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A Confirmatory Factor Analysis of the Lexington Attachment to Pets Scale

Tracy Leigh Zaparanick
University of Tennessee - Knoxville

To the Graduate Council:

I am submitting herewith a dissertation written by Tracy Leigh Zaparanick entitled "A Confirmatory Factor Analysis of the Lexington Attachment to Pets Scale." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Social Work.

William R. Nugent, Major Professor

We have read this dissertation and recommend its acceptance:

John C. New, Neil Greenberg, John E. Nolt

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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A CONFIRMATORY FACTOR ANALYSIS OF THE
LEXINGTON ATTACHMENT TO PETS SCALE

A Dissertation Presented for the Doctor of Philosophy Degree
The University of Tennessee, Knoxville

Tracy Leigh Zaparanick
May 2008

DEDICATION

Firstly, this work is dedicated to my son, Jason. I am grateful you are in my life, your presence has given me a perspective that I otherwise would not have known.

Secondly, I dedicate this work to those canines who have been present in my life, in the order of their appearance: Buffy, Sam, Tuffy, Whiskers, Brandy, Ripley, Rachet, and Bailey. Your unfailing companionship and unconditional love planted a seed that has since germinated into a way of life that values and respects interspecies relationships. I hope this work reflects the adoration I have for those who have gone over the rainbow bridge in the hereafter and those still here today.

A special note about my current canine companion, Bailey. If Bailey experiences anything near the human emotion of betrayal, the countless hours I have spent at the computer have given her cause. Her incredible patience and urgencies to walk away for awhile have helped this process and approach.

ACKNOWLEDGMENTS

ABSTRACT

The purpose of this study was to investigate the extent to which the word "pet" provided valid results in the Lexington Attachment to Pets Scale (LAPS) (Johnson, Garrity, & Stallones, 1992). A multiple-groups confirmatory factor analysis, using maximum likelihood (ML) estimation, was conducted to test the hypothesized factor structures in the specified measurement model. Respondents to the Original version (i.e. used the word pet) and the Personalized version (i.e. embedded the canine's name as typed by participants) made up the two groups. Features of an electronic survey were necessary for this personalization and systematic alternative assignment to the two LAPS versions. A snowball sampling method utilized electronic mail to invite self-selected participants meeting the following criteria: 18 years or older; lived in the United States; and at least one dog living inside/outside their home and for whom they are responsible at least some of the time.

According to collected human and canine demographics, the Original ($n = 1,854$) and Personalized ($n = 1849$) groups appeared to be statistically equivalent ($N = 3,703$). The hypothesized measurement model generated a χ^2 value of 4130.242, with 264 degrees of freedom and a probability of less than .001 ($p < .001$), suggestive of a lack of fit. However, goodness-of-fit indices were a consideration. Comparing the CFI (.95 vs. .862), TLI (.95 vs. .840) and RMSEA (<.05 vs. .063) cut off values with the results from this study respectively, reveals again, an inadequate fit. These results imply that the hypothesized measurement model was not consistent with the data and precluded specific tests of differential validity.

While the results of this study made it inadvisable to further examine the differential validity associated with linguistic differences in the scale items, critical information was nonetheless identified. According to the data in the current study, the LAPS conceptualization of "pet attachment" (*sic)* may not be valid. Until further research provides stronger evidence, use of this scale could produce results that lead to invalid inferences. The original LAPS conceptualization and quantification of human and canine relationships is still a work in progress. Moreover, psychometric work is critically necessary before using the LAPS.

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CHAPTER 1

INTRODUCTION

The delusion is extraordinary by which we thus exalt language
above nature: - making language the expositor of nature, instead
of making nature the expositor of language.
(Johnson, 1947, as cited in Beach, 1955, p. 401)

The oldest known human interspecies companion is the canine (Serpell, 1995).

Human-canine relationships were acknowledged by our primeval species, *H. sapiens*

through drawings, like one found in a tomb painting at Beni-Hassan dated approximately

2100 B.C. (Smith, 2004). Several theories exist about the ancestry and acculturation

process for the domesticated dog (Smith, 2004). Regardless of how this kinship evolved,

human characterizations of they relate to other species range from consecrated to

desecrated. An increasing number of scholarly efforts seek to explore and understand the

manifestations of these extreme, moderated, and blended relations.

Statement of the Problem

The current language within the anthrozoological field reflects primordial,

semantical and prejudicial dilemmas. The accuracy of research investigations depends

upon effective communication. When the word used to refer to a member of another

species in an instrument has multiple meanings and/or potentially laced with biases, how

valid are the responses?

Anthrozoology blends two fields of study. The prefix "anthro" means "of man,

pertaining to man" (Oxford English Dictionary [OED], 1989), while *zoology* refers to a

branch of "science which treats of animals" (OED, 1989). This emerging specialty field

by nature is interdisciplinary (Kellert & Berry, 1985; Zeglen, Lee, & Brudvik, 1984).

1

In 1981, the Pet Attitude Scale (Templer, Salter, Dickey, Baldwin, & Velever, 1981) was published and has since been referred to as one of first systematic attempts to capture the favorableness of attitudes humans had for a member of another species (Lago, Kafer, Delaney, & Connell, 1988; Poresky, Hendrix, Mosier, & Samuelson, 1987; Wilson, Netting & New, 1987). Since then 89 original, published empirically derived instruments purport to measure some dimension of the relationship or interaction between humans and a member of another species.

Problems cited by a multidisciplinary team of scientists at the "Delta Society Invitational Conference for Research on the Interactions of Animals and People" over twenty years ago persist (Zeglen et al., 1984). The stated goal for those attending was to "determine the research questions that need to be studied in the human-animal bond and the best strategies for addressing them" (Zeglen et al., 1984, p. 6). The following areas represented the broad topics for discussion: theoretical directions, methodological and research recommendations. Since then, theoretical publications have addressed the quality and kind of interactions humans have with a member of another species (Brown, 2004; Collis & McNicholas, 1998; Kidd & Kidd, 1987; Scott, 1992; Staats, Pierfelice, Kim, & Crandell, 1999). Attempts have been made to improve upon methodological strategies (Johnson, Garrity, & Stallones, 1992) and the research recommendations, by furnishing cross-cultural studies (Brown, 2003; Lago et al., 1988), and specific interspecies relationships (Dwyer, Bennett, & Coleman, 2006), but they are the exception rather than the rule.

Even the definitive factors that account for enduring and deeply personal relationships between humans and dogs continue to remain elusive. Efforts to

disentangle interspecies relationships are complicated by their intricate, multi-layered, and intertwined nature (Andrews, 1992; Lago et al., 1988; Staats, Miller, Carnot, Rada, & Turnes, 1996; Stallones, Johnson, Garrity, & Marx, 1990). Often scholars take a reductionistic approach to describe the *human-animal bond*, whereby only the human's perspective, and only a limited version of that, is used to explain this bond (Zeglen et al., 1984). When the focus of research involves two or more species, an appreciative expertise in the individual species' communications, physiology, psychology, ethology, and social structure are necessary. Only when interspecies elements such as these are purposefully integrated, can a comprehensive research approach begin to explain how this diverse, dense, and bi-directional relationship functions.

The previously cited invitational conference also questioned the terminology largely around the use of "bond" versus "relationship" or "interaction" (Zelgen et al., 1984). However, this author suspects that the use and misuse of language plays a much greater role, as an obstacle, in this field and is the premise of this dissertation project. The anthrozoological vocabulary is questioned, challenged, and is investigated. Word selection in much of the scholarly writing reads much like the popular media. Perhaps the lack of a sophisticated dictionary in this field simply reflects inadequacies or the vacant elements, as mentioned above. Kemmerer (2006) astutely observes that the English language suspiciously lacks a word that *only* refers to an animal who is not a human being, despite the long and interdependent history humans have with other species. Conceivably this English language deficiency continues because conceptualizations are stifled in convention and/or bias and of course, this would have implications for the subsequent interpretations. To fill this lexical gap, Kemmerer (2006)

has offered the simple word "anymal" to refer to "any animal who does not happen to be the species that I am" (p. 10). Time, usage and discourses concerning this neologism will determine its adoption.

Words and phrases used in the anthrozoological literature that refer to a member of another species, typically in the context of some interspecies relationship, include "pet," "companion animal," "nonhuman animal," "other species," "other animals," and "animal companion." Problems associated with such terms include moral dilemmas, discriminatory connotations, and polysemy attributes. For example, the propensity for problems exists when using the word or phrase *nonhuman* or *nonhuman animal*, since it implies that the golden standard is human. The function of research is to reach beyond seeing things as we are and instead, see things as they are. Should evidence support the speculation of an antiquated anthrozoological vocabulary, ramifications may exist for conceptual frameworks, methodological strategies, and even the results drawn from this language.

Investigators of social phenomena have a particular responsibility in communicating effectively, not only to maximize participant recruitment but also to ensure that qualitative and quantitative methods elicit valid responses. Effectively communicating a message or question requires the speaker to possess a repertoire of communication skills. Even for physicians, experience alone is not enough (Roter, Stewart, Putnam, Lipkin, Stiles, & Inui, 1997). This repertoire includes judicious use of nonverbal communication (e.g., physical gestures, facial expressions, proximity, and tone of voice) and verbal communication (e.g., evidence of listening, cultural and psychosocial sensitivities, delivery pace and a discriminating approach in word

selections). The vocabulary used by a physician speaking to colleagues will likely change when the listener is a patient. The distinctions between the two vocabularies allow for more or less exactness in the message, mediating the difference between comprehension and incomprehension. Normally the terminology within a field of study expands to enhance precision, whereas communications outside that field usually become more generic or, less technical to facilitate meaningful, albeit general, exchanges.

The Pet Attitude Scale (Templer et al., 1981) and the majority of related ones that followed lacked even a conceptual definition of the investigated construct (e.g., pet attachment) prior to data collection. Instead, if the authors presented a definition, it almost habitually came from the emerging themes identified in the exploratory factor analysis, referred to later as its subscales. Formulating a definition after data collection prohibits the testing of a theoretical definition or conceptualization. These subscales may very well represent the attenuated and obvious shades of a broad "pet attachment" construct. However, creating such definitions *post hoc*, based on the results of one sample's data, greatly compromises the definitional integrity of the study's construct.

Of the eight selected pet attachment scales critiqued in this paper, all but one uses the word "pet" to refer to a member of another species in their scale. The word *pet* is polysemic, possessing multiple definitions, both in the noun and verb form. The noun form is the focus for discourse here. *A New English Dictionary on Historical Principles* contains the following entry for *pet* (Murray, 1909, p. 745). The etymology for pet is only identified for the first entry; its origin is Northern English (Scottish). The *Oxford English Dictionary* (1989) reflects similar entries.

1   a.   (dated 1539) Any animal that is domesticated or tamed and kept as

a favourite, or treated with indulgence and fondness; esp. applied

to 'a lamb' (or kid) 'taken into the house, and brought up by hand,

a cade lamb'

     b.   (dated 1842) Applied to a plant artificially reared

2   a.   (dated 1508) An indulged (and, usually, spoiled child)

     b.   (dated 1755) Any person who is indulged, fondled, or treated with

special kindness or favour; a darling, favourite

3   a.   (dated 1584) Kept as a pet or favourite: orig. applied to a lamb

brought up by hand

     b.   (dated 1832) Of a person, or more usually *transf.* of a thing

(material or immaterial)

     c.   (dated 1829) A name expressing fondness or familiarity, as the

various abbreviated and altered forms, diminutives, etc., of

Christian names; a hypocoristic name

The second entry for *pet* dates this definition back to 1590; "Offence at being (or

feeling) slighted or not made enough of; a fit of ill humour or peevishness from this

cause: now usually implying one of a slight or childish kind" (Murray, 1909, p. 745).

The third and final noun entry for pet, is dated as early as 1515. The meaning for this

entry was "a breaking wind; fart" (Murray, 1909, p. 745). *The Oxford Dictionary of*

Current English defines pet as a, "domestic or tamed animal kept for pleasure or

companionship" (Thompson, 1998, p. 667).

Given the numerous variety of historical and contemporary definitions for pet in our society, it looses it specificity. In order for any scale to produce valid results, specificity is required. Furthermore, explicit language (i.e., shared terminology and definitions, impartially written and grammatically correct questions) increases the likelihood of appropriate inferences from scores. In the case of quantitative measures, valid responses are contingent on the interpretation of the written communication. Moreover, the word or phrase chosen to refer to a member of another species (i.e., canine in this case) is critical. This word(s) or phrase used in pet attachment (*sic*) scales is almost exclusively *pet*. Herein lies the question. Does *pet* accurately communicate to the respondent in such a way to elicit a valid attachment response? Or, do respondents think differently about the word *pet*? Does it present a moral dilemma and/or possess discriminatory connotations for the respondents? Not attending to these concerns could very well constitute measurement bias in the scale.

CHAPTER 2

HUMAN-CANINE RELATIONSHIPS

"What is man without the beasts?" asked Chief Seattle. "If all the
beasts were gone, men would die from a great loneliness of spirit."
How will human beings be affected if animals vanish from our
world? Without our four-legged and winged brothers and sisters
to share our lives, will we lose part of our souls? "Whatever
happens to the beasts soon happens to man," said Chief Seattle.
"All things are connected."
(Perry, 1972, as cited in Scull, 2000)[1]

Historical Perspective

The *Homo* genus emerged about 2.5 million years ago marked with a slower

growth rate, adaptive body shape, encephalization (i.e., larger brains proportion to the

body size), and a greater reliance on a flesh-eating diet (Colbert, Minkoff, & Morales,

2001; Lahr & Foley, 2004) than their primate ancestors. Anthropologically speaking,

Homo sapiens are a relatively young species to roam this earth. Anthropologists estimate

that our species, *H. sapiens*, made an appearance around 150,000 years ago (Jurmain,

Kilgore, & Trevathan, 2004; Lahr & Foley, 2004; Stringer, 2003). To gain an

evolutionary perspective, the oldest vertebrae fossil on record belong to the agnathans or

jawless, parasitic fishes who lived approximately 500 million years ago (Colbert et al.,

2001). The lamprey appears to be the oldest existing vertebrate belonging to this same

agnatha fish class and has remained unchanged since the Devonian period, about 360

million years ago (Colbert et al., 2001).

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[1] Screenwriter Ted Perry wrote this as a fictionalized speech given by the character Chief Seattle in the

movie, *Home*. Absence of credit to Perry in the movie has fueled the erroneous belief that Chief Seattle

spoke these words in his 1854 speech.

Ancient remains of the *Canis familiaris*, domesticated dog, found in Oberkassel, Germany date back approximately 14,000 years ago (Nobis, 1979, as cited in Serpell, 1995). These canines are thought to be the first species to be domesticated and thus the oldest known interspecies companion for the human population (Scott, 1992; Serpell, 1995). An early-domesticated dog fossil found in North America was unearthed in Danger Cave, Utah (Grayson, 1988). These remains date around 9,000 to 10,000 years old. Another popular species for human companionship is the domestic cat. The oldest fossils of a tabby species, *Felis silvestris*, were found in an ancient city of Shillourokambos in Cyprus that dated back approximately 9,500 years ago (Muir, 2004). The skeletal remains of this wildcat, believed to be the ancestor to the domesticated cat, were unearthed and preserved exactly as the accompanying human remains, suggestive of a personal relationship.

Domestication of the dog occurred when human subsistence relied on hunting, gathering, and foraging, according to the archeological evidence (Serpell, 1995). Authors define *domestication* differently and typically, their conceptualization reflects the perspective of their professional discipline. Clutton-Brock (1999) suggests that the biological process of domestication "begins when a small number of animals are separated from the wild species and become habituated to humans" (p. 30). Alternatively, from a cultural standpoint "domestication begins with ownership...domesticated animals have to be incorporated into the social structure of a human community and become objects of ownership, inheritance, purchase, and exchange" (Clutton-Brock, 1999, p. 31). O'Connor (1997) reviews several definitions of domestication and observes that the domesticated species themselves are "more or less

passive in the establishment of domestication" (p. 150). Any species forbidden to exercise independence, due to constraints enforced by another species, inherently becomes vulnerable and dependent upon the dominant species.

Debates about the origin of *Canis familiaris* have produced a flurry of controversy similar to those about human origins. Most theorists speculate that dogs are descendants of wolves (Colbert et al., 2001; Musil, 1998; Serpell, 1995; Vila, Savolainen, Maldonado, Amorim, Rice, Honeycutt, et al., 1997) while others offer behavioral, morphological and molecular evidence to argue they derive from another wild canine blood line, wild *C. familiaris* (Koler-Matznick, 2002). Aside from the origins, the basic social structures of the *Homo sapiens* and *Canis familiaris* communities are similar enough to make companionship natural (Colbert et al, 2001; Koler-Matznick, 2002, Serpell, 1983). Humans took advantage of the canine's hunting skill by adding them to their own hunting arsenal and a partnership was born (Koler-Matznick, 2002). One highly prized canine skill was their ability to track the scent of another animal nearby or an injured one with their highly sensitive noses, which increased the likelihood of a meal (Serpell, 1995; Wendt, 1996). For centuries and across continents, canines have repeatedly demonstrated their competency in tracking (Derr, 2004).

