog owners come to see their dogs as "unique individuals who are minded, empathetic, reciprocating, and well aware of basic rules that govern the relationship" (Sanders, 1993, p. 207). Dogs are seen as having an emotional life and as being responsive to human emotional experiences. Their owners tend to see them as reciprocating in social interactions with the additional advantage that they do not make the same demands as fellow humans do. Mutual play is a primary mode of interaction between people and their pets (Sanders, 2003), and human-animal play has the advantage of not having winners or losers since maintaining the play interaction is itself the primary goal. Play requires the presence of intersubjectivity and the ability to make decisions in concert, with gaze and mutual direction of attention assuming central roles in the establishment of interspecies intersubjectivity. Pet owners often express speaking "for" their animals, and attribute the quality of mindedness to their pets. Though most pet owners acknowledge that dogs and humans have different cognitive abilities, they tend to express that there are qualitative similarities between the mental processes of dogs and humans, particularly in terms of emotional experience.

As social lubricants (Veevers, 1985), pets attract attention, have interpersonal appeal, provide a topic of conversation, and cause their owners to appear more approachable. Robins, Sanders, and Cahill (1991) observed dog owners at a public park, noticing that the presence of dogs elicited responses from strangers and aided in the establishment of interpersonal trust. McNicholas and Collis (2000) found the presence of a pet dog to be associated with significantly more interactions with strangers. Pets in the workplace have also been associated with facilitated social interaction (Wells and Perrine, 2001), and Wells (2004) found that a Labrador puppy elicited significantly longer conversations from passersby than a teddy bear or a potted plant. Other authors have suggested that pets not only act as social lubricants, but may also serve as catalysts for social networks (Wood & Giles-Corti, 2005; Wood, Giles-Corti, Bulsara, & Bosch, 2007).

Roth (2005) offers a new psychodynamic perspective on pet ownership designed to counter the previous tendency of analytic literature to diminish or even pathologize the role of human-animal relationships. Roth considers the adaptive function of humans sharing their psychic environment with animals as they engage in nonverbal communication with their pets. Pets are able to share in our sensory and emotional experiences, and to convey meaning through behaviors, touch and play. They appear to understand and respond to gestures, tone of voice, and emotional expressions and respond to separation and loss. Pets bond to their owners just as intensely as their owners bond to them.

"The more people I meet the more I like my dog"

-Unknown

Personality characteristics of pet owners. Early authors investigating personality differences between pet owners and non-owners tended to associate pet ownership with poor psychological health, lending support to the stereotype that pet owners prefer their pets to people and are often isolated or even anti-social. Cameron and Mattson (1972) believed that the idealization of a pet "seems to function as a detriment to effective social relationships and consequently to the person's mental health" (p. 286). Boris Levinson (1978) had a more positive view of the role pet ownership may play in personality development, believing that pet ownership in childhood is related to the development of empathy, self-esteem, self-control, and autonomy; he perceived human attitudes towards and treatment of animals as closely paralleling their attitudes towards and relationships with people.

Kidd & Kidd (1980) found that pet ownership was associated with lower levels of aggression, and Guttman (1981) found a greater tendency for pet owners to avoid loneliness and being alone relative to non-owners. Guttman also observed that non-owners show a greater tendency to be independent and to avoid lasting obligations, whereas the idea that a pet may restrict personal freedom rarely even occurred to pet owners. Hyde, Kurdek, and Larson (1983) found that pet owners were marginally higher on empathy and significantly higher on interpersonal trust relative to non-owners, and Paden-Levy (1985) found negative correlations of neuroticism and alienation with pet ownership. Marks, Koepke, and Bradley (1994) found a positive relationship between

pet owners' attachment scores and their scores on a measure of generativity, considered to be a measure of how concerned individuals are for the next generation and also seen as related to nurturance. On the other hand, Brown and Katcher (2001) found a significant association between high attachment scores and clinical levels of dissociation among a group of female veterinary technician students. It may be that moderate levels of attachment are most associated with the psychological health of pet owners, with both low and high attachment scores – especially at their most extreme – associated with negative outcomes related to pet ownership.

Gaps in the literature. While this review included some empirical studies with longitudinal designs, control groups, and large sample sizes (particularly epidemiological studies), there is regrettably a continuing reliance on small sample sizes, anecdotal findings, and retrospective reports. Also, though most experimental research designs include some type of control group, not all studies of pet ownership have included non-owner groups for comparison. Just as importantly, other demographic variables have not consistently been controlled for in many studies. There are clearly factors such as socioeconomic status, living arrangements, and household composition (to name just a few) that are associated to varying degrees with pet ownership as well as with varying levels of attachment to pets and thus also with the potential benefits of pets.

Hines and Frederickson (1998) cite the National Institutes of Health regarding the best way to proceed in research in a field that has primarily relied on anecdotal or qualitative research and case studies, which bears repeating here:

> Methodologies for future research can begin without explicit hypothesis and proceed from descriptive studies of representative and, hopefully,

> random samples. There is nothing intrinsically wrong with extrapolating from attitudinal information as long as the sample is representative of the target population. It should be remembered that samples of convenience are prone to bias, and interpretation must be limited and made with great care. If the hypothesis is supported, research cold proceed to cross-sectional and retrospective studies and then to long-range prospective investigations. A causal association between animal contact and human health can be demonstrated only by prospective studies. (National Institutes of Health, 1998, p. 5) (In Hines & Fredrickson, 1998, p. 33)

Wilson and Barker (2003) also note the lack of evidence-based practice in the field of animal-assisted therapy and a prevalence of hypothesis-generating rather than hypothesis-testing studies. There is especially a need for researchers to exercise more caution in attributing causality to correlational findings, and to avoid making inappropriate generalizations based on results from homogenous samples. Future studies should also control for interactive demographic variables such as gender, age, and socioeconomic status. It is also common to rely on "convenience samples" such as participants already known to have dogs, or residents of a particular nursing home. Another common problem is nonresponse bias, as there may be different characteristics associated with dog owners participating in a study and those who elect not to participate. Previous studies have also demonstrated little description of the content and process of interventions, and there is an overall need for more follow-up measurements and long-term studies.

There continue to be problems in terms of small sample size, lack of randomization, lack of a control or "usual care" group, inadequate control groups, selection bias, poor generalizability, minimal reporting of the reliability and validity of tools used to measure outcomes, and attrition rates (Morrison, 2007). There is also a lack of agreement in terminology and lack of consistency in the instruments being used (Steed

& Smith, 2003), and a need to distinguish between transient emotional responses and lasting change (Mallon, 1992). Finally, the hypotheses frequently cited as proposed underlying mechanisms of the benefits of pet ownership or AAA/AAT have rarely been directly tested. One hypothesis of the current study is that pet dogs may serve as a buffer against the impact of negative mood through the mechanisms of attachment and nonevaluative social support; therefore, the final section of the literature review is a consideration of the theoretical bases for changes in mood and the factors that may have an impact on mood.