Searching the human-canine related literature, stories emerge of how canines were at the heart of community activities and a number of historical events (Coren, 2002; Derr, 2004; Henninger-Voss, 2002; Wendt, 1996). Ancient Egyptians worshiped dogs (Wendt, 1996). In ancient Egyptian society as well as countless others, dogs guarded the children, pulled carts, herded and protected domestic stock. (Coren, 2002; Derr, 2004; Wendt, 1996). Parallels are drawn between the lives of European women and dogs since

both populations worked incessantly on menial tasks and were often mistreated, although, the dogs were likely to receive more abuse and less food (Derr, 2004).

It was on the shores of what is now Puerto Bueno, Jamaica, that Christopher Columbus ordered his first military exploitation of a canine when he used a dog to strike fear and terror in the natives (Coren, 2002; Derr, 2004). Capitalizing on this military tactic, Columbus would eventually consider one dog to equal fifty men in combat (Coren, 2002).

Beginning around the 1820's a "domestic ethic of kindness" began to transform the obligations of the Victorian American middle-class (Grier, 2002, p. 316). This ethic redefined American family relationships with other species in and around their homes. If exposed to the company of other species, children were thought to develop a conscience and would abstain from causing pain to a member of another species (Grier, 1999). This new code of conduct set forth behavioral expectations that were in direct contradiction of the customary abusive practices toward these species.

Around the same time, the first British animal welfare act passed in 1822 (Coren, 2002). Two years later, the Society for the Prevention of Cruelty to Animals (SPCA) was established. This advocacy organization liberated "cart dogs" and "draft dogs" who were often undernourished, unattended and abused from having to pull heavy carts on the cobble stone streets of London (Coren, 2002). This unprecedented law protected canines within the city, before any child labor law existed. Florence Nightingale, considered the founder of modern nursing, believed her divine instruction to devote her life to assist in the healing of others came right after an encounter and subsequent tending of a farmer's dog named Cap (Coren, 2002).

In 1874, the parallels between domesticated dogs and human children were inextricably demonstrated when the American SPCA intervened on behalf of Mary Ellen, a severely abused and neglected child. After the local police department informed Mrs. Wheeler, a New York City social worker, that they were unable to intervene because no "proof of assault" evidence existed, she then appealed to the local ASPCA. Through strategic planning and enlisting the help of neighbors, a case was prepared against Mary Ellen's foster mother. Mary Connolly was convicted of child abuse and jailed for one year based on the evidence supplied through witnesses and the presence of a tiny, bruised, and sickly nine-year old. Henry Bergh, founder of the ASPCA and prosecuting attorney, used analogical reasoning that since other species were protected because of their "absolute helplessness in the face of human cruelty" (Coren, 2002, p. 176) children should be too. This case was the impetus to create an organization that protected children like the ASPCA protected other species. The American Humane Association is one such example that even today efforts contributing to child welfare and the welfare of other species are under the umbrella of one organization (American Humane, n.d.).

People who live with at least one member of another species, especially with those who are not far from us in evolutionary terms, will swear that these interspecies family members enjoy and are plagued with the same human emotional depth of joy, pain, love, sadness, satisfaction, and fear. Then there are the skeptics, and converted skeptics. Countless anecdotal stories live through testimonials, storytelling and/or documentation about how human minds change.

The following excerpt illustrates an account where the perception of a dog shifts from having preconceived canine traits to possessing human-like qualities. Interestingly,

the author was known to be long admirer of dogs but through a treacherous excursion, he

realizes the similarities between man and dog. "Stickeen," was a small, unkempt,

persistent hairy dog finding adventure and in the moment recounted here, much danger in

the southeastern frozen Alaska region.

> His looks and tones of voice when he began to complain and speak his
> fears were so human that I unconsciously talked to him in sympathy as I
> would to a frightened boy, and in trying to calm his fears perhaps in
> some measure moderated my own. "Hush your fears, my boy," I said,
> "we will get across safe, though it is not going to be easy..." (Muir,
> 1909, p. 57)

Current Perspective

The industrial revolution brought considerable changes to the standards of living

to much of North America. With the introduction of steam and electricity as a power

source for the newly created machinery, the demand for human and other animal muscle

decreased. Farming became more efficient through the use of machinery, as seen in

combining an acre of wheat in less than 4 hours, compared to the previous 61 hours of

labor it required (Zinn, 1999). The increasing availability of factory work resulted in

people migrating from the rural areas of America to the urban setting. When the 12 to 14

hour workday decreased, it left more time for leisure activities (Kidd & Kidd, 1987).

This urbanization and industrialization now offers many lifestyle conveniences

that were unheard of just one hundred years ago (e.g., fast food restaurants). While

modern conveniences have eased the burden of obtaining some of life's necessities, other

stressors have emerged. For instance, staying current with new technologies and prolific

amounts of available information can be exhausting. Changes have also occurred within

the family, community and social systems. The impact of geographic mobility has

changed the family profile. Where families were once likely to take on the responsibility

of caretaking for the elders within their family, now long-term-care facilities increasingly assume this role.

Perceptual changes towards other species have also resulted from this urbanization and industrialization (Jasper & Nelkin, 1992). As geographic distances expand and perhaps even emotional distances between families and friends widen, so has an individual's ability to provide or find companionship and support. These changes have ushered in, and some would argue encouraged through necessity, substitutes within the familial unit. Dogs are now considered sources of sentimental value rather than the instruments of labor and production they once were (Jasper & Nelkin 1992).

Today, canines continue the pastime of hunting alongside their humans, but rarely do so out of necessity in developed countries. The working dog's occupation list has certainly expanded from those of yesteryear. Many canines are indispensable in search and rescue work, customs services, law and drug enforcement (Weisbord & Kachanoff, 2000). They also provide an invaluable service to those who need assistance because of hearing, sight and muscular-skeletal impairments and in epileptic seizure-alerts (Coppinger & Coppinger, 2001). However, this is not a dogs' life entirely. Some canines compete as humans do in a variety of sporting and pageantry events. Even the awards in these competitions resemble those presented in human contests, though it is questionable whether the prestige and financial remuneration have the same meaning for the dogs. Dogs who engage in these events and the above activities give their human companions an opportunity to serve their communities, lead a more independent life, and the joys associated with competing and status.

Breeding represents another contrasting example of how dogs have been further

integrated into the fabric of our society. The public now breeds numerous variations of

the domesticated dog, whereas in the past only nobility and the wealthy had the prestige

and means to invest in such an undertaking. The American Kennel Club, Inc. (AKC)

reports that as of November 1, 2004, there were 153 distinct breeds recognized in the

U.S. who were eligible to compete in their AKC competitions (American Kennel Club

[AKC], n.d.). The inclusive, elite all-breed registry, United Canine Association,

recognizes over 400 breeds (United Canine Association, n.d.).

These cumulative changes seem to have fulfilled Levinson's *Forecast for the*

Year 2000, or at least with man embracing members of other species:

> Suffering from even greater feelings of alienation than those which
> are already attacking our emotional health, future man will be
> compelled to turn to nature and the animal world to recapture some
> sense of unity with a world that otherwise will seem chaotic and
> meaningless. Animals will become junior partners and friends,
> effecting a revolutionary transformation of man's attitudes
> (Levinson, 1975, p. 155-156).

Prevalence of Human-Canine Relationships

The AVMA reported that 58.3% of U.S. households lived with at least a member

of another species sometime during 2001 (AVMA, 2002). However, regardless of a

cohabitating dog or cat, their allergens specifically are universally present in U.S. homes

(Arbes, Cohn, Yin, Muilenberg, Friedman, & Zeldin, 2004). The American Veterinary

Medical Association (AVMA) has generated the *U.S. Pet Ownership & Demographics*

Sourcebook report three times in the last 14 years (American Veterinary Medical

Association [AVMA], 1992, 1997, 2002). This document fulfills a significant empirical

void, and serves as a rare source of important census information. This report offers a

multi-dimensional demographic profile of U.S. human households in which members of other species live. But like much of the literature written about the relationships humans have with other species, its choices of words used to identify, describe, and investigate are laced with value judgments and discriminatory nuances.

The *U.S. Pet Ownership & Demographics Sourcebook* report indirectly defines pets (i.e., dogs, cats, birds, horses, fish, ferrets, and rabbits) as a member of another species owned by a household; ownership being the operative word here. All household respondents, regardless of which species member they were referencing, were posed the question, "I consider my pet(s) to be a:" and were directed to choose one of the three following response choices: 1) Family member, 2) Pet/companion, or 3) Property under your care. Interestingly, only 2.2% of all respondents considered pets "Property" under their care (AVMA, 2002, p. 7). Even fewer households with dogs (1.5%), considered them "property" (AVMA, 2002, p.12).

The sample used to report that 58.3% of them lived with at least a member of another species sometime during 2001 was said to be representative of all U.S. households (AVMA, 2002). Within each of the nine U.S. Census divisions, consideration was given to market size, age of household head, household size, and income (AVMA, 2002). Out of the 80,000 randomly selected households, 54,240 questionnaires were used in the analysis, yielding a 67.8% response rate. Likewise, in the 1996 study, which sent out a similar questionnaire and used a similar strategy, an estimated 58.9% of households lived with a member of another species (AVMA, 1997). Overall in 2001, 46.9% of household representatives viewed a member of another species as "family members," 50.9% as "pet/companion," and 2.2% considered them "property"

(AVMA, 2002). These percentages varied along age groups too. For instance, the greatest distinctive differences were found in the 19-29 age group (young adult) and the > 65 age group (elder). The young adult versus the elder age group completed the following sentence respectively, "I consider my pet(s) to be a:" family member (51.1% versus 37.5%), pet/companion (47.1% versus 58.3%), or property (1.8% versus 4.3%) (AVMA, 2002, p. 7).

In 1991, the AVMA estimated that 36.5% of all U.S. households had at least one dog in their household (AVMA, 2002). This statistic reportedly dropped to 31.6% in 1996 but then increased in 2001 to 36.1% (AVMA, 2002). Of those 2001 households who had dogs, 51% considered them family members.   In the same year, females were the primary caretakers of these dogs in 72.6% of the participating households. Of those 36.1% households who lived with dogs in 2001, 64.9% of them had only one canine present, while 23.1% had two dogs, 6.5% had three, and 5.5% had four or more who were considered "owned" by the household. According to this same document, participants reportedly doubled their expenditures for veterinary medical services on their dogs, when comparing these expenses in 1991 (4.9 billion) to the year 2001 (11.6 billion).

Incidentally, the American Pet Products Manufactures Association, Inc. (APPMA) announced that 2006 expenditures such as food ($15.4 billion), veterinary care ($9.2 billion), supplies/medicines ($9.3 billion), live purchases of other species ($1.9 billion), and grooming & boarding ($2.7 billion) totaled $38.5 billion (American Pet Products Manufactures Association [APPMA], 2006). Projected revenues for 2007, considering inflation, are $40.8 billion. This business enterprise has more than doubled in the last decade, considering the $17 billion total reported in 1994.

The AVMA report organized its data by three family configurations (i.e., single, couple, parents), and then expanded each of these categories to further demarcate three life-stages (i.e., young, middle, and older) (AVMA, 2002, p. 51). Within each of these three configurations, dogs lived in: 1) 20.8% of young, middle, and older single households; 2) 48% of young, middle, and older parent households; and 3) 45% of young, working older, retired older couple households. Similarly, breaking down households by the number of humans present and evaluating what percentage live with dogs revealed that: 20.8% are one-member, 34.3% are two-member, 46.2% are three-member, 50.6% are four-member, and 53% are five or more member households. As income and education level decreased, so were the chances that household members lived with a dog. Another demographic that negatively affected the likelihood of a cohabitating canine was the size of a community.   As the community population increased, co-existing with a canine conversely declined. The likely 2001 demographic profile of a U.S. household who lived with a canine had five or more human members, comprised of college graduate parents with adolescent children. The income of this homeowning household fell between $55,000 - $84,999 and lived in a community of less than 100,000 (AVMA, 2002).

The American Animal Hospital Association (AAHA) collects data annually for their *Pet Owner Survey*. As in the past 13 years, AAHA sent out 10 surveys to 700 of their randomly selected AHAA accredited veterinary practices in 2004 (D. Tracy, Public Relations Coordinator for AHAA, personal communication, April 15, 2005). These practices were directed to randomly distribute the surveys to their clients and collect them ($N = 1,238$). Of special note here, 94% responded affirmatively to this question, "Does

your pet have human-like personality traits?" (American Animal Hospital Association

[AAHA], n.d., p. 1) Also, when asked how likely they were to "risk your own life for

your pet?" 56% responded "very likely." (AAHA, n.d., p. 1).

<p style="text-align:center">Correlates of Human-Canine Relationships</p>

Typical canine social behaviors do not usually cause them to avoid humans

because of discriminatory reasons, unlike typical human social behavior. Dogs will keep

company with the young, the old, the wealthy, the poor, those who are black, or those

who are white. Most dogs do not discriminate between those who have full access to all

human capacities, or those who are severely limited. Many dogs happily share

companionship with their own species, as well as the human species, and will make

accommodations for other species in their lives, too. In short, dogs are the companions

many humans wish they could be or have, thus making them highly desirable.

Observations surrounding the medicinal benefits of human-canine relationships

have primarily been anthropocentric. That is, humans have primarily invested in

gathering data on how people benefit from dogs (Wilson & Netting, 1983). Species that

cohabitate with humans have been known to detect "low mood of illness, the need for

play, and distraction from our woes" (Becker, 2002, p. 98). These species have not only

been companions to people over time, but they have also served as therapeutic

instruments to raise the spirits of the curable and incurably ill (Soave, 2000). The

AVMA prevalence statistics previously reviewed indicate that nearly 6 of 10 households

reported cohabitation with a member of another species and of those six households,

slightly more than 2 reported living with a dog. So what are the costs and benefits of

these relationships for the human and the canine? Arguably, these costs and benefits are

<p style="text-align:center">19</p>

most clearly found at the intersection of proximate and ultimate needs of the human and other species when one considers the ethical treatment of dogs by humans (Greenberg, 1992, 1995).

Human Benefits

Hart (1995) identifies different ways dogs endear themselves with humans. Canines are a motivation for exercise, facilitator of human contact, reason to nurture, provider of social support and an active, stimulating companion.

Qualitative interviews of 25 Cambridge, England residents revealed 22 themes that they considered as important dog attributes (Serpell, 1983). These qualities were: playfulness, attachment, excitability, territorial barking, attitude to walks, intelligence or aptitude, protectiveness, possessiveness, loyalty/affection, sensitivity to the human's mood, attentiveness, reaction to human's homecoming, attitude to food, sense of humor, expressiveness, obedience on walks and at home, friendliness to strangers and other dogs, and reaction to separation both during the day and at night. Themes of physical, intellectual, and emotional exchanges emerge from this list. These desirable characteristics also gave the human a consistent opportunity to interact in a pleasurable and/or affirming manner.

One of the first and most often-cited documented efforts to integrate a member of another species in the psychotherapy session came from psychologist, Dr. Boris Levinson (Levinson, 1962). Unexpectedly, a mother and her distressed son arrived early for an appointment and Jingles, Dr. Levinson's dog, was in his office. After allowing Jingles to stay, he observed the advantages of having Jingles present during the session. After multiple sessions and the successful discharge of this young child, Dr. Levinson launched

his career in what would later be called "animal-assisted therapy" (AAT). Dr. Levinson not only strategically integrated a member of another species into his sessions; he also promoted this AAT intervention (Bustad & Hines, 1988).

Many have since employed a member of another species with the utilitarian task as a therapeutic intervention. Wilson & Netting (1983) challenge researchers to accumulate a body of evidence that will provide an array of evidence-based interventions. Success has been reported with a member of another species being integrated as visitors or live-ins in cancer units (Johnson, Meadows, Haubner, & Sevedge, 2003), long-term care facilities to reduce loneliness (Banks & Banks, 2002), tension, confusion, and depression (Crowley-Robinson, Fenwick, & Blackshaw, 1996), and in psychiatric hospitals to reduce the anxiety in people with a variety of psychiatric disorders (Barker & Dawson, 1998).

Canines have been the primary species to train as specialized assistants for the physically handicapped (Bustad & Hines, 1988; Franklin, 1999; Soave, 2000) and the applications of these trainings are broadening. Just as dogs sniff out illegal drugs and lethal weapons in airports, they now communicate with researchers when particular odors are present in urine. Canines are now being considered diagnosticians for humans with bladder cancer based on urine odor (Willis, Church, Guest, Cook, McCarthy, Bransbury et al., 2004).

A seminal study conducted by Friedmann, Katcher, Lynch, & Thomas, (1980) examined one-year survival rates of severe angina pectoris (i.e., chest pain) or myocardial infarction (i.e., heart attack) discharged patients from a coronary unit. The survival rates for these patients were found to be higher (95%) in patients who had a member of another

species in their home when compared to those patients without another cohabitating species (74%). Later, Friedman & Thomas (1995) confirmed similar results. Another study examined human elders' physiological reactions while they watched an aquarium full of fish. The results indicated that it decreased the pulse rate and muscle tension, while increasing the skin temperature of the experimental group of elders (DeSchriver & Ridick, 1990).

For centuries dogs have been used for symbolic purposes (Serpell, 1996) and social status, especially when those dogs were the largest, fastest, and strongest. As companions, these species have had buffering effects by reducing the fear associated with medical procedures that are perceived as negative (Barker, Pandurangi, & Best, 2003), and the number of physician visits over a year (Siegel, 1990). They have also reduced the experience of posttraumatic stress reactions (Arambasic, Kerestes, Kuterovac-Jagodic, & Vizek-Vidovic, 2000) and the stressful impact of AIDS in some HIV-infected persons (Siegel, Angulo, Detels, Wesch, & Mullen, 1999).

Another advantage of interspecies relationships for humans is that it allows an obvious, natural, and culturally acceptable way of engaging others in public. Having the company of a member of another species invites an otherwise unknown person to approach and interact (Beck & Katcher, 1983). In fact, it is for this reason interspecies companions are referred to as "social lubricants" (Messent, 1983).

In comparison to humans who do not cohabitate with a member of another species, humans in interspecies relationships tend to have lower blood pressure (Anderson, Reid, & Jennings, 1992; Friedmann, Locker, & Lockwood, 1993), and lower triglyceride and cholesterol levels (Anderson et al., 1992). In addition, if these humans

have borderline hypertension and they take their dog to work, typically their blood pressure will be lower on those days (Allen, Shykoff, & Izzo, 2001). Women often view their human friends as judgmental, unlike their dog friends (Allen, Blascovich, Tamaka, & Kelsey, 1991). The delineation of perceived judgment between human companions and a dog companion correlated with their blood pressure readings; thus as perceived judgment of friends increased blood pressure, the dogs countered that effect.

Some have suggested that interspecies companions not only compliment and bring a unique dimension to the human experience, but they can also be human companion substitutes (Beck & Katcher, 1983). In a later edition, composed of literature that had since examined the health benefits of interspecies relationships, Beck & Katcher (1996) insisted that intraspecies-only relationships hindered the full potential of human health. Speculating on how a member of another species fit into the family as perceived by those who live with them, Cohen (2002) reports, "Pets seem to occupy an overlapping but different space from humans in a family" (p. 633). Examining the "psychological kinship" (p. 624) humans have with members of other species, Cohen suggests that humans recognize the literal difference between the two species, however despite this distinction, family member benefits are extended to the members of other species.

Human Costs

While the literature anticipates rewards for humans who maintain interspecies relationships, this is not always the case. Not all people are drawn to other species (Kidd & Kidd, 1987; Lawrence, 1987). Impartial, unintentional, and adverse effects also exist in human-canine relationships.

Rynearson (1978) is often cited when detrimental effects of interspecies relationships are raised. This psychiatrist argued that the "attachment relationship is pathological because of its defensive purpose, and its interruption can create enduring psychiatric reactions" (Rynearson, 1978, p. 550).

When humans attend to the needs of their cohabitating canine, humans have to make deliberate accommodations for their canine when they spend extended time away from home. In order to meet the needs of the canine, this will invariably require adjustments or restrictions for day long or extended travel activities.

The Cincinnati Veterans Affairs Medical Center conducted an exploratory investigation of the death of a member of another species, trauma, and activity among veterans (Baker, Boat, Grinvalsky, & Geracioti, 1998). In this study of 248 military veterans, over 80% had lived with a member of another species both as a child and as an adult. Proportionally more of the female veterans (77%) "lost an animal" they cared about when compared the males (67%). Respondents indicated (18.4% of females and 27.3% of male) witnessing the deliberate torture or harm inflicted on a member of another species. This same study also revealed that over half of the females (53%) and males (64%) have had at least one lifetime experience of being "really frightened" by another species. With regard to bestiality, among the women admitting to this sexual interaction a large percentage were forced, unlike their male counterparts who were more likely to initiate it on their own.

Other research indicates neutral results where the presence of interspecies companions did not serve as a prophylactic against headache or chronic pain (Hirsch &

Whitman, 1994), or significantly alter systolic blood pressure, diastolic blood pressure, heart rate, and mean arterial pressure (Moody, Fenwick, & Blackshaw, 1996).

When relationships exist between humans and other species, whether it is through companionship or as a food source, the transmission of an opportunistic infectious disease between humans and other species may occur. "Zoonoses" refers to this category of diseases (Glickman, 1992; Swabe, 1999). According to a zoonoses report endorsed by the Centers for Disease Control and Prevention (CDC), the last decade has seen infectious disease outbreaks from species (other than dogs) to humans in public settings from Escherichia coli 0157:H7, Salmonella, Coxiella burnetti, Mycobacterium tuberculosis, and ringworm (National Association of State Public Heath Veterinarians, Inc., 2005).

Dog bites are another cause of morbidity and mortality. A 1994 report, the latest year the CDC published data on the number of nonfatal dog bites in the U.S., indicated that 4.7 million people were bitten (Centers for Disease Control and Prevention [CDC], 2003). It is estimated that 799,700 required medical care. In another report, data collected from 1979 through 1994, indicated 279 humans deaths were attributed to assaults by one or more canines (CDC, 1997).

Canine Benefits

As expected, little is known about the experience of the domesticated dog, *Canis familiari*s (Serpell, 1995). The exception to this has been to study their behavior problems, personality (Gosling, Kwan, & John, 2003), and reactions to the attentional states of humans (Call, Bräuer, Kaminski, & Tomasello, 2003). Additionally, canines have been studied in the context of biomedical, psychological, and neurophysiological

(Odendaal & Meintjes, 2003) research. Some research indicates that not all human contact is beneficial for a member of another species' health and well-being (McMillan, 1999). McMillan goes on to report that this impact of human contact depends on the other species genetics, previous quality and type of social experience with humans. Research indicates that in the laboratory setting, when humans stroke or pet a member of another species, that particular animal's clinical signs of pain often appear to diminish (McMillan, 1999).

When considering benefits for any species, one essential element is the ability for that species to sustain direct fitness - that is, maintain a high number of successful offspring to supply the population. The previously mentioned statistics on canine prevalence in U.S. households (AVMA, 2002) and the growing number of breeds represented in the AKC, would indicate success in this area. Even the millions who are euthanized annually could attest to the population size (Humane Society of the United States [HSUS], n.d.).

By the standards of most humans in our global community, some domesticated dogs enjoy a life of luxury as exhibited by specialty foods, toys for entertainment, a comfortable home environment and no utilitarian expectation. Nevertheless, this is more of an anomaly than the norm.

Canine Costs

Living conditions such as those described above pale in stark contrast when one considers the number of homeless dogs euthanized each year, through no fault of their own. By definition, domestication encourages the canine to be dependent upon the

human. When a human no longer meets the most basic of needs, the canine will either die (e.g., because s/he cannot escape the environment) or become feral (Mann, 1975).

The National Council on Pet Population Study & Policy conducted surveys each year from 1994 through 1997 (National Council on Pet Population Study & Policy, n.d.). In 1994, a list of 5,042 shelters, housing over 100 dogs, cats and/or other species were solicited for the number of species entering their shelter. Based on a 21% response rate ($N = 1,070$), these shelters indicated that 2,222,752 dogs entered their facilities. Moreover, these same shelters indicated that 58.4% of these dogs were euthanized. The Humane Society of the United States (HSUS) estimates that between 3-4 million dogs and cats are given a "good death" each year (HSUS, n.d.).

From a Darwinian perspective, the domesticated dog's ability to evolve through natural selection is replaced by selection pressure related to domesticated constraints. That is, dogs are bred according to manifested traits that are likely to be expressed in the next generation. This selection process is guided primarily by anthropocentric needs, such as having a desirable neotenic appearance (e.g., large eyes, small nose, round face) (Burghardt & Herzog, 1980; Lawrence, 1986) and/or activity (e.g., skill in hunting, herding, protecting, and extermination of pests).

Dogs considered "pure" breeds are especially vulnerable to human control and manipulation of the breeding process. This results in numerous health problems. Serpell (2003) identifies the English Bulldog as the "canine equivalent of a train wreck" (p. 93) because of its brachycephalic head, prognathous upcurved mandible, distorted ears, tail, and clumsy movements. Another example, German Shepherds, are 4.95 times more likely to have degenerative joint disease associated with hip dysplasia than the same aged

Golden Retrievers, Labrador Retrievers and Rottweiler breeds (Smith, Mayhew,

Kapatikin, McKelvie, Shofer, & Gregor, 2001).

A retrospective study examining the prevalence of cataracts in dogs ($N = 39,229$)

found that the cataract formation was the most common eye disease (Gelatt & MacKay,

2005) among patients presented to veterinary teaching hospitals in North America from

1964 – 2003. Furthermore, these authors revealed that 58 breeds had a higher prevalence

rate for this condition than did their hybrid/mix-breed peers.

CHAPTER 3

HUMAN-CANINE RELATIONSHIP SCALES

Science is our attempt to understand the reproducible and
predictable aspects of nature. (Rosen, 1991, p. 4)

When examining an area of interest, reviewing the historical evolution of

perceptions and knowledge in that area may be helpful in synthesizing present-day

scholarly wisdom. The division created between humans and other species has historical

roots in European philosophy and religion as exhibited by Descartes (Schweitzer & Joy,

1950). The French philosopher Descartes certainly left a lasting legacy on this

separation, as he regarded other species as machines, not worthy of human sympathy or

concern. As a Catholic, Descartes considered the Catholic Church as setting the standard

of social morals and lawful conduct. After brokering a deal with the Catholic Church,

Descartes was able to study the human body without interference from this religious

institution. He divided human existence into two domains – the human mind

(mental/spiritual) and the human body (physical) (McMillan & Rollin, 2001). Damasio

(1994) is one of a growing number of contemporary scientists providing evidence that

Descartes' constructs contained theoretical errors and were misleading. Marginalizing a

dog's life experience is particularly easy when dogs are appraised as lacking the capacity

to plan, possess insight, experience pain and emotion or even suffer (Coren, 2002;

Panksepp, 1998). The advantage in maintaining this stance also saves the believer from

cognitive dissonance, that is, no moral consequence or challenge in decisions or actions.

The Judeo-Christian religious doctrine has been a powerful influence. It has

persuaded the direction and conventional thought regarding science. Principles of human

superiority continue to mold belief systems, values, perceptions and the entitled separation from other animals (Lawrence, 1995).

Present day molecular evidence illustrates how similar humans are to other species. In fact, these data indicate that humans and chimpanzees are close relatives (Weissenbach, 2004). Human DNA is said to be 98.4% equivalent to chimpanzee DNA, making humans genetically closer to chimps than African elephants are to Indian elephants (Schoen, 2001). As the work of geneticists extends, perhaps it will have us consider Kowalski's (1991) view that "Animals not only have biologies; they also have biographies" (p. 107).

Dunayer (2001) points out, we use "separate lexicons" to distinguish and dismiss the experience of other species. Take for instance the term "corpse," which means a dead human, while "carcass" or "meat" refers to the dead body of a species other than human.

Attempts to apply human perceptions, experiences, and/or desires to other species are often considered anthropomorphizing (Mitchell, Thompson, & Miles, 1997). Anthropomorphism is "attribution of human mental states (thoughts, feelings, motivations and beliefs) to nonhuman animals" (Serpell, 2003). Serpell (2003) suggests that during the Paleolithic period, *Homo sapiens'* success in hunting reinforced the tendency to anthropomorphize. Exploiting the minds of prey and ultimately predicting their behavior was a product of transforming this anthropomorphic ability. Conversely, when prejudices were associated with anthropomorphism, this led to unjustified denial of the various aspects of interspecies consciousness.

Obviously, there are differences between the capacities of humans and other species. For example, a dog's keen sense of smell and hearing easily surpasses the same

human sensory abilities. Humans, on the other hand, use sight to compensate for what their noses and ears fail to report even though, some breed of dogs exceed a human's aptitude in visual perception. Recognizing the similarities and differences between two species, without a value judgment, lends itself to objective science. Otherwise, the human aptitude becomes easily and dangerously the benchmark by which all other animals are judged.

<div align="center">Rationale and Key Ingredients in Standardized Scales</div>

In 1984, the Delta Society, an educational non-profit organization targeting interspecies interactions, called upon the anthrozoological community to use comprehensive and meticulous research methods from a multidisciplinary perspective (Zeglen et al., 1984). This conference of experts also maintained that the creation of standardized scales was critical to the advancement of this growing field (Poresky, 1989). The literature reflects many efforts toward this goal.

Scientists investigating relationships and/or interactions among humans and members of another species know that a standardized measure for assessing a desired dimension is critically necessary (Lago et al., 1988; Poresky, 1989; Zasloff, 1996). Among other things, this standardization enhances communication and understanding. These exchanges are critical to advancing the knowledge in any field. Simultaneously, as theories and concepts are tested, other readers are better able to synthesize the reported results. Standardized measures help bring clarity to the language of interest. When language conformity exists in a field, publications become more meaningful. Without a doubt, conformity restricts the range of language usage, and empirically speaking that is an important feature. These restrictions offer clarity to the concepts of interest.

Using a standardized scale in a therapeutic setting to develop a client's treatment plan or as a way of assessing familial relationships, allows for greater objectivity than relying on the subjectivity of a clinician's judgment/bias. Likewise, this scale could serve similar purposes for social workers in management/community programs and who are unfamiliar with this type of significant relationship.

Nunnally (1978) reduces measurement to consisting of "...rules for assigning numbers to objects in such a way as to represent quantities of attributes" (p. 3). Scientific measurement exists when the language is defined in quantitative units (Kline, 2000). Furthermore, Kline (2000) conceptually explains, once the "attribute has quantitative structure then it is a mathematical theorem that magnitudes of a quantity stand in numerical relations, one to another" (p. 9). In other words, reducing observations into numerical values allows comparisons and contrasts. Advantages of standardized measures include objectivity, quantification, communication, economy, and scientific generalization (Nunnally, 1978). Objectivity eliminates subjectivity or even guesswork from the scientific observation. Assigning numerical values to measured concepts allows the opportunity for delineations among scores and the analysis of such values. Using a standardized scale allows more efficiency of time and money, especially when compared to subjective evaluations. Moreover, as mentioned above, standardization allows a comparative analysis among separate studies (e.g. meta-analysis).

A standardized scale demonstrates reliability, that is, it possesses the ability to solicit *repeatable* scores with small variations among a single sample (Nunnally, 1978). Calculating a coefficient alpha is one way to estimate the reliability of a scale. In the social sciences, a coefficient alpha of .70 or higher is considered acceptable (Nunnally,

1978). The small variations reflect measurement errors, or the error score. In a perfect world, measurement error would not exist and the scale would only deliver a true score. A true score is absolute and unobtainable (Hudson, 1982). The formula of measurement error adds the true score to the error score, resulting in the observed score. This observed score is used to judge the value of the scale.

A valid standardized scale demonstrates proficiency in evaluating what it is designed to measure (Hudson, 1982; Kline 2000). Validity can be assessed in multiple ways, among them are: 1) face, 2) content, 3) criterion, 4) construct, and 5) factorial (Hudson, 1982; Nunnally, 1978). Table 1 displays each of these types, sub-types and its function. When a standardized scale demonstrates affirmative evidence of validity testing and reliably measures the desired dimension, it has promise as a standardized resource and a common resource for practitioners and researchers. The validity categories offer distinct avenues to scrutinize a scale and its items. Questions surround how well the item, items, or the entire scale performs under the various testing strategies.

Another aspect of a research study that requires similar methical consideration is internal and external validity. Internal validity refers to the extent to which empirically collected data are a direct result of the experimental stimulus and not the effect of other factors (Rubin & Babbie, 2001). External validity, by contrast, addresses the extent to which findings can be appropriately generalized beyond the conditions of the study (Royse, 1991).

When a study is attempting to establish a cause-effect link, then internal validity issues are of paramount concern (Garson, 2002). The focus here is eliminating or minimizing bias that may affect the ability to make cause-effect inferences. Examples of

Table 1

Measurement Validity Categories

Type	*Function*
Face	Face validity is applicable when concept is new and relatively unexplored. Experts in field make a subjective assessment and approve scale when it appears to measure the identified concept.
Content	Content validity considers how well the scale includes an adequate range of the measured construct's meanings. The consensus among experts also considers the scale's development process.

Criterion
 	
• Predictive
 	
• Postdictive
 	
• Concurrent
  • Concurrent Instrument
 	
  • Known Groups
	Criterion validity involves determining relationships through correlations with external criteria (Hudson, 1982).
	• Predictive validity exists when the scale accurately predicts an association to another well-defined criterion, regardless of when predicted outcome occurs.
	• Postdiction validity accurately reveals the existence of a past variable
	• Concurrent validity accurately informs of a present variable.
	  • Concurrent Instrument method is tested by comparing the new scale with a standardized scale that measures the same construct.
	  • Known Group methods intentionally compare at least two groups with each other because one group is expected to have more or less of the measured attribute.

Construct • Convergent • Divergent	Construct validity is evaluated by determining the strength of the relationship the scale has with other scales. • Convergent validity anticipates a strong correlation with a scale that measures a highly related theoretical construct. • Divergent validity expects the scale to correlate poorly with a scale that measures an unrelated theoretical construct.
Factorial	Factorial validity examines the correlational relationships between a scale's items and the scale's total score in relation to another scale/subscale using a factor analysis. When an item on a scale has a strong correlation with its own scale's total score and weak correlation with a contrasting scale's total score, it is considered to be a valid measure of the construct.

this include: 1) Hawthorne effect – suggests performance is enhanced simply because it is being tested, 2) Control group awareness – repercussions expected when a control group knows they are not receiving the experimental variable, and 3) Compensatory equalization of treatments – raters intentionally or unintentionally compensating for the control group(s).