How does mood change? Before determining how the presence of a pet dog can impact mood or serve as a buffer against negative mood, it will be helpful to define the construct of mood as it is being used in this context. Some authors use the terms mood, emotion, and affect interchangeably (Neumann, Seibt, & Strack, 2001; Westermann, Spies, Stahl, & Hesse, 1996); however, many authors differentiate between mood and emotion, with both terms falling under the larger umbrella of affect. Affect is generally described as whatever a person is experiencing or feeling, whether pleasant or unpleasant; it has varying degrees of intensity and duration and can be triggered or activated in a variety of ways (Humrichouse, Chmielewski, McDade-Montez, & Watson, 2007). Emotions consist of a subjective experience, a physiological reaction, an expressive component, and a behavioral response, whereas moods are similar to the subjective components of emotions. However, moods additionally include an array of low-intensity states and mixed states that are not traditionally considered to represent emotions (such as fatigue, confusion, etc.).

While emotions are short-term reactions to events or stimuli in the environment, moods are "rather diffuse affective states that subtly affect our experience, cognitions, and behavior" (Wilhelm & Schoebi, 2007, p. 258). Moods can be experienced passively, tend to last for some time, and are difficult to "shake off" (Parrott, 1991, p. 50). Also, while emotions presuppose that one knows the origin of the affective feeling, moods do not necessarily hinge on that knowledge (Neumann et al., 2001). Most previous studies of mood have addressed the consequences or concomitants of mood rather than what brings about a mood state (Pignatiello, Camp, Elder, & Rasar, 1989), but understanding how mood changes is important when carrying out research that relies on the effectiveness of a mood induction procedure.

Since moods tend to be viewed as subjective affective states, Mood Induction Procedures (MIPs) are generally evaluated in terms of their ability to elicit a change in self-reported mood in the desired direction. Mood is typically measured either on a bipolar continuum between positive and negative affect states or with respondents rating their degree of agreement or disagreement with regard to how much they are experiencing specific mood states; a growing body of literature suggests that positive and negative affect states are actually independent constructs rather than opposite ends of a continuum (Parrott, 1991), though regrettably there is still a good deal of variability and relatively little consensus regarding how to define and measure specific mood states. Depression is postulated to result from thoughts involving unfulfilled expectations, loss, and failure, whereas anxiety results from thoughts that anticipate danger or unpleasantness. Sadness occurs when there is a failure of a major plan or loss of an

active goal, whereas anxiety occurs when self-preservation is threatened (Martin, 1990, p. 679). Overall, negative mood inductions tend to produce larger effect sizes than positive mood inductions (Westermann et al., 1996).

Cognitive theories of mood change tend to dominate the literature, with Martin (1990) relating mood states to thought processes. Many MIPs rely on the theory that changes in thought patterns elicit mood shifts, with the most commonly used MIP requiring participants to read a set of 60 self-referent statements designed to trigger a particular mood state (elated, depressed, anxious, or neutral) (Velten, 1968). However, other authors argue that the explicitness of the directions to maintain a particular mood state may create demand effects among participants in MIPs (Larsen & Sinnett, 1991), and that cognitive MIPs are likely to induce multiple moods rather than discrete mood states (Polivy, 1981). Other cognitive methods of mood induction include remembering past unpleasant events, listening to a taped depressing story, or being given failure feedback on a task (Goodwin & Williams, 1982).

Depressed mood has been associated with learned helplessness and self-perceptions of defeat and/or entrapment (Gatchel, Paulus, & Maples, 1975; Pittman & Pittman, 1979, 1980; Goldstein & Willner, 2002), and most authors support the notion of a reciprocal relationship between cognition and mood. In cases of clinical depression, this becomes part of a vicious circle with negative cognitions triggering more depressed mood, and depressed mood leading in turn to further negative cognitions (Teasdale & Fogarty, 1979). Memories of unpleasant experiences induce depressed moods (Brewer, Doughtie, & Lubin, 1980), and negative memories are also more accessible when

participants are in a depressed mood (Rholes, Riskind, & Lane, 1987). Depressed mood has also been associated with failure to meet one's own standards as well as failure to meet externally imposed duties or standards (Goldstein & Willner, 2002). Self-focused attention has been hypothesized to initiate, maintain, and exacerbate depression (Scheier & Carver, 1977; Pyszczynski & Greenberg, 1987; Green, Sedikides, Saltzberg, Wood, and Forzano, 2003); "the more self-referencing and/or self-evaluating a mood induction system is, the more likely an intense and meaningful emotional mood state will be produced" (Seibert & Ellis, 1991, p. 121).

Physiological factors may also underlie changes in mood, from seasonal changes in light (Park, Kripke, & Cole, 2007) to the direct physical manipulation of facial expressions in the laboratory (Laird, 1974). High negative affect is correlated with physical problems, and low positive affect is additionally associated with health complaints (Clark & Watson, 1988), though causal direction cannot necessarily be inferred in studies observing a relationship between mood states and physical health; as with cognition, it seems likely to be a bidirectional relationship, as depression is often associated with poor physical health. Depressed mood has been associated with saturated fat intake (Anton & Miller, 2005), lack of physical activity, not eating breakfast, irregular sleep hours, not using a seat belt (Allgöwer, Wardle, & Steptoe, 2001), and alcohol use (Parker, Parker, Harford, & Farmer, 1987; Armeli, Tennen, Affleck, & Kranzler, 2000; Steptoe & Wardle, 1999), though there tends to be a great deal of variability between individual responses and even within individuals, suggesting that personality factors and individual differences also need to be considered when considering influences on mood.

Monoamine depletion is indirectly related to depressed mood, but is likely to represent a vulnerability trait rather than a causal factor (Ruhé, Mason, & Schene, 2007), and hypoglycemia has been shown to induce negative mood, tension, and fatigue (Gold, MacLeod, Frier, & Deary, 1995).

Personality variables that interact with changes in mood include sociability (with sociable rather than impulsive extraverts tending to demonstrate more positive affect), while more emotionally reactive and interpersonally sensitive individuals and those with lower self-esteem are more likely to report negative mood (Emmons & Diener, 1985). In one mood induction study, neurotic subjects tended to demonstrate heightened emotional reactivity to a negative mood induction, whereas extraverts tended to demonstrate heightened emotional reactivity to a positive mood induction (Larsen & Ketelaar, 1991). Individuals with high discrepancies between their actual and ideal selves tend to express more sadness and dejection (Higgins, Bond, Klein, & Strauman, 1986), and individuals with lower self-esteem are more likely to lower their self-evaluations after a negative mood induction (Brown & Mankowski, 1993). Therefore, individual differences in personality also need to be considered when evaluating the impact of MIPs.