In contrast, the threats to external validity include: 1) Reactive or interactive effect of testing – potential reactions, behaviors, or responses of participants that could influence the testing process/results, 2) Interaction effects of selection biases and any research stimulus (if participants are not selected through randomized sampling, important differences may exist between those who participate in the study and those who do not), and 3) Reactive effects of arrangements – possible effects of a new environment on the participant, increased anxiety and/or display of atypical behavior.

Parameters of this Literature Review

The literature addressing the "human-animal bond," with regard to relationships, attitudes, perceptions, and therapeutic evaluations from the presence or absence of a member of another species is growing exponentially (Lago, Delaney, Miller, & Grill, 1989; Netting, Wilson, & New, 1984a). The first issue of the earliest anthrozoological refereed journal, *Society and Animals*, came out in 1983. Because of the diversity of populations, disciplines, and subject matter, the literature for this interest area is found in a multitude of places. The following search strategies were used to complete an exhaustive literature review.

These keywords were used in each of the databases: 1) "pet attachment," 2) "human animal bond," and 3) "pet ownership." The following databases were searched:

MetaSearch, Animal Behavior Abstracts, PsycARTICLES, PsycINFO, PubMed, Social

Science Abstracts, Social Work Abstracts, NASW Clinical Register, Mental

Measurements Yearbook, and Dissertation Abstracts. The most abundant database was

PsycINFO, retrieving publications dated back to 1872. Once a comprehensive list of

scales was identified, each scale was searched individually using its name in quotations in

the PsychINFO database.

A snowball source of additional literature was followed-up from each book,

chapter, article, proceeding, and internet source. The non-profit and recently merged

organization Animals and Society Institute maintains a database of U.S. and foreign

Doctoral dissertations that were awarded from 1980 to the present. Every entry in this

database was reviewed on February 10, 2005.

Lastly, contact was made with David K. Anderson, former librarian at the

University of California - Davis (D.K. Anderson, personal communication, March 26,

2005), well known within the anthrozoological community as an expert on the

anthrozoological literature. In 2005, he submitted a manuscript for a book that has since

been published, *Assessing the human-animal bond: a compendium of actual measures*

(2006). This book is a compilation of qualitative and quantitative studies that measure

various aspects of interspecies relationships. He graciously sent this author his

manuscript's bibliography for comparisons, to ensure a thorough identification of

existing scales.

Scales Measuring Canine-Human Relationships

Measures and research strategies that target how humans relate and interact with a

member of another species are numerous and varied. A consensus exists around the

complexity of relationships humans have with a member of another species (Johnson et al., 1992; Lago et al., 1988, Staats et al., 1996; Zeglen, 1984). Investigators and authors who contribute to the interspecies relationships knowledge base come from varied disciplines, such as ecology, ethology, geology, sociology, biology, psychology, psychiatry, philosophy, nursing, occupational therapy, social work, and veterinary medicine. Studies examining interspecies relationships, particularly linkages between human health and "attachments" to a member of another species, are not well understood or explained (Zasloff, 1996). Moreover, agreement on the key elements that explain the human connection with canines has not been attained through research or a unifying theory.

Criteria were developed to select scales for an in-depth critique. Critiques of the scales were based on the authors' peer-reviewed publication(s). The initial selection criteria required the scale to be applicable to canine and adult human relationships and the samples to be collected primarily from a population in the United States. The third criterion required at least one of the following:

1) the scale was used in a minimum of five studies

2) the scale extended the knowledge base by addressing a unique variable

3) the scale utilized rigorous methodology

See Table 2 for the selected scales and the criteria met for their inclusion in this dissertation. Appendix A contains a list of anthrozoological research that were not considered due to its inapplicability to this research project, while Appendix B provides a comprehensive list of human-canine scales that were under consideration. The decision to narrow the scope of the critique allows for an intimate critique, especially of frequently

Table 2

Criteria met by Selected Scales

Scale	*Authors & Year*	*Number of studies using scale*	*Unique variable*	*Rigorous methodology*
Pet Attitude Scale (PAS)	Templer, Salter, Dickey, Baldwin, & Veleber, 1981	20		Evidence of empirical validity
CENSHARE Pet Attachment Survey (CENSHARE-PAS)	Holcomb, Williams, & Richards, 1985	8		
Contemporary Companion Animal Bonding Scale (CABS)	Poresky, Hendrix, Mosier, & Samuelson, 1987	23		Evidence of empirical validity
Pet Relationship Scale (PRS)	Lago, Kafer, Delaney, & Connell, 1988	7		Evidence of empirical validity
Lexington Attachment to Pets Scale (LAPS)	Johnson, Garrity, & Stallones, 1992	7	attempted to identify "weak attachments"	Evidence of empirical validity and random digit-dialing telephone survey
Inventory of Pet Attachment (IPA)	Andrews, 1992	1	attempted to identify the continuum of "attachment"	Evidence of empirical validity and used inter-rater agreement
Miller-Rada Commitment to Pets Scale (CPAS)	Staats, Miller, Carnot, Rada, & Turner, 1996	3	introduced "commitment" concept	
Comfort from Companion Animal Scale (CCAS)	Zasloff, 1996	3	attempted to neutralize language to reduce speciesism	

used scales. The intent is that this review will help to illuminate limitations and strengths of the psychometric properties in each of the scales and their results.

The Appendices contain each of the selected scales. The Pet Attitude Scale (PAS) (Templar, Salter, Dickey, Baldwin, & Veleber, 1981) is in Appendix C, while its modified version follows in Appendix D (Munsell, Canfield, Templer, Tangan, & Arikawa, 2004). The CENSHARE Pet Attachment Survey (CENSHARE-PAS) (Holcomb, Williams, & Richards, 1985) is in Appendix E. The Companion Animal Bonding Scale (CABS) (Poresky, Hendrix, Mosier, & Samuelson, 1987) is in Appendix F. The Pet Relationship Scale (PRS) (Lago, Kafer, Delaney, & Connell, 1988) is in Appendix G. The Lexington Attachment to Pets Scale (LAPS) (Johnson, Garrity, & Stallones, 1992) is in Appendix H. The Inventory of Pet Attachment (IPA) (Andrews, 1992) is in Appendix I. The Miller-Rada Commitment to Pets Scale (Staats, Miller, Carnot, Rada, & Turner, 1996) is in Appendix J. The Comfort from Companion Animal Scale (CCAS) (Zasloff, 1996) is in Appendix K.

The literature review revealed 89 studies that represent a breadth of interest attempting to quantify some dimension that exists between humans and a member of another species. Of these, 68 were rejected because they:

- o studied outside the borders of the United States (reduce national/cultural differences)
- o excluded human-canine relationships
- o targeted interspecies interventions within the therapeutic setting (eliminate professional and paraprofessional relationships)
- o lacked accompanying research documentation

- examined attitudes outside the scope of personal interspecies relationships (i.e., students, general public)

- elected to use alternative methods in the research design (i.e., did not use a self-report scale)

- used only children and adolescents within the research design

- focused on the death or loss of a member of another species

- assessed perpetrator behavior (i.e., domestic violence/animal cruelty)

- used invasive procedures to assess physiological responses (e.g., venous blood samples collected)

Appendix A contains the above-referenced 68 studies. Labels for each of the categories in this table were based largely on the authors' report of the measured dimension or the venue in which the instrument was used.

The remaining 21 scales vary in what construct they claim to measure (see Appendix B) and were considered for the selected scales. Dimensions include attachment, attitudes, bonding, commitment, emotion/affect, expectations, perception, personality of the species other than human, physiology, and various other relationship features. Again, the identified categories chiefly used the authors' choice of words in how they described their measured concept.

<center>Critique of Selected Scales</center>

The anthrozoological literature reflects the continuing quest for understanding, quantifying, and capitalizing therapeutically on interspecies relationships. The working assumption that each author of the selected scales seems to make is that the strength or weakness of the metaphorical adhesive between the human and canine is measurable

through self-rated observations. Furthermore, the expectation is that once the observations are identifiable and subsequently quantifiable, they may help to explain demographic associations and relationship features in a variety of settings and circumstances.

The critique of the selected scales examines how psychometrically sound each of the selected scales are based upon the author's publication(s). The driving questions that led this critique were:

1) What was the theoretical orientation of the measured concepts?

2) What was the process for scale development?

3) What are the conceptual and operational definitions of the measured concepts?

4) What evidence exists for the reliability and validity of collected scores?

5) What were the demographics collected for the human and the member of another species?

6) What are the emerging themes and gaps?

Before beginning this review and discussion of those who have previously published, an important disclaimer note. This author has had and continues to have a life of warm, meaningful memories from canine companionship. These cherished relationships are irreplaceable.

Critique of each scale used one or more publications submitted by the author(s). This author recognizes the fact that journals limit the number of words per submission; therefore, complying with these restrictions results in forced omissions. Moreover, while this author reviewed each article as a formal research report, this may not have been the intent of its author(s).

Methodology

Purpose of Selected Scales

  Study Purpose. The purpose for a study provides the overarching and guiding mission for conducting the research. The hypothesis describes how the individual study contributes, or meets that end. More specifically, the hypothesis predicts the relationship between the independent and dependent variables (Rubin & Babbie, 2001). Displayed in Table 3 are the stated purpose and often-inferred hypotheses for each of the eight selected scales.

Theoretical Framework

  Observers of Michelangelo's centuries-old art, whether in paintings or sculpture, may notice the masculine features he gave to the female physique. Unbeknownst to some, Michelangelo skinned male corpses in order to improve upon his intricate portrayals of the human anatomy (Nardini, 1999). By dissecting these male bodies, he became intimately familiar with this gender's muscular and skeletal structure. Perhaps inadvertently, he gave masculine features to the female figure. Similarly, studying and conceptualizing the "human animal bond" has largely been synthesized using the model of human-human relationships and experiences.

  When studying a specific social phenomenon, researchers usually identify a theoretical framework. Applying this framework imposes on the study a structure or a figurative map to conceptualize and ultimately predict the investigated social interaction. A scientific theory has been defined as, "a set of related assumptions that allows scientists to use logical deductive reasoning to formulate testable hypotheses" (Feist & Feist, 2001, p. 4). Nugent (1987) offers this characterization of a theory: "a set of

Table 3

Purpose and Hypothesis for Selected Scale Studies

Scale	*Purpose*	*Hypothesis*
Pet Attitude Scale - Templer et. al., 1981	"...to construct a scale for measuring the favorableness of attitudes toward pets." (p. 343)	Inferred: PAS scores will detect significant differing levels of favorableness of attitudes towards pets between SPCA kennel employees and MSW students.
CENSHARE Pet Attachment Survey - Holcomb et al., 1985	"...to determine whether the [CENSHARE] instrument in question validated statements about attachment." (p. 28) "...create a more accurate instrument." (p. 28)	"1. Primary caregivers will record higher scores than non-primary caregivers. 2. A member of another species (dog or cat) will not be a significant variable in scores. 3. Females record higher scores than males. 4. The larger the social support network, the lower the score. 5. Pet loss clients will record higher scores than others." (p. 29)
Contemporary Companion Animal Bonding Scale - Poresky et al., 1987	"...provide a sensitive scale for the assessment of self-reported behavior indicative of the establishment of a bond between person and an animal." (p. 744)	Inferred: 1. A significant relationship does not exist between "ownership" and high CABS scores. 2. The greater number of behavioral indicators, the greater the "bonding" between a human and another speces.
Pet Relationship Scale - Lago et al., 1988	Validation study was "based on comparison of the PRS scales with the Pet Attitude Scale" (p. 240)	Inferred: Strong correlations exist between the PRS and PAS scores.
Lexington Attachment to Pets Scale - Johnson et al., 1992	1) "...develop a scale with a more practical (i.e., smaller) number of items" (p. 165) 2) "...develop and evaluate a measure of pet attachment that is reliable and for which some preliminary evidence of validity can be provided" (p. 172)	Inferred: The greater the human emotional tie is toward a member of another species, the greater the "attachment" is to that member.

Table 3, continued

Scale	Purpose	Hypothesis
Inventory of Pet Attachment - Andrews, 1992	Primary: "Is there a level of attachment above which the benefits of owning a pet actually diminish?" (p. 1) Secondary: What is "the degree to which varying levels of attachment are associated with psychological systems, mood states and socialization factors?" (p. 3)	1. Significant and positive correlations exist between IPA and CABS & PAS. 2. No correlation between Marlowe-Crowe Index of Social Desirability & IPA. (p. 22) Phase three: 1. Pre-selected clients will score higher on IPA vs. randomly selected. 2. SCL-90-R & MAACL will differentiate the two groups of clients, with the pre-selected scoring higher. 3. Clients "who scored highest on IPA were expected to report attenuated socialization compared to those in the lower ranges." 4. A positive, linear relationship was predicted between psychological correlates and the IPA. 5. Clients who scored higher on IPA were expected to also score higher on the measures of psychological symptoms. 6. "Pre-selected pet owners would be stronger advocates of animal rights than the random pet owners." 7. "A positive correlation was expected between the attitudes towards animal rights and the IPA scores." (p. 22-23)
Miller-Rada Commitment to Pets Scale - Staats et al., 1996	"...add to the understanding of the human animal bond by introducing the concept of commitment to pets and by distinguishing this concept from that of attachment to pets." (p. 88)	"Attachment and commitment will be positively related but will share only a moderate amount of common variance." (p. 89)
Comfort from Companion Animal Scale - Zasloff, 1996	"...examine attachment in terms of the perceived level of emotional comfort that dog owners and cat owners report receiving from their pets" (p. 44)	"...no differences would occur in the perceived level of emotional comfort reported by dog owners and cat owners when only emotional factors were assessed." (p. 44)

concepts – a conceptual scheme – freely and purposefully created by the human mind to represent the phenomenon of interest" (p. 15). Feist & Feist (2001) suggest that a useful theory yields affirmative responses to the following questions: 1) Does the theory generate research? 2) Is it falsifiable? 3) Does it organize and explain knowledge? 4) Does it suggest practical solutions to everyday problems? 5) Is it internally consistent? and, 6) Is it parsimonious? While theories are not necessary for every study, they can add value to the study (Rubin & Babbie, 2001).

Three of the selected eight scales based their items on an explicit theoretical framework. Holcomb et al. (1985) used the work of Ainsworth's human infant caregiver attachment model. Johnson et al. (1992) used social support theory, while Andrews (1992) relied on Bowlby's Attachment Theory, Harlow's Surrogate Mother model, and Ainsworth's Strange Situation to conceptualize what draws the human toward the a member of another species. Unspecified theoretical literature (Lago et al., 1988) and atheoretical literature (Poresky et al., 1987; Staats et al., 1999; Templer et al., 1981; Zasloff, 1996) guided the remaining five scales. Staats et al. (1999), for example, proposes that commitment can help explain the survivability and endurance of a relationship between a human and a member of another species. With no referenced material for this construct of commitment, these authors define commitment as, "resolve to keep a pet in spite of challenges that require expenditures of personal resources" (p. 88). One could argue that commitment as previously defined, describes a relationship wherein the needs of a member of another species could surpass that of the human.

In a commentary, Kidd & Kidd (1987) use three classifications models to summarize theories applied to the "human/companion animal bond." They are: 1)

animal/animal, 2) human/human, and 3) human/object relationships. The animal/animal

relationship is illustrated by the work of ethologists who contend that animal social

behavior is driven by its survival value for the species and individual. Kidd & Kidd

(1987) dismiss this approach because of its "limited application" to relationships among

humans and a member of another species. Conversely, these authors claim that using the

human/human relationships template has "helped explain a large number of current

human/animal attachment studies" (p. 141) but also acknowledges its flaws and

limitations. They contend the only stated benefit of viewing human relationships with a

member of another species through the animal/object relationship lens is that helps to

explain the notion that "pets and objects provide security and comfort" (p. 143). Kidd &

Kidd (1987) conclude that each classification model individually, is clearly inadequate to

explain the "human-animal bond" and even when they are used collectively, significant

gaps still exist.

Barba (1995) critically reviewed 52 conveniently collected publications from

1988 to 1993 addressing research of the "human/companion animal relationship." Of

these 52 studies, 26% expressly described the conceptual or theoretical framework of

their study. The most frequently cited framework, either through an explicit or implicit

statement, belonged to social support theory (8%). Social support in this context refers to

the presence of a member of another species providing an opportunity for immediate

social interaction and creating other opportunities where the human receives social

support/interaction from other human companions. What followed were two studies

using Bowlby's attachment theory and two others using an applied biopsychosocial

theory. Bowlby's (1969, 1973, 1977) attachment theory suggests that humans have an

innate behavioral drive to make connections with others in order to secure survival of the individual and of the species. This drive helps to explain an adult's significant emotional connection to their children and the child's reciprocal behavior. Biopsychosocial theory integrates and acknowledges the complex interaction of biological, psychological, and social factors in predicting human behavior.

A review of the literature reveals other examples of human-human (intraspecies) relationship models being applied to interspecies relationships. These include: exchange theory (Netting, Wilson, & New, 1987); family development theory (Albert & Bulcroft, 1987); life-span development theory (Netting et al, 1987); psychological support theory (Collis & McNicholas, 1998); and social role theory (Netting et al., 1987). Contrast these human models, which tend to focus on psychological aspects, with "animal models," which prioritize physiological fitness.

The literature also references the work of eminent biologist, Edward O. Wilson, and his theory of biophilia as a way of explaining the connection, actually the dependence, humans have on nature and its creatures (Brown, 2004; Kellert & Wilson, 1993). He defined biophilia as the "innate tendency to focus on life and lifelike processes" (Wilson, 1984, p. 1).