The Current Study

Considering the preponderance of models in the field promoting attachment and social support as likely mechanisms for the beneficial effects of dog ownership, these constructs were selected as the theoretical framework for the current study as well. However, even within the construct of social support, different means of enhancing social

support have been suggested. Some authors posit a direct positive effect of social support provided by dogs through the provision of companionship and comfort (Rosenkoetter, 1991; Siegel, 1993; Beck & Katcher, 2003), while others suggest an indirect role with dogs either acting as "social lubricants" to facilitate social interactions with other humans or acting as buffers against the adverse impact of stressful life events (Wells, 2007). It is quite possible, of course, that dogs play multiple beneficial roles for their owners, and that interactions between characteristics of individual dogs and individual owners contribute in determining the potential benefits for *both* members of the dyad. However, for the sake of attempting to clarify the particular relationship between social support and attachment among dog owners, and more specifically the potential role of the pet dog in buffering against stress, a more limited framework must be used.

First of all, very few previous studies have actually involved a direct assessment of the presence of a pet dog on individual owners' emotional states or moods, at least not in a neutral setting. Usually such studies, when conducted at all, involve assessing the owners in their homes with their pets or rely on retrospective reports. There is a general problem with conducting studies in owners' homes, as there is much more variability introduced through differences between their homes and the control of extraneous variables is also more difficult.

In contrast, in a neutral setting such as a laboratory or similar meeting room, the environment will be more standard. Most laboratory studies that have asked owners to bring in their own dogs have examined primarily physiological measures in relation to the presence of the pet dog. Also, they tend to employ within-subjects repeated measures

designs, having participants serving as their own "controls" by being assessed with and without their dog.

If previous studies have generally found that pet dogs may serve to buffer against the physiological effects of stress and anxiety, and there have been inconsistent findings with regard to the impact of pet ownership on self-esteem and depression, perhaps the presence of a pet dog will have a favorable effect on mood. The central question being asked is whether or not pet dogs can serve as a buffer against the effects of a negative mood induction procedure administered in a neutral, laboratory-like setting. Rather than using within-subjects comparisons, participants were recruited from the general community of single female dog owners and single females without dogs, with dog owners randomly assigned to a dog-present or dog-absent condition.

The presence of a non-owner group not only serves as an additional source of control, but also allows for comparisons between characteristics of dog owners and non-owners at baseline. Attachment to pets and social support were assessed, in addition to depression, self-esteem, and general attitudes towards pets. Demographic information was collected regarding pet ownership, employment, education, relationship status (all women were not co-habiting with partners or married; however, some were dating), living situation (some had roommates; though some had adult children, none currently lived with children), age, and geographical location. All demographic variables were assessed in relation to pet ownership to determine whether there were any demographic differences between pet owners and non-owners that might have an effect on the interpretation of the results.

The author's primary hypothesis was that among dog owners, the presence of the pet dog would result in a significantly smaller magnitude response to the administration of a negative mood induction. The negative mood induction was expected to result in decreases in self-reported happiness and self-esteem, and increases in self-reported sadness and despondency. Other moods (irritability, fatigue, anxiety, and apprehension) were included to test for the specificity of the mood induction procedure, with the hypothesis that these measures of mood would not change significantly from before to after the mood induction procedure. The mood induction was also expected to contribute to slower performance on a writing speed task. No specific hypotheses were made regarding the non-owners' response to the negative mood induction, though it was suspected that they might exhibit an intermediate degree of responsiveness somewhat greater than that of dog owners with their dogs present, but less than that of dog owners without their dogs (who could be perceived of as being deprived of the benefit of their dogs' presence).

Secondary hypotheses included that an association would be found between dog owners' attachment levels to their dogs and their responses to the negative mood induction, so that buffering effects would be more evident among more highly attached owners with their dogs present. It was also hypothesized that dog owners with their dog present at the follow-up might demonstrate higher positive mood and self-esteem and lower negative mood *prior* to the mood induction procedure, as well as demonstrating more rapid and accurate performance on a writing speed task, and that this effect might

be enhanced among dog owners with stronger attachments or more positive attitudes towards their dogs.

Though past studies of the relationship between attachment and social support have been mixed, it was also hypothesized that dog owners with higher attachment scores might have higher self-perceived social support, as well as lower depression scores and higher self-esteem scores. It was also hypothesized that non-owners with more positive attitudes towards pets might have similar advantages on measures of self-perceived social support, self-esteem, and depression. Finally, though again previous results have been mixed, it was considered that there might be a significant difference between dog owners and non-owners at baseline on measures of self-esteem, social support, and depression.

Method

Participants

Sixty-six women ranging in age from 19 to 76 years (mean age 43 years; women over the age of 65 were only included if they were still in the work force at least part-time) were recruited for participation in three different geographic areas, using flyers posted on university campuses, at dog runs, veterinary offices, post offices, dog day care and grooming facilities, libraries, and on internet websites such as craigslist and mailing lists for dog owners. Additional participants were also recruited by word of mouth. Participants were living in the New York City metropolitan area, the Hudson Valley in New York State, or the Shenandoah Valley in Virginia. Separate flyers were designed for dog owners and for volunteers without pets, though aside from the initial heading

(either "Dog Owner?" or "No Pets?") the information given to potential participants was identical. The flyers asked that respondents be female, single (not married or living with a partner; dating was fine), not living with children, and between the ages of 18 and 65, though as mentioned older adults who wanted to participate were included provided that they were still active in the work force on at least a part-time basis. Forty-four women owned at least one dog; some owned other pets as well. Twenty-two women did not own any pets. All participants were offered the opportunity to enter in a raffle prize drawing for cash prizes (1 $100 prize, 2 $50 prizes, and 4 $25 prizes); students could also receive course credit.

Materials

Prescreening measures. Trait measures of depression (The Beck Depression Inventory – II [BDI-II] [Appendix A] [Beck, 1996]) and self-esteem (The Rosenberg Self-Esteem Scale [Appendix B] [Rosenberg, 1965, 1989]), as well as the Multidimensional Scale of Perceived Social Support (MSPSS) (Appendix C) (Zimet, Dahlem, Zimet, & Farley, 1988), were administered to all participants. The Beck Depression Inventory – II is a 21-item self-report rating inventory presented in multiple choice format which measures the presence and severity of depression in adolescents and adults (Beck, 1996). Though the original inventory is over forty years old (Beck, Ward, Mendelson, Mock & Erbaugh, 1961), the Beck Depression Inventory – II (BDI-II) has been revised multiple times and continues to demonstrate high internal consistency, split-half reliability, and content validity (Beck, 1996).