Brown (2004) re-introduces concepts of self-psychology and hypothesizes that this framework may help explain why humans seek and maintain companionship with a member of another species. The "self" is a psychological structure that represents the core of the personality and the "selfobject" is what the human projects onto that member of another species. This projection fulfills the human's needs to promote cohesion for self. She describes the three archetypal types as mirroring, idealizable, and alter-ego

selfobjects. Mirroring selfobjects supply the self with "affirmation, confirmation, and recognition of the self in its grandness, goodness and wholeness" (p. 72). Idealizable selfobjects serve the self with the opportunity to be associated with something that is admired and respected. Alter-ego selfobjects, also known as twinship selfobjects, are described as sustaining the "self by providing the experience of essential likeness of another's self" (p. 72).

Perhaps the best approach in deciding which theoretical framework to apply requires consideration of the study's purpose, species of interest, and consideration of previous studies using the same premise. Is the purpose to determine health benefits for one or both animals? What is the need that one animal fulfills for the other animal? Or, what is the binding agent for the two animals? Is only one of the animals of interest? Or, are both animals of interest? What evidence does the literature offer for your theory of choice? Ultimately, theoretical progress is made when the framework is clearly defined, determining how it will predict outcomes, if it is testable, and its results reflect the hypothesis.

Conceptual and Operational Definitions of Measured Concepts

In order to deliver accurate generalizations, inferences or explanations of the measured concept, an operational definition of the investigated concept during the formulation of the study is necessary. This definition clearly states with precision, tangible observations and boundaries of the investigated concept. Without this crucial element, researchers and readers are left to make their own interpretation of the study's findings.

At a minimum, a sound methodological approach includes a nominal or conceptual definition to fulfill a necessary step in measurement. This definition is a set of words or synonyms used to describe the concept prior to data collection (Bloom, Fischer, & Orme, 2003). Authors in the anthrozoological field have opted to use this conceptual definition, to describe the latent variable *human-animal bond* or *pet attachment*. When the word "pet" or phrase, "companion animal" is used, what meaning, perception, or interpretation exists with the writer and reader? What impact, if any, does this conceptual framework have on the outcomes and discussions of a study?

There were three attempts to directly define *attachment* in the selected scale publications. Most reported that their scale measured the concept of *attachment* or *bonding,* without an accompanying definition, instead they used the themes that emerged through an exploratory factor analysis to provide a nominal definition. For example, Lago et al., (1988) suggests that both the PRS (i.e., affectionate companionship, equal family member status, and mutual physical activity) and the PAS (i.e., attitude toward a member of another species) "represent reasonable operational definitions of pet attachment" (p. 251). Unfortunately, in the absence of a clear and pre-data collection explanation, the reader creates their own interpretation of adult "attachment" to a member of another species. While these explicit operational definitions were absent, authors did specify what they believed their scale to measure. Table 4 displays the selected scales, their declared measured concept and corresponding definition and/or themes that emerged through the factor analysis.

The choice of words Andrews (1992) used to describe "high attachment" were "psychopathological...noiser...eccentric...neurotic qualities...and unhealthy attachments."

Table 4

Measured Concepts and Definitions/Emerging Factors of Selected Scales

Scale	Measured Concepts	Definition/Emerging Factors
Pet Attitude Scale - Templer et. al., 1981	"favorableness of attitudes towards pets" (p. 343)	3 factors emerged from analysis: 1) "love and interaction" 2) "pets in the home" 3) "joy of pet ownership" (p. 343)
CENSHARE Pet Attachment Survey - Holcomb et al., 1985	"degree to which individuals are attached to their dogs and cats" (p. 32)	2 factors emerged from analysis: 1) "relationship maintenance ...behaviors broadly related to physical and sensual interaction; communication; time and financial investment" (p. 32) 2) "Intimacy ...attitudes surrounding emotional importance; physical proximity; planning for close physical proximity" (p. 32)
Contemporary Companion Animal Bonding Scale - Poresky et al., 1987 - *Poresky, 1989	"...individual's bond with a pet" (p. 746) *...interaction with or attachment to a pet by asking behavioral questions..." (p. 237)	3 factors emerged from analysis: 1) "bonding or involvement factor" 2) "animal size (inferred from sleeping arrangements)" 3) "companion animal's responsiveness and autonomy" (p. 746) *"Attachment (or love) is characterized by behaviors that involve caring and proximity seeking" (p. 240)
Pet Relationship Scale - Lago et al., 1988	"pet attachment" (p. 251)	3 factors emerged from analysis: 1) "affectionate companionship" 2) "equal family member status" 3) "mutual physical activity" (p. 252)
Lexington Attachment to Pets Scale - Johnson et al., 1992	"emotional attachment" (p. 160)	Attachment was inferred to mean the "range of affective ties that pet owners feel for their animals" (p. 163) 3 factors emerged from analysis: 1) "general attachment" 2) "people substituting" 3) "animal rights/animal welfare" (p. 169)

Table 4, continued

Scale	Measured Concepts	Definition/Emerging Factors
Inventory of Pet Attachment - Andrews, 1992	"Nonconventional attachments" as defined by: "unhealthy attachment" (p. iii)	Nonconventional attachment: "the degree to which pet owners feel emotionally close to their animals" (p. 1) as exhibited by clients who "took on eccentric or neurotic qualities: those that called or visited the clinic frequently, demonstrated a great deal of physical affection toward their pet, excessively 'cooed' toward or talked about their pet, and verbalized unusual amounts of worry and anxiety, particularly in response to mild or routine problems" (p. 52)
Miller-Rada Commitment to Pets Scale *Miller-Rada Attachment to Pets Scale - Staats et al., 1996	"commitment" and *"attachment" (p. 89)	Commitment: "resolve to keep a pet in spite of challenges that require expenditures of personal resources" (p.88) 3 factors emerged from analysis: 1) unspecified 2) "commitment to an adult pet" 3) "commitment in the face of need for extensive veterinary care" (p.90) though could be uni-dimensional *Attachment: "affection" (p. 93)
Comfort from Companion Animal Scale - Zasloff, 1996	Attachment	Attachment: "perceived level of emotional comfort that dog owners and cat owners report receiving from their pets" (p. 44)

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These terms to describe such "non-conventional attachments" are fraught with value judgments. Contrary to the use of such descriptors in this study, results indicated that although these humans "had fewer social contacts and confidantes, their ability to feel and establish closeness to a significant other was not impaired" (Andrews, 1992, p. 52). Therefore, the hypothesis that a decreased quality of close relationships would be reported from the "nonconventional attachment" or pre-selected group was rejected.

Scott (1992) differentiates attachment from bonding by the number of animals involved. Bonding ordinarily exists only between two animals who are "metaphorically tied to each other" (p. 73). Conversely, attachment occurs with one, two or more animals in social and asocial situations. Attachment in the social setting implies mutualism, wherein two or more animals have a reciprocal relationship. Attachment in asocial circumstances may only involve one animal; Scott (1992) uses the example of when an animal attaches to a site. The term "bond" has been defined in multiple ways in the context of human-human relations and those among humans and other species, for example, mutual dependency (Campbell, 1996), bidirectional (Tannenbaum, 1995), or even unidirectional bonding (Bayne, 2002). Campbell (1996) illustrates mutual dependency in the context of the mother-infant symbiosis, and furthers the description with, "The prime objective of bonding is preservation of the life of the infant..." (p. 101). Tannenbaum (1995) characterizes the "human-animal bond" as:

> ... continuous, bidirectional relationship between a human and an animal, which brings a significant benefit to a central aspect of the lives of each, which is in some sense voluntary, and in which each party treats the other not just as something entitled to respect and benefit in its own right but also as an object of admiration, trust, devotion, or love. (p. 185)

Bayne (2002) makes an argument that a bond could be unidirectional. In the context of lab animal medicine with other species, she offers instances where a staff member may become "particularly attached" to a member of another species, who in turn appears indifferent toward that human. Alternatively, a dog socialized with several people may seek out consistent companionship with a favored human.

Others have allowed the question of existing "pet ownership," that is, establishing the mere presence of a member of another species, to define bonding, but Poresky et al. (1987) argues that the "quality of the relationship or social interaction" (p. 744) between animals is what should be the key factor in defining "companion animal bonding." Keil's (1990) dissertation offers a definition of "human-animal attachment" as, "characterized by attitudes of friendship and reciprocity" (p. 15).

Serpell (1989) considers the use of the word "pet" as diluted, since it once referred to sentient species. Now, pet is used in generic ways to identify a member of another species that are considered property. Scott (1992) makes a similar claim but with the terms "attachment" and "bonding." Both have been applied in a variety of situations and have had an equal number of definitions, diminishing their strength to represent an exclusive construct.

The empirical evidence supports the notion that interspecies relations are multi-dimensional (Rooney & Bradshaw, 2003). Perhaps after adopting an alternative word or phrase for "attachment," or "bond," this term should be considered as the overarching concept, which is then comprised of multiple dimensions/variables (i.e., rewarding interactions, close proximity, comforting emotions).

Design and Sampling

　　Study Design. Conducting an effective and meaningful study requires strategic planning and preparation during each step of the process. One such step is deciding on the study design. The purpose and hypothesis are what drives the design of a study. Is the intent of the study to describe, compare, and/or predict something about an intervention or treatment approach? Will it involve random assignment of the population into two or more groups? If so, you are using an experimental design (Fink, 2003). However, if random assignment is not employed, but a control group is included, this qualifies as a quasi-experimental design (Rubin & Babbie, 2001). A third category of study designs are referred to as descriptive or observational designs (Fink, 2003) and/or, a non-experimental design (Schutt, 2001). This study design uses naturally occurring groups and without the use of any intervention, to observe or describe phenomena (Fink, 2003). Each of the selected studies describes and/or compares some dimension humans experience with a member of another species. Because these are descriptive and not experimental, each study used a non-experimental design.

　　Study Sampling Method. A sampling method describes how a sample, a portion of the desired population, is identified and invited to participate in the study. Sampling methods have two categories. When access to the entire population is available or, each person in the population has an equal chance of being selected and the selected participants represent that population, a probability sampling method is said have been used (Fink, 2003). If however, only a portion of that population is accessible or deemed necessary, a non-probability sampling method represents this category of sampling method (Fink, 2003). The distinguishing feature between probability and non-probability

sampling methods is the accessibility to or more precisely, the selection process from the identified population. Another significant feature between the two is the generalizability of the findings. Opting to use the probability sampling method with a large sample enables broader generalizations to be made of the represented population.

A common approach in the social sciences is the non-probability sampling method (Rubin & Babbie, 2001). All eight studies used nonprobability sampling methods. Once the decision is made to use a probability or nonprobability sampling method, more options exists under each category. The simplest method for the nonprobability sampling method is a convenience sample. However, the generalizability of findings is strictly limited to the narrow population that sample represents.

Five studies used a basic convenience sample (Andrews, 1992; Holcomb et al., 1985; Lago et a., 1988; Staats et al., 1996; Templer et al., 1981). These convenience samples were taken largely from the academic or veterinary medical environment. Staats et al. (1996) asked students to recruit their friends and family as participants, utilizing the snowball sampling technique (Fink, 2003). Two studies did not disclose how their participants were solicited (Poresky et al., 1987; Zasloff, 1996). The nonprobability sampling methods among the eight selected scales are summarized in Table 5. Johnson et al. (1992) used randomization in their convenience sample selection. Using professional interviewers, these authors elected to use a random digit-dialing telephone survey and then screened the household for the presence of a member of another species who was cohabitating and a consenting 18 year old or older adult in a metropolitan area of KY. During this approximately 16-minute interview, questions were randomized to

Table 5

Sampling Methods of Selected Scales

Scale	*Nonprobability Sampling Method*
Pet Attitude Scale - Templer et. al., 1981	Convenience samples
CENSHARE Pet Attachment Survey - Holcomb et al., 1985	Phase 1: Convenient & Censored (excluded appts for euthanasia (EU) Phase 2: Convenience with special EU codes
Contemporary Companion Animal Bonding Scale - Poresky et al., 1987	Unknown
Pet Relationship Scale - Lago et al., 1988	Convenience sample
Lexington Attachment to Pets Scale - Johnson et al., 1992	Systematic random sampling by using a random digit-dialing telephone survey in Fayette County, KY (approximate population: 250,000)
Inventory of Pet Attachment - Andrews, 1992	Phase 1: Convenience Phase 2: Convenience with systematic sampling selection Phase 3: Control Group selected from convenience sample by systematic procedure Pre-selected group selected from convenience sample by censored procedure
Miller-Rada Commitment to Pets Scale - Staats et al., 1996	Snowball sampling
Comfort from Companion Animal Scale - Zasloff, 1996	Unknown

minimize order effects (Grovers, 1989). Andrews (1992) also used the systematic

random sampling technique, but only in the second phase of her study.

Scale Development Process

Scale item content is largely directed by the theoretical framework and the

operational definitions. Scale development involves several steps. DeVellis (2003)

proposes these scale development steps: 1) identify precisely what will be measured, 2)

generate an item pool, 3) determine the measurement format, 4) ask experts to review

item pool, 5) consider including validation items, 6) administer items to pilot sample, 7)

evaluate items, and 8) optimize scale length.

A substantial amount of the research performed in the area of how humans relate

to a member of another species is still exploratory research. The majority of the

methodological approaches by the selected scales are no different. Although the selected

studies are considered quantitative studies, most of these studies are strikingly similar to

qualitative studies because of the lack of specificity in operationalizing the tested

variables. Rubin & Babbie (2001) explain,

> In purely qualitative studies, we do not predetermine specific,
> precise, objective variables and indicators to measure. Instead, we
> emphasize methodological freedom and flexibility so that the most
> salient variables, and their deeper meanings, will emerge as we
> immerse ourselves in the phenomena we are studying. (p. 140)

Five of the eight authors approached scale development through multiple phases

(Andrews, 1992; Holcomb et al., 1985; Johnson et al., 1992; Lago et al., 1988; Templer

et al., 1981). The initial phases eliminated items by correlational analyses. Additionally,

six of the eight authors' used other instruments to address validity concerns (Andrews,

1992; Holcomb et al., 1985; Johnson et al., 1992; Lago et al., 1988; Poresky et al., 1987;

Templer et al., 1981). The following Likert scales were used to distinguish among agreement responses in all of the selected scales: four-point (Holcomb et al., 1985; Johnson et al., 1992; Lago et al., 1988; Zasloff, 1996); five-point (Poresky et al., 1987; Staats et al., 1996); and seven-point (Andrews, 1992; Templer et al., 1981). Two author groups used reverse scoring (Johnson et al., 1992; Templer et al., 1981).

The authors of the selected scales unanimously intended to develop a meaningful scale that adeptly measured a variable/dimension that explained the extent to which humans relate to a member of another species. However, the process Rubin & Babbie (2001) described above in conducting qualitative research paralleled much of the same process used by five of the eight selected authors. These researchers labeled the variable(s) as "favored attitude," "attachment," or "bond." Avoiding any precise indicator, the authors loosely considered these dimensions as capturing the human's emotional or limbic system-related experience. Some of these labels were even used interchangeably, as shown by the later authors making inter-article references and comparisons. Refinements in the description of this emotional experience occurred after the analysis, allowing the salient activities, descriptors, and/or experiences of the respective sample to emerge. Using an exploratory factor analysis, subscales emerged from the retained item pool and the subjective interpretation of these commonalities became the enhanced description of the theoretical variable (i.e., favored attitudes, attachment, or bond).

Assuming common themes existed among the subscales, this author attempted to classify each of the selected scales or its subscales. Assigning each subscale or scale under the newly created categories was not easy. In fact, not every subscale could be

appropriately confined to one category. Using the author's subscale elaboration/scale items, three of the subscales required multiple assignments. Challenges to these classifications would be easy; each are profoundly related and in some instances, dependent upon another. Table 6 holds the result of this author's subjective observations.

Three veterinarians and a psychiatrist coined the popular phrase "human-animal bond" in 1977 (Anderson, n.d.). These four individuals also co-founded the Delta Society, the first professional, multi-disciplinary, non-profit organization to focus on various aspects of human and a member of another species relationships and interactions. Most of the selected researchers assert their work contributes to the area of investigating the "human-animal bond," or some similar construct thereof (Zeglen et al., 1984). Using this phrase is hugely misleading because it is semantically incorrect. The words *human* and *animal* function as a single adjective to describe the *bond*. Hyphenating these two words generally designates equal weight; unfortunately, more often than not, research unilaterally excludes one-half of this relationship. The empirical purpose cited in these and other anthrozoological studies would have been more accurate if the intention was expressed as, exploring the possible dimensions in which humans relate, why they associate, or are linked with a member of another species. The verb *relate* is defined here as, "To connect, to establish a relation between" (OED, 1989).