The Rosenberg Self-Esteem Scale (Rosenberg, 1965, 1989) (Appendix B) is one of the most frequently used measures of global self-esteem, consisting of ten statements related to overall feelings of self-worth or self-acceptance. The items are answered on a four-point scale ranging from strongly agree to strongly disagree. Test-retest correlations are typically in the range of .82 to .88, and Cronbach's alpha for various samples are in the range of .77 to .88 (Blascovich & Tomaka, 1993). Self-esteem is strongly negatively correlated with depression, and is a good indicator of psychological well-being.

The Multidimensional Scale of Perceived Social Support (MSPSS) (Appendix C) (Zimet et al., 1988) measures perceived social support using a 7-point Likert-type scale ranging from 1 (very strongly disagree) to 7 (very strongly agree) and includes factor groups relating to the source of social support (family, friends, or significant other). Since previous studies have reported mixed and even inconsistent results regarding the relationship between pet ownership and perceived social support, this measure is included to assess for relationships between pet ownership, pet attachment and social support. While some authors have attempted to add on to this measure with pet-related items, in this study separate measures were used for pet attachment and attitudes towards pets.

All participants also completed a scale to assess their attitudes towards animals. The 18-item Pet Attitude Scale (PAS) (Templer, Salter, Dickey, Baldwin, & Veleber, 1981) (Appendix D) has been shown to have an inter-item reliability of .93 and a test-retest reliability of .92. It has been compared to scores on the Marlowe-Crowne Social Desirability Scale and an acquiescent response measure, with nonsignificant correlations less than .20, and has been found to differentiate successfully between kennel workers

and social work students. Items are scored on a 7-point Likert-type scale, with some items reverse scored to assess negative as well as positive attitudes towards pets. It was expected that the pet owners would display more positive attitudes towards pets, and that a higher score on the PAS might also be associated with decreased responsiveness to the mood induction procedure for participants in the dog-present group.

In addition, dog owners completed a brief scale that measures the quality of attachment to their pets. The Comfort from Companion Animals Scale (Zasloff, 1996) (Appendix E) is an 11-item measure for assessing the perceived level of emotional comfort that owners receive from their pets. Responses are based on a Likert scale from 1 (strongly disagree) to 4 (strongly agree). Inter-item reliability for the pilot administration was .85 ($p < .01$). This measure was included to assess the possibility that dog owners who are more attached to their pets are also more likely to benefit from their presence.

Experimental measures. The primary experimental manipulation was the use of a musical mood induction procedure to induce negative mood in the laboratory setting. Martin (1990) describes the use of music as an instrument of mood induction, with participants being asked to use music to aid in their own efforts to get into a depressed, elated, or neutral mood. This type of induction has been shown to affect both self-report measures of mood, particularly Visual Analogue Mood Scales (VAMS) (Appendix G), and psychomotor measures known to be affected by depression. Psychomotor measures of mood are less susceptible to demand effects than self-report measures of mood. In addition, music induction techniques have been shown to increase depression without

increasing anxiety, whereas other techniques often increase depression *and* anxiety. Also, music induction is usually successful in inducing the relevant mood over 75% of the time, in contrast to another commonly used procedure called the Velten Mood Induction Procedure that has only a 50% success rate. Finally, mood induction procedures are less time-consuming than other procedures, typically lasting less than ten minutes.

The most common musical mood induction for depressed mood is a recording of "Russia Under the Mongolian Yoke" from the film *Alexander Nevsky* composed by Prokofiev and played at half speed (Clark & Teasdale, 1985; Parrott, 1991; Slyker & McNally, 1991). Visual Analogue Mood Scales (VAMS) were used as the self-report measure of mood before and after the mood induction procedure. Though there are several different formats used for visual analogue scales (Clark & Teasdale, 1985; Slyker & McNally, 1991; Goldstein & Willner, 2002; Green, Sedikides, Saltzberg, Wood & Forzano, 2003), the basic premise is that subjects are asked to place a mark on a horizontal line in relation to how they currently perceive their mood, with endpoints on the line either being two different mood states at opposite ends of a bipolar continuum (e.g., happy on one end and sad on the other), or each line being used to rate the experience of a particular mood state on a continuum with one end of the line being "not at all" and the other end of the line being "extremely." The latter method was used in the current study, with the moods "sad," "irritated," "happy," "anxious," "tired," "despondent," and "apprehensive." The mood induction was expected to result in a decrease in happy mood and an increase in sad and despondent mood; based on the

theory that the mood induction should only induce depressed mood rather than anxious mood, it was not expected to have an impact on anxiety or apprehension.

The psychomotor impact of depressed mood was measured in the present study using a writing speed task (Parrott, 1991). For this task, participants were asked to write a column of numbers counting backwards from 100, being stopped after sixty seconds; slower performance on the task is associated with depression, while more anxious participants make more mistakes. Finally, a state measure of self-esteem was included to assess the impact of the mood manipulation on self-esteem. Previous researchers have found positive correlations between high self-esteem and positive affect (Watson, Suls & Haig, 2002), as well as finding that subjects with high self-esteem are less susceptible to the effects of negative mood on self-evaluation (Brown & Mankowski, 1993).

Crocker & Wolfe (2001) suggest that global state self-esteem can be assessed with the same items used on a measure of global trait self-esteem such as the Rosenberg Self-Esteem Scale, with the items reworded to assess how the subject feels in the moment (Appendix F). According to Crocker & Wolfe, self-esteem is a crucial element in determining quality of life, as it is also closely related to positive affect and fewer symptoms of depression. They argue that rather than being a relatively stable trait, self-esteem varies in stability from person to person depending on what domains, or contingencies of self-worth, self-esteem is centered on. While most people do have an average level of self-esteem that can be measured as a personality trait, judgments of self-esteem may fluctuate around this level based on how an individual feels at the moment the judgment is made. Therefore, it was expected that the mood induction procedure

might impact self-report measures of self-esteem, and that the presence of a pet dog might additionally serve as a buffer against this effect.

Procedures

Upon contacting the researcher either by phone or by e-mail, participants were informed of the basic requirements of the study. They were told that two meetings would be scheduled, approximately one week apart (in some cases it was necessarily to wait more than a week, but at least one week passed between the baseline and follow-up measures in all cases), lasting approximately 15-20 minutes each. They were also informed that they would be filling out self-report measures at the first meeting, and that they would fill out some more self-report measures and "listen and respond to music" during the second session; they were told that the experimenter was interested in general differences between dog owners and non-owners on a variety of standard laboratory tasks.

Dog owners were additionally questioned to find whether or not they would be able to transport their dog to the study location (a university laboratory in New York, library meeting rooms or similar settings in the Hudson Valley, a church basement meeting room in Virginia), in order to ensure that the assignment of participants to the dog-present condition could be done completely randomly; they were additionally assured that their dog would not have to do anything as part of the study besides merely be present. Non-owners were screened to make sure they had not owned a dog within the past few years; it was not practical to eliminate previous ownership entirely, as the vast majority of non-owners had owned a pet at some point in their lives. At the first meeting, all participants were given informed consent forms to sign, after which they completed

the BDI-II, the Rosenberg Self-Esteem Scale, the Multidimensional Scale of Perceived Social Support, and the Pet Attitude Scale. Dog owners additionally completed the Comfort from Companion Animals Scale. Due to requiring two meetings, some participant attrition did occur; any results from participants only completing the first meeting were dropped from the study, as there were not enough cases to investigate differences between participants who returned and participants who did not, though there were geographic differences (five in New York City, three in the Hudson Valley, none in the Shenandoah Valley).

At the end of the first meeting, dog owners were randomly selected and informed whether or not they would need to bring their dog with them to the second meeting. At the follow-up, all participants completed the modified version of the Rosenberg Self-Esteem Scale, the writing speed task, and the Visual Analogue Mood Scale. Then participants wore headphones while listening to Prokofiev's "Russians Under the Mongolian Yoke" played at half speed for seven minutes. They were told simply to "try to get into the mood of the music," without the specific mood being named, in order to avoid demand characteristics. Finally, the participants completed the modified Rosenberg, the writing speed task, and the Visual Analogue Mood Scale a second time, followed by a debriefing and an opportunity to ask the researcher questions or to provide any observations or feedback to the researcher regarding their own perceptions of the mood induction procedure and, when relevant, the effect of their dog's presence.

It should be noted that the researcher used scoring methods on all measures using a Likert-type scale so that points were given for greater degrees of agreement on items

associated with positive measures of the construct being assessed, and points were subtracted for greater degrees of disagreement with these items; likewise, points were given for greater degrees of disagreement on items negatively associated with the construct being assessed, and points were subtracted for greater degrees of agreement with these items. For example, if someone endorsed an item positively associated with self-esteem, they would get one point for agreeing and two points for strongly agreeing. If someone endorsed an item *negatively* associated with positive attitudes towards pets, they would *lose* one point for agreeing, two points for agreeing strongly, and three points for agreeing very strongly. While the researchers' scoring methods were not always identical to standard scoring methods employed by the measures' authors, they were utilized consistently across all measures and were used to allow more direct comparisons between the different prescreening and experimental measures.

Statistical procedures for data analysis were conducted using SPSS version 17.0 and included multivariate analysis of variance with the independent factors of experimental condition and outcome measures of self-report and behavioral mood. Nonparametric Kruskal-Wallis tests were used rather than univariate ANOVA due to a high degree of non-normality of data. Nonparametric Mann-Whitney U tests were performed for pairwise comparisons. Chi-square was used to assess for any interaction between experimental group or dog owner status with the demographic variables of age, education, occupation, geography, living situation, and relationship status. Though interpreted with caution due to the nonlinear nature of many of the dependent variables, regression analyses were also used to test for interactions of any demographic variables

with the experimental group or dog owner status variables on the outcome measures. Finally, nonparametric correlations (Spearman's ρ) were examined to identify any associations between dependent variables, with a particular interest in measures of attitude towards pets (Pet Attitude Scale [PAS]), pet attachment (Comfort from Companion Animals Scale [CCAS]), and social support (Multidimensional Scale of Perceived Social Support [MSPSS]).

Results

Demographics

The overall demographics are summarized in Table 1. Since there was no statistically significant difference between groups for age (mean age for dog owners with their dogs was 42.68 years, for dog owners without their dogs 44.9 years, and for non-owners 41.64 years), age was recoded as a categorical variable since all the other demographic variables were categorical. Overall there were not any statistically significant differences between the experimental groups in terms of demographic variables. The random assignment of dog owners to the dog-present and dog-absent conditions was successful. Going forward, then, the results related to experimental group condition can be interpreted without concern for demographic factors acting as confounding variables.

The only demographic differences between dog owners and non-owners were occupation and household composition, with an association between dog ownership and occupation found primarily in relation to more working students not having dogs, and more dog owners working full-time (Chi square = 7.603, $p < .05$). In addition there was

an association between dog ownership and household composition, with dog owners being relatively more likely to live alone, and non-owners having more roommates (Chi square = 3.902, $p < .05$). Again, there were no reliable differences between the three experimental groups, so these demographic differences only need to be considered when interpreting overall differences between dog owners and non-owners.

[Insert Table 1 about here]

Experimental measures

The overall effect of the mood induction across all groups was as expected, with decreases in happiness ($t = 1.477$, $p < .05$) and increases in sadness ($t = -1.319$, $p < .05$) and despondency ($t = -1.603$, $p < .05$) after listening to the music. Self-esteem scores did not change significantly, however. The specificity of the mood induction procedure was also supported by a lack of significant change in measures of anxiety or apprehension; anxiety actually decreased slightly after the mood induction procedure. One unexpected finding was that the mood induction procedure was not successful in significantly altering participants' performances on the writing speed task, though of course it is quite possible that practice effects overwhelmed any impact of the mood induction procedure.

The first outcome measure that was significantly associated with dog owner status using the Kruskal-Wallis test was the change in apprehension ratings from before to after the mood induction procedure (Chi square = 3.902, $p < .05$). The result was supported by the Mann-Whitney U test ($U = 336.500$, $p < .05$). For dog owners, there was an average *increase* in apprehension scores of 2.92 (SD = 13.130) in response to the mood induction procedure; for non-owners, there was an average *decrease* in apprehension scores of

–4.93 (SD = 13.900) in response to the mood induction procedure. There was not a statistically significant difference between dog owners without their dogs and non-owners on this measure, so this effect only occurred for dog owners in the presence of their dogs (U = 157.000, $p < .05$). When other demographic variables were controlled for, owner status was still significant (β = -.255, t = -1.842, $p < .05$).

Among dog owners with their dogs present, changes in scores on the anxiety measure of the VAMS in response to the musical mood induction procedure differed significantly from those of non-owners (U = 139.500, $p < .05$), with the dog owners exhibiting increased anxiety in the presence of their dogs (M = 1.93, SD = 15.132), and non-owners exhibiting decreased anxiety (M = -6.66, SD = 16.234). Again, there was no significant effect of other demographic variables on this outcome measure. Dog owners with their dog present exhibited a similar pattern with changes in irritability, again with dog owners displaying increased irritability in response to the musical mood induction (M = -4.27, SD = 15.055) (U = 156.000, $p < .05$). This effect diminished when other demographic variables were entered into the equation (β = -.227, t = -1.842, p = .070), though it still approached statistical significance.