Jasper & Nelkin (1992) write, "Renewed concerns about animals have generated a powerful social movement driven by a simple moral position: animals are similar enough to humans to deserve serious moral consideration" (p. 3). Researchers are ethically bound to follow treatment standards for members of other species, as they must for humans (e.g., American Psychological Association, 2002). In the animal-assisted therapy

Table 6

Scale and Subscale Themes

Scale	Rewarding Interaction	Close Proximity	Comforting Emotions	Unrepeated Subscales
Pet Attitude Scale	*Interaction	Pets in the home	*Love; Joy of pet ownership	
CENSHARE Pet Attachment Survey	Relationship maintenance	*Intimacy	*Intimacy	
Companion Animal Bonding Scale	Bonding; Other species responsiveness	Animal size (sleeping arrangements)		
Pet Relationship Scale	Affectionate companionship; Mutual physical activity			Equal family member status
Lexington Attachment to Pets Scale			General attachment	People substituting; Other species rights/welfare
Inventory of Pet Attachment	*Attachment		*Attachment	
Miller-Rada Commitment to Pets Scale				Commitment
Comfort from Companion Animal Scale			Attachment	

* Multiple assignments

setting, Heimlich (2001) observed stress in her service dog and urges, "Consideration of a service animal's health and well-being is an important ethical issue which must not be overlooked" (p. 51). Within the context of studying human relationships with members of other species, integrating a substantial number of observations of that member or their experience is hardly a standard in the empirical research. Attempts to integrate these observations or experiences are seriously deficient in the literature (Sanders & Arluke, 1993; Serpell, 1983, 1996; Zeglen et al., 1984). Incorporating the perspective of a member of another species is not without a myriad of challenges. Obviously, canines do not have the physical agility or share a common language to complete a self-report survey designed for humans. However, an experienced eye could assess canine behavior, providing some insight into at least which aspect of the autonomic nervous system is activated (Milani, 1986).

The nature and complexity of interspecies relationships are frequently mentioned in the literature (Johnson et al, 1992; Lago et al., 1988; Staats et al., 1996; Zeglen, 1984). The complexity of this relationship, combined with insufficient knowledge, may help to explain the lack of sophistication of the anthrozoological field to take on an all-encompassing, comprehensive approach to relationships among humans and members of other species. Therefore, this field's integrity will depend on acknowledging its limitations. From the human perspective, scales most often address the psychological (i.e., subjective report), behavioral, interpersonal, and physiological elements of the relation between humans and members of other species. Dimensions of this relationship that are rarely mentioned are the affective (i.e., observed facial expressions), financial, cognitive, spiritual and professional areas. Viewing the relationship between humans and

any other species as uni-dimensional is shortsighted and inappropriate (Johnson et al., 1992).

Every selected scale asked the human at least one question about their subjective interpretation of their interspecies companion's activity, behavior, reaction, awareness, and/or interaction (e.g., Your pet is aware of your different moods; I really like seeing pets enjoy their food). Collecting data around the human's perception of a member of another species provides some insight into how this member is perceived to contribute to their interactions or relationships. Unfortunately, when the researchers of the selected scales asked multiple items of this nature, not one created an anthropomorphic subscale, wherein the human's perception of the subjective state is solicited. Dwyer, Bennett, & Coleman (2006) have created a subscale titled, "Dog-Owner Interaction." Unfortunately, this subscale only collects data about the activities in which the human engages the canine with and not one inquiry about the canine's receptiveness or engagement level.

Few have investigated how members of other species relate to their human companions. Budge, Jones, & Spicer (1997) developed and evaluated what they considered a promising compatibility assessment instrument, the Animal-Human Compatibility Scale (AHCS). Compatibility in the context of "human-companion animal relationship[s]" was defined as, "the fit between the animal and the owner on physical, behavioural and psychological dimensions, as perceived by the owner" (p. 82). What follows are three other examples of how researchers incorporated a dimension of a member of another species.

Miller & Lago (1990) explored the relationship between observed behaviors and reported attitudes. This exploratory study interviewed elder women ($N = 46$) in

Pennsylvania who shared their home with either a cat or dog. Data were collected to examine if any relationship existed between a woman's behavior and attitude toward the member of another species who cohabitated with them. Attitude was measured by the completed PRS (Lago et al., 1988), plus an additional PRS subscale referred to as the dominance scale created specifically for this study. Behaviors were measured by the interviewer's subjective observations. After leaving the elder's home, the interviewer made note of specific behaviors between the respondent and their dog, the dog's behavior toward the respondent, and the dog's behavior toward the interviewer. Citing multiple and significant limitations of this pilot study, Miller & Lago (1990) hesitated to suggest that the displays of affection observed between the respondents and their dogs did not correspond with their self-reported attitude. The authors also cautiously reported that women who indicated having affectionate relationships appeared to live with dogs who were more likely to display socially outgoing behavior. In other words, an affectionate relationship appeared more related to the dogs' socially outgoing behavior toward the interviewer and not toward their human companion.

In another study examining the interactional effects between humans and dogs, researchers in Germany examined what impact the attentional state of humans would have on dogs consuming forbidden food (Call, Bräuer, Kaminski, & Tomasello, 2003). After two experiments, results indicated that the dogs (N = 12) were indeed sensitive and less likely to retrieve this food when humans were looking at them than when their eyes were closed or they were looking elsewhere.

Gosling, Kwan, & John (2003) attempted to determine if canine personality differences existed and if so, the accuracy of assessing these personalities in dogs and

their human companions. To determine the existence and accuracy of personalities, data collection targeted consensus, internal consistency and correspondence information. Canine Consensus was determined through the submitted personality assessments from the dog's human companion and another familiar human (familiar with the canine). Internal consistency was established if agreement existed between the dog's human companion and the familiar human. These personality judgments were based on a four-dimensional model. This model used Energy (analogous to human Extraversion), Affection (analogous to human Agreeableness), Emotional Reactivity (analogous to human Neuroticism) and Intelligence (analogous to human Openness/Intellect) for the canine categories.   Similarly, the personality of the dog's human companion was assessed by the familiar human and by the human companions themselves. The categories used for the human were the analogous categories. Correspondence was determined by comparing the human companion's judgment with that of an independent observer at a dog park. According to the results, the human companion, familiar human and independent observer agreed equally well ($p < .05$) on the personality of the dog and of their human companion.

Evidence of Reliability and Validity for Collected Scores

During the course of developing the selected scales, over half of the authors' collected more than one data set. The maximum sample size ($N = 412$) among the scales overshadowed the smallest sample in a phase ($N = 29$).

Most anthrozoological studies use nonprobability sampling methods, seeking their convenience sample from the academic setting, academic hospital settings, or community

organizations (Johnson et al., 1992). The selected studies, all non-experimental in

design, were no different; all but one study used a nonrandomized convenience sample.

Unacknowledged biases were present in these convenience samples. Samples

were often taken from environments where it would be expected that like-minded people

tend to gather. When samples are taken from veterinary-like environments, it is likely

that a disproportionate number of these clients represent one end of the relational

continuum, that is, how they relate to the members of other species. A scale that is

sensitive enough to designate people along a continuum of an identified dimension would

certainly contribute greatly toward the development and validation of a standardized

scale. Identifying these subtleties requires representation of all people along the

continuum in the samples.

Templer et al., (1981) conducted the only retest reliability analysis. Two weeks

after submitting PAS responses, 29 undergraduates re-submitted PAS responses resulting

in a test-retest reliability of .92 ($p < .001$). They also were the only ones to use multiple

populations, who were believed to score differently, to test for known groups' validity.

The remaining studies relied upon the co-efficient alpha to advise about the internal

consistency of scale items. In the final analysis, the alpha range was .94 (Andrews, 1992;

Lago et al., 1988) through .74 (Holcomb et al., 1985). The median matched the mean,

.85.

Validity of the instrument was evaluated using these five types of validity: face,

content, criterion, construct, and factorial. Table 7 shows at a glance the methods used to

test each scale. All the selected studies expressed evidence of face and content validity.

Table 7

Evidence of the Selected Scale's Measurement Validity

Scale	*Face*	*Content*	*Criterion*	*Construct*	*Factorial*
Pet Attitude Scale	✓	✓	Known groups	Divergent	
CENSHARE Pet Attachment Survey	✓	✓		✓	
Companion Animal Bonding Scale	✓	✓		Convergent	
Pet Relationship Scale	✓	✓		Convergent	
Lexington Attachment to Pets Scale	✓	✓		Convergent	✓
Inventory of Pet Attachment	✓	✓	Concurrent	Convergent	
Miller-Rada Commitment to Pets Scale	✓	✓		✓	
Comfort from Companion Animal Scale	✓	✓		✓	

A common method used to test for convergent validity was to use the older scales, especially the Pet Attitude Scale (Templer et al., 1981). The convergent validity strategy makes certain assumptions. One assumption is that the chosen scale (i.e., PAS) is the benchmark. The benefit of using an established and standardized instrument for various validity tests allows for speculation as to the caliber of an introduced scale. However, one critical element is that a standardized instrument clearly states an operational definition of the measured concept. Unfortunately, Templer et al. (1981) did not attempt to define "pet attitude" or "favored attitude." Therefore, using the PAS as a test for convergence only perpetuates the uncertainty of what exact construct is measured – is it attitude, attachment, or bonding? Or, are they really one and the same? It is difficult to refute the trend of positive and significant correlations among the PAS with the CABS, PRS, and the IPA. It would appear that either the same construct or a very related construct is being measured with consistency.

Other concerns with validity are threats to external and internal validity. The lack of financial investments into the anthrozoological work severely limits sampling methods and extensive samples, which may explain the temptation to generalize findings to under-represented or absent human and other species populations. Unless samples are collected randomly, it would be inappropriate to generalize any findings. The social desirability and acquiescence effect (Kline, 2000) are also a concern here. Depending on the distribution and collection methods, people may feel especially compelled to respond favorably regarding their interspecies companion.

Lastly, attention to threats of internal validity is necessary to appropriately interpret results that may indicate causation. For instance, with measurement bias,

Zasloff (1996) provided evidence that when species-specific activities were eliminated from the scale, humans were equally "attached" *(sic)* to their dog as to their cat.

Collected Demographics of Humans and Members of Another Species

The demographic information collected in each of the selected studies overwhelmingly favored a human demographic profile. These data variables ranged from scant to moderately detailed. When authors presented only a few demographics, it is unclear if they omitted these from the final manuscript or, if they were simply not collected. The emphasis on human demographics (versus the demographics of the other species) helps to illustrate the unilateral bias of the work to date.

Three studies did not report the demographics of a member of another species (Lago et al., 1988; Poresky et al., 1987; Templer et al., 1981). The remaining five studies only identified which species the human referenced. The most frequently reported human demographic category was gender. Half of the studies collected age data. These remaining demographic categories were erratically reported: ethnicity, socioeconomic status, marital status, geographic location, history of relationships with members of other species, education, occupation, size of household, number of the other species, and current versus former species considered companions.

Two publications mention ethnicity, but comparisons were not made regarding their level of "attachment" (Andrews, 1992; Johnson et al, 1992). Brown (2003) examined ethnic differences among veterinary students ($n = 57$ Caucasian, $n = 76$ African American) in the U.S. using the Pet Attachment Questionnaire (Stallones et al., 1990). Differences were cited ($p < .001$) in "pet attachment." However, she urged extreme

caution in the interpretation of these results because not all confounding variables were controlled for, like socioeconomic status.

One study reported on the historical quality of relationships with members of other species, but none inquired about this same issue as it relates to human relationships. Religious affiliation or spiritual practice appears largely uncollected in the anthrozoological literature (Albert & Bulcroft, 1987). Another underrepresented demographic variable is the developmental stages of participants and their correlations (Stallones et al., 1990).

Wilson et al. (1987) made accommodations for those currently living with a member of another species and those who were not. This approach allowed the authors to gather information from a traditionally unsolicited segment of the population, people who do not cohabitate with a member of another species. By collecting data from all people, it begins to lay out a continuum.

Linguistics

One of the most glaring limitations revolves around the use of inconsistent and undefined language. As previously mentioned, the 1984 Delta Society Conference also recognized this as an issue worthy of attention (Zeglen et al., 1984). Holcomb et al. (1985) provide another example in the literature when they state, "the PAS appears to be a viable instrument for empirical research on the human-animal bond" (p. 33), what is the operational definition of the human-animal bond? How is the "human-companion animal bond" supposed to be conceptualized or, even "pet attachment?" Not having a standardized definition at best, or at the very least, a study–specific operational definition severely limits the inferences made from the results.

Some theorists continue to think of linguistics as a specialty area within psychology (Davis & Gillon, 2004). As the precision of the spoken or written word increases, so will our ability to understand and navigate our environment. Anthropologist Edward Sapir suggested we are at the mercy of our language in describing what our senses tell us (Sapir, 1929). Furthermore, he proposed that language influences our thoughts and behaviors. Speech, he goes on to say is a "non-instinctive, acquired, 'cultural' function" (Sapir, 1929, p. 4). Sapir cites the distinctions between our physiological destiny to walk and our use of language as an example.   While humans naturally develop the ability to become bipedal and some would rightfully argue the ability to utter sounds, the same cannot be said for our development of language. Sapir is quoted as saying,

> It is quite an illusion to imagine that one adjusts to reality essentially
> without the use of language and that language is merely an incidental
> means of solving specific problems of communication or reflection.
> (Spier, Hallowell, & Newman, 1960, p. 57)

Benjamin L. Whorf, psycholinguistic scholar, shared these same ideas about linguistic determinism before becoming a student of Sapir's and then refined this concept (Romaine, 1994). Later dubbed the Whorfian Hypothesis of Linguistic Relativity considers the language of a people and its culture to have somewhat of a reciprocal relationship. He argues that language determines our thoughts and perceptions. Whorf (1956) had two primary hypotheses: 1) that abstract thinkers are dependent upon the language, and 2) that the structure of the language influences the understanding of the environment. To date, there is no empirical evidence to support the notion that language preordains thought and perception. In fact, some discredit this extreme notion that

language *determines* thoughts and perceptions, but simultaneously hypothesizes that language instead, *influences* thoughts and perceptions (Hunt & Agnoli, 1991).

Gordon (2004) believed he demonstrated a "strong case for linguistic determinism" citing the Pirahã tribe, who reside in the Amazonia region of Brazil. This tribe has a language system to symbolize "roughly one," "roughly two," and "many." As suspected, members of the tribe ($N = 7$) were significantly limited by their inability to count items, especially when the task involved more than three units.

What if the moderated Whorphian hypothesis, where language influences thought and perceptions, were applied to the anthrozoological work? How has language affected the conceptualization of the work and subsequent interpretation of results? It seems plausible that word(s) could influence, bias, or even confound our hypothesis formulation, participant responses, and the interpretation of results. Some of these dilemmas may be amplified when chosen words are known to have diluted meanings and been contaminated with biases. Names, words, even symbols have the potential to encapsulate a range of meanings (Lawrence, 1989). For instance, dogs were believed to embody the devil (God spelled backwards) in seventeenth century English witchcraft (Leach, 1989). Even the rules of grammar stipulate that the relative pronoun "who" has exclusive application with people (Strumpf & Douglas, 1999) Does our socially constructed language around other species limit our ability to consider the range of possibilities in contributions and influences in these interspecies relationships? Are we so fearful of being anthropomorphic that we have become anthropodenial? De Waal (1997) coined the term anthropodenial to describe, "a blindness to the humanlike characteristics of other animals, or the animal-like characteristics of ourselves."

Of particular interest is how most scholarly work refers to members of other species as "animals." Use of this term "animal" seems to imply an accurate separation between humans and other species. Even the antiquated classification chart created by Carolus Linnaeus clearly shows this as a fundamental error (Jurmain et al., 2005). Contemporary biologists consider humans as animals as do geneticists, as they complete the sequencing the genome of the chimpanzee in order to have a reliable comparison with its human counterpart (Weissenbach, 2004). How conceivable is it that the anthrozoological studies are impaired by the segregation?

Another instance of language bias is the use of the word "pet" within the AVMA survey to identify the existence of members of other species within the household as it has the potential to influence how respondents complete this mailed questionnaire (American Veterinary Medical Association [AVMA], 1992, 1997, 2002). One such risk of bias is the social desirability effect. This bias occurs when an individual is motivated to respond in order to be viewed favorably or pleasing to the researcher or sponsoring organization (Rubin & Babbie, 2001). Another threat to this survey lies in its potential to discourage prospective respondents. It seems imaginable that the terms "pet" and "ownership" may be offensive to some recipients, but for different reasons. For those who do not consider members of other species as pets, companions, and especially family members, but rather expendable commodities, completing this survey would be pointless and amount to a waste of time. However, for another part of the population, for whom the term pet implies "ownership," this insinuation is considered philosophically erroneous and thus uninviting (Irvine, 2004). Interestingly, the AVMA's implied definition of pet is ownership. One could argue that using the word "pet" reflects the

public's language, especially if you take into account its repeated use in the literature, including the academic literature.

Are significant gains made by the thoughtful selection, consistent and judicious use of the written and/or spoken words that represent members of other species in a variety of contexts? Take for example the title of the AVMA's book, *U.S. Pet Ownership & Demographics Sourcebook.* Electing to use the word "pet" to define the mere presence of a member another species within or just outside a household does not warrant the original affectionate label reserved for the term "pet." Interpretations taken from these results may erroneously assume that each participating human considers the word referring to a member of another species as a pet, defined as, "specially cherished; for which one has a particular fondness or weakness" (OED, 1989).

When scale items include undefined language, which then requires the subjective interpretation of the participant, it limits our ability to accurately identify the measured construct. Additionally, when item content is not carefully considered it has the potential to invite speciesism. Speciesism in scales exists when the questions favor one species over another by excluding the possible range of interactions between humans a member of another species (Zasloff, 1996) Johnson et al. (1992) observed that when the language in the scales became more species-neutral between canines and felines, differences were undetectable between interspecies relationships. Furthermore, assuming that the nature of relationships with one species would be generalizable to all species violates a basic interpretative convention (Eddy, 2003).

The integrity of science requires diligent attention with its expressed language. As our understanding of interspecies relationships evolve, so must our language. How

different are we from Descartes when we use a term like 'animal' to exclude humans? Is it possible that when research interprets reality exclusively in anthropocentric terms, that it constitutes bias? If so, what role have they played in these investigations? Does the scholarly work perpetuate inaccurate, blinding, and imprecise language?   If so, what are the consequences? Commitment to standardization in the language and its definitions will likely invite meaningful communicative exchanges.

Emerging Themes

Trends refer to a "significant, enduring, and widespread development in knowledge about practice" (Reid, 2002, p. 1). Unquestionably, researchers are measuring some dimension(s) that provide evidence as to why humans voluntarily relate to members of another species. However, when an operational definition is not identified prior to data collection and then tested, the usefulness of the descriptive dimension (e.g., attachment, bond) will remain very limiting and ambiguous. The selected studies and a literature review also provide miniscule evidence that acknowledges a member of another species as contributing to the interspecies relationship.

A likely antecedent toward an operational definition of the human-canine relationship continuum will be the ability to articulate in measurable terms the humans experience of this relationship, commonly known now as attachment, commitment, bond, support, etc. The descriptor of this human experience will likely require a new word in order to separate this experience from human/object relationships. In view of this complexity, a clear enunciation of a comprehensive, bi-directional, bilingual, interspecies, interrelated and multi-dimensional relationship between a human and a canine is unreasonable to expect at this time. We simply do not know enough.

Furthermore, I would argue that our language at this time limits this conceptualization and therefore, meaningful exchanges. Until the canines' perspective is established and sensitively synthesized with the humans' perspective, we cannot responsibly claim to have defined, much less measured, the *human-animal bond* or any version thereof. Alternatively, we are left with the arduous task of considering and articulating the contributions(s) made by a member of another species as understood or perceived by its human companion.

The anthrozoological field is not alone in its effort to improve its language. In an effort to put this into perspective, consider this. The literature describing what eventually would be called *stress* began as early as the mid 1850's (McEwen, 2002; Schulkin, 2003). Well over a century later, debates continue as what to call this phenomenon (McEwen, 2002), and even its operational definition (Kahn, 1992). Is it any surprise that the anthrozoological field has yet to operationalize its terms, much less reached a consensus? Nevertheless, offering a rudimentary definition, as these and other researchers have, is courageous and provides a starting point.

Unfortunately, authors rarely express caution against generalizing their findings to under-represented or absent populations (Wilson & Barker, 2003). Since seven of the eight selected scales did not acquire their sample through probability sampling methods, broad and sweeping generalizations are inappropriate. In addition, studies that did not collect particular demographics (e.g., ethnicity) are unable to determine the applicability to such populations. Not controlling for a demographic variable makes it impossible to discern if that demographic is a confounding variable. In fact, studies rarely mention the possibility that demographic variables could be confounding variables (Heimlich, 2001).

Implications for Social Work

The social work profession is acknowledging and addressing issues surrounding interspecies interactions (Faver & Strand, 2003b; Netting et al., 1987; Netting, Wilson, & Fruge, 1988; Norris-Shortle, Young, & Williams, 1993; Sable, 1995). Integrating these interactions into practice (Burgon, 2003; Ceconi & Urdang, 1994; Granger & Carter, 1991; Mason & Hagan, 1999; Netting et al., 1984a; Netting, Wilson, & New, 1984b; Quackenbush & Glickman, 1984) and addressing concerns related to this relationship (Faver & Strand, 2003a; Goldmeier, 1986; Ryder & Romasco, 1980; Strand, 2004; Turner, 1997). The social work profession has much to offer and contribute to this evolving field of cross-species interactions and relationships.

Social workers using the ecological or person-in-environment theoretical framework have the advantage of considering and ideally engaging the individual's family, community, cultural and social environments to assist with intervention (Pardeck, 1996). Given the prevalence statistic that 58.3% of U.S. households live with a member of another species and most of those same households consider them consummate family members, social workers will inevitably encounter clients involved in interspecies relationships (AVMA, 2002).

A cardinal value of social work respects and recognizes the significance of each person's uniqueness and individuality (Strom-Gottfried, 2002). Examples of this uniqueness and individuality are present in life experiences, values, appearances, interests, motivations, and relationships. Regardless of the social worker's affinity, or lack thereof for the company of a member of another species, becoming acutely aware of the clients reality could make the difference between successful or failed goals. Social

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work educators emphasize the need for social workers to compartmentalize their own value and belief systems in order to attend to their client's worldview. Without this distinction, social workers could easily and perhaps unintentionally, perpetuate a client's fear or embarrassment. Take for instance the following example. A male client presented with what appears to be depressive symptoms; a thorough interview revealed an intense grief reaction following the recent death of his 18-year old cat companion. This client was too embarrassed to share this relationship experience on his own volition and without the social workers inquiry, this significant relationship would have remained unspoken. Without understanding the entire circumstances, the intervention delivered could be significantly different from the one warranted.

A standard, unapologetic question during the psychosocial interview should inquire about past and current interspecies relationships. The social worker familiar with the literature will recognize the unique needs of the clients who have cross-species relationships. Margolies (1999) describes how the death of a venerable companion can bring into consciousness unresolved, early maternal losses.

Learning about the maltreatment of other species in the home may also serve as an indicator for the presence of spousal abuse (Favor & Strand, 2003b), child abuse (Ascione, 1993), and a juvenile sexual offender (Fleming, Jory, & Burton, 2002). Knowing the evidentiary link between abuse among members of another species and domestic violence heightens the social worker's awareness to attend to the welfare of the species that is not human (Favor & Strand, 2003a).

A severely underserved population for clinical support can be found in this nation's humane shelters, "animal" control, veterinary medicine and similar non-profit

and for-profit organizations. At present, communities manage the overpopulation and homelessness of other domesticated species through euthanasia. Work expectations for one "euthanasia" technician can be to kill as many as 678 cats and dogs in one month (J. Meyer, Executive Director for the Greater Birmingham Humane Society, AL, personal communication, July 5, 2002). An informed social worker knows that the majority of volunteers or those who seek employment in these welfare organizations relate very well and care deeply about what some in society consider disposable. They also know about the enormous guilt associated with "euthanasia" (Frommer & Arluke, 1999), further demonstrating the impact one species can have on another, even when their interactions last only minutes.

Capitalizing on the strengths within these interspecies relationships may go untapped too. For instance, encouraging a withdrawn individual to walk their dog, or engage in some activity that involves a member of another species might be more inviting and realistic. Conversely, without sensitivity and inquiry, the social worker may be oblivious to the guilt the person would have in leaving their aging companion at home.

Even the social worker performing case management is confronted with the needs of clients who have interspecies relationships. Take for example, a hospitalized, 82 year old widow suffering from severe undernourishment and described as intermittently coherent, but in touch with reality when it came to Lacey, her companion dog. Because of the patient's amplifying concerns for the dog and the fact that the hospital social worker recognized that the "patient's fate was linked to, perhaps even determined by, the fate of the dog" the dog's welfare became an anomalous objective (Bikales, 1975, p. 151).

Social workers responding to a disaster or an emergency and are planning crisis interventions, should know that debilitating effects may result when responders have to kill, or witness the killing of thousands of other species for disaster management purposes (Hall, Ng, Ursano, Holloway, Fullerton, & Casper, 2004). Social workers involved with disaster preparedness and emergency response may focus special efforts on the outcomes of the following report. (Heath, Beck, Kass, & Glickman (2001a) indicated that humans who fail to evacuate with a member of another species increases: 1) as the number of other species present in the household increases, 2) when canines live outside, and 3) when households do not own a cat carrier. Other inhibitors to evacuating during a disaster include the logistics of how to transport, and those considered to have low "commitment" and "attachment" to their companions (Heath, Voeks, & Glickman, 2001b).

Social workers can also offer effective empirical knowledge and skills in the anthrozoological science. Introducing species into the therapeutic setting will inevitably raise questions about the mechanisms at work that influence outcomes among humans and a member of another species. When a specific clinical intervention is tested (e.g., presence or absence of a canine as the dependent variable), valid measures need to be available. Social workers who take a holistic view of humans have the advantage of contributing to directly to investigative inquiries of these interspecies relationships. Naturally, this holistic approach requires sensitivity to the issue of speciesism. As Wolf (2000) reminds us, "as social workers we are obliged to at least consider the moral, ethical, and practical implications of our treatment of species other than ourselves" (p. 92).

CHAPTER 4

METHODS AND PROCEDURES

Since words are always an abstract, approximate map of
reality, the verbal interpretations of a scientific experiment or
of a mystical insight are necessarily inaccurate and
incomplete. . . .the realization that all models and theories
are approximate is basic to modern scientific research. Thus
the aphorism of Einstein, 'As far as the laws of mathematics
refer to reality, they are not certain; and as far as they are
certain, they do not refer to reality.'"
(Capra, 1975, p. 41)

Purpose of the Study

The design of this study intended to test the previously presented notion of how

human language may influence thoughts and perceptions. More specifically, its purpose

was to investigate the extent to which the word "pet" provided valid results in the

Lexington Attachment to Pets Scale (LAPS) (Johnson et al., 1992) (see Appendix H).

Vocabularies evolve through time, creating unfortunate ambiguities and compromising

precise use; neologisms emerge while other words become obsolete. This is especially

applicable as an area of study advances its understanding, resulting in necessary changes

for a more exact vocabulary that eventually others adopt. Naturally, scale items would

need to parallel the linguistic evolution.

This study introduces an alternative to referring to a generic subject in a scale

item by inserting the identified canine's name as typed by the participant (see Appendix

L for the modified version of the LAPS). This approach intended to examine the degree

to which respondents differentiate between the word *pet* and their canine's name as a

means of referring to their canine within scale items. In order to test the hypotheses that

personalizing (i.e., using the respondent's canine's name) the referring term will produce

more valid responses of *pet attachment* (*sic*) in the LAPS than the indiscriminant term *pet*, the below research questions were used to direct the study.

1. Do the sample data fit the hypothesized measurement model? (see Appendix M) The hypothesized measurement model replicates the original author's structure.

2. If so, how do the LAPS: Original and Personalized data compare in their structure coefficients?

<div align="center">Methodology</div>

<div align="center">*Instrumentation and Study Design*</div>

The Lexington Attachment to Pets Scale (LAPS) (Johnson et al., 1992) was chosen for this study because it methodologically outperforms all related scales (i.e., used a random digit-dialing telephone survey, resulting in a representative sample in a Kentucky metropolitan area; scale with the highest *n*; randomized sequence of scale items to minimize order effects). Items for this scale were adapted (Stallones, Marx, Garrity, & Johnson, 1988; Stallones et al., 1990) and reviewed (Poresky et al., 1987; Templer et al., 1981; Wilson et al. 1987) from previous attachment (*sic*) scales. A unique 41-item Demographic Data Profile (see Appendix N) designed by this author, solicited information about the canine, the respondent, and the respondent's perception of the canine.

This quasi-experimental design required the features of an internet survey. This relatively new and growing data gathering resource has several advantages, but not without compromises. See Table 8 for a sampling of these benefits and limitations. At

Table 8

Sample Benefits and Restrictions of the Electronic Survey

Advantages	*Disadvantages*
Cost efficient*	Security (data loss, hacker)*
Time efficient*	Response rate unattainable*
Internet-user population vast & diverse*	Increase of drop-out rates*
Design flexibility**	Authenticity (unable to determine participant's credibility)**
Increased accuracy**	Response bias (participants self-selected)**
Decrease of data entry error**	Incentives devalued**
Enhanced presentation**	Confidentiality suspect**
Convenience (schedule coordination)**	Random sampling impossible***
Greater return versus paper surveys**	Privacy (IP address)***
Faster response rate***	Survey presentation different***
Ease of sending reminders***	Respondents computer skills vary***

*Hewson, Yule, Laurent, & Vogel, 2003
**Anderson & Kanuka, 2003
***Gunn, 2002

the heart of this study design was the critical feature of automatically embedding the name of a participant's canine's name into the LAPS items. The University of Tennessee server hosted this survey. The program used to create and collect the data was mrInterview^{TM}, a product of the SPSS Inc Dimensions^{TM} market research platform.

Simplicity, ease of navigation and comprehension guided the construction of this web-based survey. Keeping the presentation format simple (e.g., no graphics) allowed the survey more accessible to users with a slower speed internet access (e.g., dial-up). Grouping related questions on a page required fewer web pages, but intentionally kept at a minimum so not visually overwhelm the participants. In addition, the layout of the responses was design to be straightforward and intuitive. Four types of responses were used throughout the survey: 1) required participants to type text in open-ended questions, 2) used drop-down menus, 3) included radio buttons (for Likert scales), and 4) incorporated check boxes (for "select all that apply" questions).

In a continued effort for minimalism, two other elements were included on each web page. At the top of the webpage, a progress indicator provided the user an estimate of their progress through the survey, hoping to offer continued motivation toward completion. At the bottom of the webpage, two buttons (i.e., "previous" and "next") were necessary in order for the respondent to navigate through the survey by either returning to the previous page, or advancing to the next web page. This internet research also took advantage of the powerful versatility in computer-generated surveys by skipping questions and alerting users of missing answers.

Prior to the launch of this project, 15 people were hand chosen to complete the survey and provide feedback. Each person received an invitational correspondence

through electronic mail (e-mail) that included a link to the test survey. This preliminary

exercise resulted in text changes, identified typos, and integration of several suggestions.

The invitational e-mail (see Appendix O) soliciting participation for this study

included the survey's uniform resource locator (URL). Once the recipient directed their

internet browser to this URL, a Welcome page appeared (see Appendix P). The next two

web pages contained the Study Information Sheet (see Appendix Q). This was selected

over an Informed Consent because participation was anonymous and required no

signature. Submitting data constituted consent. The first five or six questions of the

Demographic Data Profile were presented before the LAPS in an effort to screen out

ineligible participants and obtain the text that would be used in remaining questions.

Volunteer participants were required to meet all the following criteria, asked in the first

four questions:

- 18 years or older;

- Lives in one of the fifty states of the U.S.A. or, Washington, D.C.; and

- Had at least one dog who lives inside, or outside, their home and for
  whom they are responsible at least some of the time.

Then, participants were asked to type in the name of their identified canine (question 5).

In the event that their identified dog had no name, (i.e., participant selected the option,

"My dog has no name") they were directed to question 6 that asks how, in one to two

words, they refer to this dog. Again, the participant was asked to type in this word(s).

For households that had multiple dogs, participants were asked to identify one and

instructed to keep this dog in mind as they answered the remaining questions. The sixth

question was reserved only for those who indicated that their canine had no name.

Should a participant choose "Decline to answer" in either question 5 or 6, they were automatically exited out of the survey. Once a respondent answered one of the above six questions indicating their ineligibility, they were directed to the Ineligible page (see Appendix R). This page thanks them for their interest and asks them to forward the survey link to others that do meet the criteria.

Respondents who typed in the name of their canine (question 5) were systematically alternated to either the LAPS: Original or the LAPS: Personalized survey. Those who indicated their dog had no name and typed in the word or words used to refer to this dog were always directed to the LAPS: Original. Anticipating an inconsequential number of respondents whose dog had no name, this decision was based on the premise that if a person had not named their dog, a personalized survey was essentially inappropriate.

After respondents responded to either the LAPS: Original or Personalize version, a series of specific questions about this dog were presented, embedding the text the respondent typed in either question 5 or 6. Inquiries about the respondent and their household follow the canine questions. The last question solicits the participant's thoughts, comments, and/or feedback about this survey and/or its topic in a qualitative form. The last webpage requested e-mail addresses for those who wanted to enter the drawing for one of four $25.00 PetSmart gift cards (see Appendix S).

Participants and Sampling Methods

A snowball sampling method (McCall & Simmons, 1969), by way of e-mail invited the self-selected participants. This author utilized professional and personal e-mail addresses to solicit participants, totaling 391 contacts. In addition, five listservs,

with a membership totaling a minimum of 506, were asked to post or distribute the invitational e-mail, along with six organizations. This author received 100 returned e-mails for various reasons (e.g., recipient's mail system turned off, destination mail system not currently running, mailbox unavailable, user unknown). The text of this e-mail invited contacts to participate and/or forward their invitation to their own professional and personal contacts. The date, which concluded the month long data collection, was included to encourage immediate participation and forwarding of the invitation. In order to increase the response rate, four PetSmart gift cards incentives were given away in a random drawing at the conclusion of data collection.

Procedures

Definition of Terms

For purposes of this study, the following terms are operationally defined:

Pet: refers to a canine that lives inside, or outside, the participant's home and for whom they are responsible at least some of the time. For participants who report having multiple dogs, pet refers to a canine to whom the participant has chosen, without any qualifier.

Pet attachment: the Lexington Attachment to Pets Scale (LAPS) is used in this study and so the definition is tailored to this instrument. Johnson et al. (1992) report that the LAPS measures "emotional attachment" (p. 160), further explaining that the LAPS "cover the range of affective ties that pet owners feel for their animals" (p. 163). The results from the LAPS produced these subscales, which the authors surmised represented components of emotional attachment to either dogs or cats: "general attachment," "people substituting", and "animal rights/animal welfare." This author suggests that the LAPS

not only solicits for the human's affective perspective, but also cognitive and intuitive

assessments, along with items that address interactions with or about a member of

another species. Therefore, the conceptual definition for pet attachment in this study

refers to a *limited* range of interactions, cognitive, affective, and intuitive perceptions that

participants report experiencing with or about a canine that lives inside, or outside, their

home and for whom they are responsible.