There were no statistically significant experimental group differences on the effect of the negative mood induction in relation to happiness, sadness, tiredness, despondency, self-esteem, or writing speed task performance. Overall, the main difference between non-owners and dog owners was increased apprehension, anxiety, and irritability scores among dog owners with their dog present relative to non-owners. The

scores of dog owners without their dogs present tended to fall in between the scores of dog owners with their dogs present and non-owners.

Due to the large number of outcome measures, a Bonferroni correction was used, so that only highly significant correlations between pet attitude and pet attachment and the outcome measures ($p < .001$) were considered; this was to limit the likelihood of spurious correlations and Type 1 errors. With this stringent criterion, however, no significant associations were found between measures of pet attitude or attachment and the outcome measures. However, some significant associations were found between measures of pet attitude and baseline measures of happiness.

Prescreening and baseline measures

Since this was not a clinical sample, the BDI-II was not administered with the intention of measuring clinical levels of depression (if participants were found to have clinical levels, they were offered a referral for mental health services), but rather to determine if there were any differences between dog owners and non-owners on low-level symptoms associated with depression and also to screen participants for depression prior to the administration of a negative mood induction procedure. The average BDI-II score across all groups was quite low ($M = 5.52$, $SD = 5.254$) and was not significantly different between dog owners and non-owners. However, the Mann-Whitney U test revealed a statistically significant difference between dog owners who were assigned to bring their dog and non-owners, with dog owners assigned to bring their dog scoring significantly lower on the BDI-II (i.e., having fewer depressive symptoms;

$U = 153.000$, $p < .05$). Since the BDI-II scores were also significantly different between the Hudson Valley and Shenandoah Valley ($U = 47.000$, $p < .05$), with higher scores associated with the Hudson Valley, and BDI-II scores were also significantly different between participants without a college degree and participants with a doctoral degree ($U = 16.000$, $p < .05$) with higher education associated with lower scores, geography and education were entered along with experimental group status into a regression model. With geography and education included in the model, experimental group was the only statistically significant predictor of the BDI-II score ($\beta = .287$, $t = 2.351$, $p < .05$).

The average score on the Rosenberg Self-Esteem Scale (RSE) across all groups was 12.91 (SD = 5.462; maximum possible score of 20 based on strong endorsements of positive statements and strong rejections of negative statements). There was not a statistically significant difference between experimental groups on this measure, though there was a trend for dog owners (M = 13.43, SD = 5.258) to have slightly higher scores than non-owners (M = 11.86, SD = 5.833). Not surprisingly, the prescreening measure of self-esteem was significantly positively correlated with the reworded experimental measures of self-esteem (RSE and self-esteem before the mood induction, $\rho = .634$, $p < .001$; RSE and self-esteem after the mood induction, $\rho = .501$, $p < .001$). The average score on the Multidimensional Scale of Perceived Social Support (MSPSS) across all groups was 18.55 (SD = 13.296; maximum possible score of 36). There was not a statistically significant difference between experimental groups on this measure, though there was a trend for non-owners (M = 21.64, SD = 10.399) to have slightly higher scores than dog owners (M = 17.00, SD = 14.390).

Not surprisingly, dog owners exhibited a significantly higher score on the Pet Attitude Scale (PAS) relative to non-owners, with the mean PAS score for non-owners being 21.64 (SD = 18.186; maximum possible score of 56), and the mean PAS score for dog owners being 41.45 (SD = 9.872) (U = 163.000, $p < .001$). There was no significant difference in PAS scores between dog owners who were assigned to the dog-present condition for the follow-up and those who did not bring their dogs to the follow-up. The Comfort from Companion Animals Scale (CCA) was only administered to dog owners, with an average score of 18.75 (SD = 4.947; maximum possible score of 22). Again, there was not a significant difference in scores between dog owners assigned to bring their dog with them to the follow-up and dog owners who did not bring their dogs with them to the follow-up. Among dog owners, PAS scores were highly associated with scores on the Comfort from Companion Animal Scale (CCA) ($\rho = .711$, $p < .001$).

Overall, higher PAS scores were positively associated with measures of happiness *prior* to the negative mood induction ($\rho = .402$, $p < .001$). There was also a nonsignificant trend for dog owners with their dogs to be somewhat less sad (M = 10.41, SD = 18.78) than dog owners without their dogs (M = 12.52, SD = 21.118), and for dog owners without their dogs to be somewhat less sad than non-owners (M = 18.23, SD = 20.908) prior to the mood induction procedure. However, this difference was not statistically significant, and there was not a difference in how they responded to the music.

Among dog owners with their dogs present, scores on the reworded self-esteem measure were significantly higher than for non-owners prior to the negative mood

induction (U = 158.000, $p < .05$), with the average score for dog owners with their dog present being 17.55 (SD = 2.738), and for non-owners 14.50 (SD = 5.280). This association was also maintained when controlling for other demographic variables. Despondency ratings on the VAMS prior to the negative mood induction procedure were significantly lower for dog owners with their dogs present (M = 4.32, SD = 4.031) relative to non-owners (M = 15.48, SD = 18.635) (Chi square = 3.532, $p < .01$). Despondency ratings on the VAMS prior to the negative mood induction procedure were also significantly lower for dog owners without their dogs (M = 7.61, SD = 8.396) relative to non-owners (Chi square = 3.544, $p < .05$). Only experimental condition was a significant predictor of this measure ($\beta = .360$, $t = 3.172$, $p < .01$).

Finally, apprehension ratings on the VAMS prior to the negative mood induction procedure were significantly lower for dog owners with their dogs (M = 10.02, SD = 16.650) and without their dogs (M = 6.77, SD = 6.254) relative to non-owners (M = 19.95, SD = 24.706) (F = -8.800, $p < .05$). Both household composition and relationship status affected the association between dog ownership and apprehension ratings. The effect of owner status was only significant for participants who were living alone (F = 19.430, $p < .001$), and was not significant for participants with roommates. Similarly, the effect of owner status was only significant for participants in a relationship (F = 7.544, $p < .05$), and not for participants who were single. When experimental group, relationship status, and household composition were entered in a regression equation, only relationship status significantly predicted apprehension ratings prior to the negative mood induction ($\beta = .328$, $t = 3.027$, $p < .01$). When owner status and relationship status were

entered into a regression equation, they accounted for approximately equal proportions of variance in one model, but it was not a very strong predictor (Eigenvalue = .113, variance proportions for owner status = .49, for relationship status = .48).

[Insert Table 2 about here]

"A good dog deserves a good home."

-Proverb

Discussion

Though this study may still have failed to address the commonly-occurring problem of limited generalizability of findings due to its reliance on a somewhat small sample size and use of a fairly homogenous population (though drawing from different geographic areas, sampling from a wide range of ages, and using a community sample rather than a clinical sample), its strengths lie in its consideration of mood variables as outcome measures, its careful consideration of demographic factors, its presence of control groups both for testing the effect of dog ownership in general and for the effect of the presence of a pet dog in particular, and its use of standardized measurements.

In addition, while both within-participants and between-participants models have their place in research on the effects of dog ownership and the characteristics of dog owners, the tendency has been to rely primarily on within-participants designs. Additionally, measures of attitudes towards pets were included for both dog owners and non-owners, and the effects of levels of attachment to one's pet were assessed. Of course, as tends to be the case when studying the human-companion animal bond, random

assignment to dog owner and non-owner conditions was impractical, though random assignment to the dog present and dog absent conditions was done.

It was not surprising to find that working students were less likely to have dogs, considering the limitations on their time and the financial responsibilities involved in caring for a dog, whereas dog owners were more likely to be working full-time but not in school. Dog owners were also more likely to live alone than with roommates; previous studies have suggested that pet ownership is more beneficial for owners who have fewer other sources of social support. Though the general trend is for dog owners to live with families, the present study was only looking at single women, so it may not be that surprising that among single women, pet ownership is more likely when they live alone.

What was surprising is that the mood induction main effects did not differ significantly between the experimental groups, as the primary hypothesis suggested. While the mood induction overall had the expected effect on happiness, sadness, and despondency, it did not impact self-esteem or performance on the writing speed task. In addition, dog owners with their dogs became significantly *more* anxious and apprehensive after the negative mood induction relative to non-owners; while it was initially expected that non-owners' scores might fall between those of dog owners with their dogs and dog owners without their dogs, it turned out that the scores of dog owners without their dogs fell between those of dog owners with their dogs and non-owners.

It appears that the demands of this particular experimental paradigm were such that the presence of a dog distracted from the task and exacerbated anxious and apprehensive responses to the negative mood induction. The owners may have had

difficulty focusing on the music in the presence of their dogs; they may also have been concerned for how their dogs were adjusting to a novel environment. There were also few relationships between levels of pet attachment and attitude towards pets and the outcome measures, with none reaching stringent criteria for statistical significance. However, the dog owners all tended to have very high PAS and Comfort from Companion Animals Scale scores, limiting the possibility of finding differences in outcome measures in relation to variations on these measures.

Interestingly, participants who had more positive attitudes towards pets in general tended to report feeling happier *prior* to the negative mood induction. This occurred regardless of the presence of a pet dog, suggesting that there may be mood-enhancing qualities associated with positive views of pets in general, or perhaps that people who see pets more positively tend to feel more positively about other things as well. Dog owners had initially lower levels of despondency and apprehension prior to the negative mood induction, regardless of the presence of their dogs, though the difference in apprehension only occurred for dog owners who were living alone or dating.

It is not surprising that dog ownership might confer a greater advantage among single women living alone; while not discussed in the results section as it did not have a direct bearing on the current research question, participants who were dating reported *higher* initial apprehension scores overall, but the scores were significantly lower for dog owners. Dog owners with their dogs also reported significantly higher self-esteem prior to the mood induction, suggesting that the dog owners felt initially more positive in the

presence of their dogs, even if their dogs' presence was associated with increases in apprehension and anxiety subsequent to the negative mood induction procedure.

It is hard to know what to make of the lower incidence of depressive symptoms among only the group of dog owners that brought their dog with them to the follow-up, as assignment to the dog condition was random, and the BDI-II was administered prior to this assignment. Most likely, considering the relatively large number of variables and the relatively small number of participants, this correlation was spurious. No demographic variables could account for it, but the correlation would disappear if outlying scores on the BDI-II among non-owners were eliminated.

Also, although there was not an overall association between BDI-II scores and age, the one outlying score in the group of dog owners without their dogs was also the oldest participant (76 years old, though still active in the work force), and she even stated to the researcher that she felt most of her positive responses to items on the BDI-II were related to her age. If her score was eliminated, there may have been an overall effect of dog owner status on the BDI-II, not merely for dog owners who brought their dogs with them to the follow-up.

In an attachment framework, the benefits of being attached to a pet may appear even in the absence of the pet, as suggested by the lower initial despondency and apprehension scores among dog owners prior to the negative mood induction procedure. Participants with positive attitudes towards pets overall also reported higher levels of happiness prior to the negative mood induction procedure, and dog owners with their dogs reported higher self-esteem prior to the negative mood induction procedure. Rather

than serving to buffer against the effects of the negative mood induction, however, the presence of pet dogs exacerbated feelings of anxiety and apprehension. Understanding the specific circumstances in which pets can be positive distractions and sources of support, rather than negative distractions and sources of anxiety, would be one additional goal for future research.

Another factor that has not been addressed adequately is how the behaviors of pets can impact the degree of attachment that their owners experience. James Serpell (1996) found that less-attached owners tended to be dissatisfied with various aspects of their pets' behaviors. Since pet owners express varying expectations with regard to expressions of affection from their pets, assessing the degree to which pets meet their owners' expectations may be a significant factor in predicting attachment and the successful formation of a lasting human-animal bond (Kidd, Kidd, & George, 1992). This is particularly important considering the frequency of pet relinquishment and the number of pets that are in shelters or on the streets (Salman, New, Scarlett, Kass, Ruch-Gallie, & Hetts, 1998; New, Salman, Scarlett, Kass, Vaughn, Scherr, & Kelch, 1999; Scarlett & Salman, 1999; New, Salman, King, Scarlett, Kass, & Hutchison, 2000; Kass, New, Scarlett, & Salman, 2001).

The relationships between pet ownership, attachment, and social support are also connected to the biophilia hypothesis and empathy. The biophilia hypothesis suggests that human beings not only benefit from contact with the natural world but are also deprived by an absence of contact with the natural world. Developing attachments to pets as well as to other human beings is likely to provide emotional as well as physical

benefits, and pets provide a special quality of social support due to their nonevaluative nature. The relationship between empathy and the human-animal bond is also deserving of further consideration, as relatively few studies have touched on this construct (McPhedran, 2009). Since humans communicate with their pets without language, and the ability to communicate emotionally is at the core of empathic responses, it is quite possible that our relationships with companion animals and our connection to the natural world are important in the development of empathy. Empathic responding is also at the core of effective social support, and may be related to stronger attachments as well; a greater understanding of empathy in human-animal interactions is desirable.

The establishment of a bond is clearly important to the welfare of companion animals as well as to their owners (Friedmann & Son, 2009). Understanding the factors that contribute to this bond is an ongoing project in the field of human-animal interactions. While this study suggests that dog owners who have more positive attitudes toward their pets and are more attached to their pets may derive some benefits from this attachment, more longitudinal studies are needed to understand how the bonds are formed and what factors contribute to predicting the strength of the bonds, as well as what risk factors may predict the failure of a bond to form or the breaking of a bond. Again, people seek different qualities in their pets as sources of companionship and comfort, so a greater understanding of how both human and animal qualities contribute to the bond is needed as well. Some dog owners prefer a more active and energetic dog, others prefer a calmer dog; some dog owners prefer large dogs, and others prefer small dogs.

"Greater cooperation is necessary between psychologists and applied ethologists to develop methods for scoring and assessing the interactions between humans and animals, and the effects of poor relationships" (Appleby & Hughes, 1993, p. 394). In order for the field to progress in answering questions regarding the qualities necessary in the establishment of a successful human-animal bond, there is a need for greater standardization of instruments used to assess factors such as attachment, social support, and other qualities perceived as benefits or correlates of pet ownership. While the current study used instruments that had been used previously in the context of human-animal bond research (with the exception of the mood induction and the VAMS), there is still a general lack of consistency, with some authors making up their own measures of pet attachment and attitudes towards pets, and others selecting from a veritable hodgepodge of instruments. Appleby & Hughes additionally suggest a greater use of developmental and longitudinal studies.

Finally, to conclude where we began, Boris Levinson's (1982) suggestions for future research are just as germane today as they were twenty-seven years ago. While a huge body of research has been published, there is still a lack of clear terminology in defining the field (anthrozoology, a study of human-animal interactions, an investigation of the human-companion animal bond . . .). Though clearer theoretical frameworks are developing related to attachment theory, social support, and the biophilia hypothesis, there is still no unifying theoretical model. While some qualitative research is helpful in generating new hypotheses, there is still insufficient empirically sound work being done. There is more attention now to cultural factors, though this area of study is rather slim,

and the scarcity of longitudinal research makes it difficult to draw conclusions relating companion animal ownership to the development of human personality. How we communicate with animals has scarcely been studied, though the suggestion that nonverbal communication is primarily emotional in nature and related to empathy is an important one. The major goal that has been met since Levinson's article is that a huge body of research has been built around the concept of animal-assisted therapy, but while this research is very rich in its observations regarding specific clinical populations, the typically small and homogenous samples make it virtually impossible to generalize beyond specific groups and settings.

While this study was able to provide some more evidence supporting the importance of dog ownership in the general community, with some associations between dog ownership and self-esteem, and additional evidence supporting the association of positive attitudes towards pets with happiness, it also indicated that there are some situations where the presence of a pet dog may increase apprehension and anxiety. Also, generalizability is an ongoing problem in the field, with self-selected participants, the inability to randomly assign participants to a dog ownership condition, reliance on samples that are either too homogenous (so that results may not apply to samples with different demographic compositions) or too heterogeneous (so that demographic factors are not sufficiently controlled), and small sample sizes. Still, it appeared that the dog owners who participated in this study almost universally expressed high degrees of attachment to their pets, so that the role of attachment and social support should continue

to be considered as important variables in the establishment and maintenance of the human-animal bond.

Future research assessing the impact of the presence of companion animals may want to more carefully control for the presence of the experimenter as well, by at the very least having research protocols that involve an experimenter who is blind to the hypothesis, and ideally having the researcher outside the room altogether for as much of the time as possible. Considering that dogs impact caregivers and nursing staff in addition to patients, it is not unlikely that the presence of a dog will have an effect on experimenters, which cannot help but have some influence on the participants as well. Another possible explanation of the dog owners' anxiety and apprehension in this study may have been that they were worried how their dog was reacting in the presence of a stranger, or were concerned what the experimenter thought of their dog's behavior. Also, conducting a mood induction study using neutral music that has not been shown to have a significant impact on participants' moods could be used as a control condition to see if dog owners with their dogs present become more anxious regardless of the type of music they are listening to. Finally, a "happy" music condition would help determine if the anxiety and apprehension occur regardless of the affective content of the music, and would also assess for the possibility that rather than buffering against negative mood, the presence of a pet dog may enhance positive mood.

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Table 1

Demographic Variables by Owner Status and Experimental Group

	Geography		
Group	New York City	Hudson Valley	Shenandoah Valley
Dog owner	21	8	15
With dog	9	3	10
Without dog	12	5	5
Non-owner	13	1	8

	Age					
Group	<26	26-35	36-45	46-55	56-65	>65
Dog owner	8	10	4	8	11	3
With dog	3	7	2	3	7	0
Without dog	5	3	2	5	4	3
Non-owner	6	3	3	3	5	2

	Education				
Group	> H.S.	BA/BS	> BA	MA/MS/MFA	PhD
Dog owner	8	15	4	14	3
With dog	3	8	4	6	1
Without dog	5	7	0	8	2
Non-owner	4	5	4	5	4

	Occupation				
Group	Student	Working student	Part Time	Full Time	None
Dog owner	4	3	2	30	5
With dog	3	2	1	14	2
Without dog	1	1	1	16	3
Non-owner	2	7	0	11	2

	Household		Relationship Status	
Group	Alone	Roommate(s)	Single	Dating
Dog owner	36	8	31	13
With dog	16	6	16	6
Without dog	20	2	15	7
Non-owner	13	9	16	6

Table 2

Main Differences Between Experimental Groups

	Beck Depression Inventory - II	
Group	Mean	Standard Deviation
With dog	3.64	3.43
Without dog	5.95	5.385
Non-owner	6.95	6.214

	Pet Attitude Scale	
Group	Mean	Standard Deviation
With dog	42.45	7.645
Without dog	40.45	11.791
Non-owner	21.64	18.186

	Reworded Self-Esteem Scale (Prior to Mood Induction)	
Group	Mean	Standard Deviation
With dog	17.55	2.738
Without dog	15.86	3.342
Non-owner	14.50	5.280

Despondency (Prior to Mood Induction)

Group	Mean	Standard Deviation
With dog	4.32	4.031
Without dog	7.61	8.396
Non-owner	15.58	18.635

Apprehension (Prior to Mood Induction)

Group	Mean	Standard Deviation
With dog	10.02	16.650
Without dog	6.77	6.254
Non-owner	19.95	24.706

Change in Anxiety

Group	Mean	Standard Deviation
Dog owner	+1.93	15.132
Non-owner	-6.66	16.234

Change in Apprehension

Group	Mean	Standard Deviation
Dog owner	+2.92	13.130
Non-owner	-4.93	13.900