Confidentiality and Storage

Only this author, dissertation committee members, and statistical consultants had

access to the survey data. In keeping with the UT Office of Research's standards of data

collection and storage, this author will keep the collected data for no less than 3 years.

Statistical Analysis

Data entry was not necessary because mrInterview^{TM}, which collected the

electronic data, seamlessly downloads data into the SPSS program. All analyses used

SPSS 15.0 for Windows (2006) and its accompanying structural equation modeling

(SEM) program, Analysis of MOment Structures (AMOS) 7.0. AMOS is required to

address the research question for the hypothesized model and structure coefficients. See

Appendix M for the SEM model.

Institutional Review Board Approval

The University of Tennessee Institutional Review Board approved the protocol

and measurement package for this research in April 2007.

CHAPTER 5

RESULTS

*The extraordinary intricacy of all the factors to be taken
into consideration leaves only one way of presenting them
open to us. We must select first one and then another
point of view, and follow it up through the material as
long as the application of it seems to yield results.
(Freud, 1915, as cited in Bowlby, 1982, p.3)*

Data collection began on Sunday, April 8, 2007 and ended on Thursday, May 10,

2007. During the first five days, 5,314 people directed their browser to this study on the

UT server. Of these, 1,260 (24%) closed their browser before reaching the end of the

survey, designating them incomplete surveys. When the UT server stopped (i.e.,

rebooted), it prevented 11 (.2%) respondents from completing this survey. The survey

program considered 4,043 respondents (76%) as having completed the survey. This

simply means they progressed through the entire survey and reached the last page, thus

leading them to be marked as completed. This designation reflects no real assessment of

the participant's responses.

Incomplete Surveys

Examining the incomplete surveys ($n = 1,260$) revealed 980 cases where the

potential respondent closed their browser before submitting their age, which was the very

first question. Fifteen people submitted their age and then quit. An additional sixteen

went as far as to submit a response to the second question. Another forty-one indicated

the number of dogs inside or outside their home and then stopped. Eight additional

respondents provided the word(s) used to refer to their dog and then quit before being

directed to the original Lexington Attachment to Pets Scale (LAPS) (Johnson et al.,

1992). A missing value analysis was conducted on the remaining 200 cases, with regard

to the LAPS items, with results shown in Table 9. All these incomplete surveys ($n =$

1,260) were deleted before the final analysis.

Additional Case Deletions

Additional cases were deleted from the dataset that were marked as completed

surveys prior to the final analysis. After reviewing the submitted canine names or

references, it appeared that some respondents typed in the name of more than one dog,

bringing into question the requirement that they have one particular dog in mind as they

responded to the remaining questions. This resulted in 73 case deletions (2% of 4,043).

The structural equation modeling (SEM) analysis required that items analyzed

have no missing values. A listwise deletion of 267 (7% of 4,043) cases resolved the issue

of missing values. A missing value analysis indicated that 52 respondents responding to

the Original survey declined to answer all 23-items, while there were none in the

Personalized group. Curiously enough, the item with the highest number of "declined to

answer" responses was the question, "I am not very attached to my pet/{canines name}."

Table 9

Responses to LAPS items from the Designated Incomplete Surveys

	LAPS: Original (n =110)	LAPS: Personalized (n =90)
Did not submit any responses	22	21
Submitted initial 6 responses	13	15
Submitted initial 12 responses	21	10
Submitted initial 18 responses	9	7
Submitted entire LAPS	45	37

The Original group had 49 additional participants who declined to indicate their level of agreeableness, while the Personalized group had 37. Results reported hereafter are based on an overall sample size of 3,703.

<p align="center">Characteristics of Sample</p>

Respondents who completed the survey ($N = 3,703$) were logged onto the survey server from 4 to 1,026 minutes (approximately 17 hours). The average time to complete the survey was 15 minutes ($SD = 30$), while the median was 11 minutes, and the mode was 9 minutes.

<p align="center">*Humans*</p>

Of the 3,703 respondents, 1,854 (50%) responded to the LAPS Original scale, while 1,849 (50%) submitted responses to the LAPS Personalized version. The mean age for the Original group and Personalized group were virtually the same ($M = 44$, $SD = 12$, *range* 18-83; $M = 44.5$, $SD = 12$, *range* 18-82, respectively). Table 10 provides an overview of gender, education, marital status, and ethnicity by each group and the sample's total. For Tables 10 through 17, please note that all data are based solely on valid responses; that is, missing data are excluded. This accounts for the variation in the presented n values. Percentages are rounded, therefore they may fail to equal, or may exceed, 100%.

Turning now to the composition of household occupants, most of the participants indicated that no one under 17 (78%) and over 66 (92%) lived in the house. For the in between age category of 18 through 65, 58% of respondents reported 2 adults living in the household. In this question about the number of household members, respondents

<p align="center">90</p>

Table 10

Human Gender, Education, Marital Status, and Ethnicity Summary

Characteristic	Original	Personalized	Total
	n (group %)	*n* (group %)	*n* (sample %)
Gender			
Male	209 (11.3%)	242 (13.1%)	451 (12.2%)
Female	1643 (88.6%)	1604 (86.8%)	3247 (87.7%)
Total			3698 (99.9%)
Education			
Some HS	9 (.5%)	9 (.5%)	18 (.5%)
HS grad or equiv	116 (6.2%)	119 (6.4%)	235 (6.3%)
College, no degree	408 (22.0%)	371 (20.1%)	779 (21.0%)
AA/AS	145 (7.8%)	161 (8.7%)	306 (8.3%)
BA/BS	629 (33.9%)	613 (33.2%)	1242 (33.5%)
MA/MS	392 (21.1%)	393 (21.2%)	785 (21.2%)
Doctorate	146 (7.9%)	172 (9.3%)	318 (8.6%)
Total			3683 (99.4%)
Marital Status			
Single	330 (17.8%)	312 (16.9%)	642 (17.3%)
Married	1069 (57.6%)	1112 (60.1%)	2181 (58.9%)
Separated	14 (.8%)	14 (.8%)	28 (.8%)
Widowed	36 (1.9%)	32 (1.7%)	68 (1.8%)
Divorced	162 (8.7%)	169 (9.1%)	331 (8.9%)
Live with SO	216 (11.6%)	183 (9.9%)	399 (10.8%)
Other	15 (.8%)	19 (1.0%)	34 (.9%)
Total			3683 (99.4%)
Ethnicity			
African American/ Black	15 (.8%)	10 (.5%)	25 (.7%)
American Indian/ Alaska Native	6 (.3%)	5 (.3%)	11 (.3%)
Asian	9 (.5%)	12 (.6%)	21 (.6%)
Asian Indian	1 (.0%)	4 (.2%)	5 (.1%)
Hispanic/Latino	28 (1.5%)	21 (1.1%)	49 (1.3%)
Native Hawaiian/ Pacific Islander	2 (.1%)	5 (.3%)	7 (.2%)
White, Non Hispanic	1689 (91.1%)	1700 (91.9%)	3389 (91.5%)
Multi-ethnic	33 (1.8%)	37 (2.0%)	70 (1.9%)
Other	28 (1.5%)	27 (1.5%)	55 (1.5%)
Total			3632 (98.1%)

had six categories to choose from, which started with 0 and ended with 5+. In addition,

respondents were asked as a parent or legal guardian, how many of their children lived in

and away from their home. The response set established for household occupants

described above was repeated with the addition of a "not applicable" category. The vast

majority indicated that none of their children lived in the home (73%) and outside their

home (71%). For a complete breakdown of each response category by each group, and

the sample totals, see Appendix T.

Table 11 displays each group's community size, income and a national regional

distribution, along with the sample totals. The two states that had the greatest

representation were Tennessee (Original $n = 256$, Personalized $n = 275$) and California

(Original $n = 143$, Personalized $n = 143$). The Original group had the fewest participants

in Montana ($n = 1$), North Dakota ($n = 2$), and South Dakota ($n = 2$). The Personalized

group lacked participation from North Dakota residents and had only one from South

Dakota. Appendix U contains the state distribution for each group and sample totals.

Nearly 95% of the respondents indicated their religious and/or spiritual identity

(see Table 12 for these results). Additional questions were asked of all respondents who

indicated an organized religion identity regarding the extent of their strict interpretation

of their religion and the extent of their religious practice; see Appendix V for this

information. To review the listing and/or definition of each category see question 31 in

Appendix N.

Table 11

Household Income and Geographic Summary

Characteristic	*Original*	*Personalized*	*Total*
	n (group %)	*n* (group %)	*n* (sample %)
Community Population			
2,499 or less	157 (8.5%)	141 (7.6%)	298 (8.0%)
2,500 – 50,000	700 (37.8%)	719 (38.9%)	1419 (38.3%)
50,001 or more	978 (52.8%)	974 (52.7%)	1952 (52.7%)
Total			3669
Household Income			
Less than 10,000	20 (1.1%)	8 (.4%)	28 (.8%)
10,000 – 14,999	10 (.5%)	15 (.8%)	25 (.7%)
15,000 – 19,999	12 (.6%)	23 (1.2%)	35 (.9%)
20,000 – 24,999	35 (1.9%)	35 (1.9%)	70 (1.9%)
25,000 – 29,999	42 (2.3%)	48 (2.6%)	90 (2.4%)
30,000 – 34,999	52 (2.8%)	54 (2.9%)	106 (2.9%)
35,000 – 39,999	69 (3.7%)	70 (3.8%)	139 (3.8%)
40,000 – 44,999	68 (3.7%)	70 (3.8%)	138 (3.7%)
45,000 – 49,999	83 (4.5%)	64 (3.5%)	147 (4.0%)
50,000 – 59,999	152 (8.2%)	163 (8.8%)	315 (8.5%)
60,000 – 74,999	227 (12.2%)	201 (10.9%)	428 (11.6%)
75,000 – 99,999	296 (16.0%)	329 (17.8%)	625 (16.9%)
100,000 – 124,999	211 (11.4%)	227 (12.3%)	438 (11.8%)
125,000 – 149,999	100 (5.4%)	101 (5.5%)	201 (5.4%)
150,000 – 199,999	112 (6.0%)	110 (5.9%)	222 (6.0%)
200,000 or more	92 (5.0%)	86 (4.6%)	178 (4.8%)
Total			3185
National Regions			
Northeast	267 (14.4%)	286 (15.5%)	553 (14.9%)
Midwest	297 (16.0%)	300 (16.2%)	597 (16.1%)
South	853 (46.0%)	865 (46.8%)	1718 (46.4%)
West	437 (23.6%)	398 (21.5%)	835 (22.5%)
Total			3703

Table 12

Religious/Spiritual Identity Summary

Characteristic	Original	Personalized	Total
	n (group %)	*n* (group %)	*n* (sample %)
Agnostism	190 (10.2%)	208 (11.2%)	398 (10.7%)
Atheism	108 (5.8%)	86 (4.6%)	194 (5.2%)
Buddhism	14 (.8%)	15 (.8%)	29 (.8%)
Christianity	990 (53.4%)	1015 (54.9%)	2005 (54.1%)
Hinduism	-	2 (.1%)	2 (.0%)
Islam	-	2 (.1%)	2 (.0%)
Judaism	49 (2.6%)	54 (2.9%)	103 (2.8%)
Spiritual	335 (18.1%)	331 (17.9%)	666 (18.0%)
Other:	53 (2.8%)	62 (3.4%)	115 (3.1%)
Total			3514

Canines

The canine name most frequently used was Lucy (*n* = 34), followed by Bailey (*n* = 32) and Max (*n* = 32). Fifty-four participants indicated that their dog had no name but did type in a word or words they use to refer to the identified dog. The majority of canines referred to in this study were female, spayed/neutered, and a pure breed. Table 13 has these categories broken down by each sample group (Original *n* = 1854; Personalized *n* = 1849) and its total (*N* = 3703).

The ages of the selected canine and the total number of canines reported to live inside the house and outside the house are shown in Table 14. The *modal* number of canines living inside the house for both groups is 1, while the *median* was 2. The *mode* and *median* number for those living outside the house in the entire sample was 0. To determine the age of the dog, participants were first asked to indicate if their dog was 12 months or younger or 13 months or older. Respondents indicating 12 months or younger were asked to indicate the number of months for their dog's age, as opposed to those

Table 13

Canine Gender, Reproductive Status and Breed Summary

Characteristic	*Original*	*Personalized*	*Total*
	n (group %)	*n* (group %)	*n* (sample %)
Gender			
Male	926 (49.9%)	892 (48.2%)	1818 (49.1%)
Female	927 (50.0%)	954 (51.6%)	1881 (50.8%)
Total			3699 (99.9%)
Neutered/Spayed			
Yes	1607 (86.7%)	1603 (86.7%)	3210 (86.7%)
No	244 (13.1%)	244 (13.2%)	488 (13.2%)
Total			3698 (99.9%)
Breed			
Pure	1254 (67.6%)	1253 (67.8%)	2507 (67.7%)
Mixed	579 (31.2%)	582 (31.5%)	1161 (31.4%)
Unknown	13 (.7%)	9 (.5%)	22 (.6%)
Total			3690 (99.7%)

Table 14

Canine Age and Number of Canines In and Outside of Household

Characteristic	*Original*			*Personalized*			*Total*		
	n	*Range*	*M (SD)*	*n*	*Range*	*M (SD)*	*n*	*Range*	*M (SD)*
Canine age									
Months	87	0-12	8.1 (3.0)	101	2-12	8.3 (3.1)	188	0-12	8.2 (3.0)
Years	1763	1-30	6.3 (3.7)	1745	1-30	6.2 (3.7)	3508	1-30	6.2 (3.7)
Total									
No. of canines									
Inside	1854	0-25	2.3 (2.0)	1849	0-25	2.2 (1.8)	3703	0-25	2.3 (1.9)
Outside	1854	0-40	.3 (1.6)	1849	0-120	.4 (3.1)	3703	0-120	.3 (2.5)
Total									

indicating 13 months or older who were asked to indicate their dog's age in years. Table 15 displays where these canines spend *most* of their days, where they *usually* sleep at night, and if the dog has a choice of where s/he sleeps.

Human-Canine Interactions

Respondents were almost 8 years old ($M = 7.8$, $SD = 7.2$) when they *first* remember caring about a dog in their family. The *modal* and *median* ages for both groups was 5. An overwhelming majority of respondents indicated that their overall experiences with dogs were favorable. Table 16 provides these overall experiences, how much time they were responsible for taking care of the identified canine, and how long they have lived with this dog by group and the sample totals.

Table 17 displays the extent to which the identified canine followed the respondent's directions, along with their disciplinary methods with this dog, and their frequency for presenting this dog for veterinary care. Note that the questions for disciplinary methods and frequency of veterinary care were constructed so that respondents could "select all that apply," so this accounts for the absence of group and sample totals.

Structural Equation Modeling Analysis

Structural equation modeling (SEM) allows the researcher to examine data in a deductive process, including the testing of hypothesized measurement models through the use of a confirmatory factor analysis. Based on a theoretical framework and/or previous empirical work, the researcher creates a hypothesized measurement model, specifying the structure of the observed variables and their corresponding relationship to latent constructs (Byrne, 2001). One of the features of SEM, of which confirmatory factor

Table 15

Canine Day and Sleep Location Summary

Characteristic	*Original*	*Personalized*	*Total*
	n (group %)	*n* (group %)	*n* (sample %)
Spend day - Outside			
On chain/trolley	5 (.3%)	4 (.2%)	9 (.2%)
In fenced area	112 (6.0%)	102 (5.5%)	214 (5.8%)
Roaming freely	25 (1.3%)	21 (1.1%)	46 (1.2%)
Spend day - Inside			
Crated	71 (3.8%)	74 (4.0%)	145 (3.9%)
Restricted access	360 (19.4%)	325 (17.6%)	685 (18.5%)
Roaming freely	1043 (56.2%)	1104 (59.7%)	2147 (58.0%)
Other	238 (12.8%)	219 (11.8%)	457 (12.3%)
Total			3703
Sleep outside			
Of house	38 (2.0%)	30 (1.6%)	68 (1.8%)
Sleep inside			
Not in bedroom	292 (15.8%)	306 (16.5%)	598 (16.1%)
In bedroom, not bed	609 (32.8%)	655 (35.4%)	1264 (34.1%)
In my bed	748 (40.3%)	693 (37.5%)	1441 (38.9%)
Other	167 (9.0%)	165 (8.9%)	332 (9.0%)
Total			3703
Choice of sleep area			
By his/her choice	1449 (78.2%)	1421 (76.8%)	2870 (77.5%)
Not his/her choice	397 (21.4%)	423 (22.9%)	820 (22.1%)
Total			3690

Table 16

Overall Dog Experiences, Time Responsible for Identified Canine, and Cohabitation

Characteristic	Original	Personalized	Total
	n (group %)	*n* (group %)	*n* (sample %)
Overall experience			
Unfavorable	1 (.0%)	2 (.1%)	3 (.1%)
Neutral	9 (.5%)	13 (.7%)	22 (.6%)
Favorable	1844 (99.5%)	1834 (99.2%)	3678 (99.3%)
Total			3703 (100%)
Responsible time for dog			
25%	55 (3.0%)	66 (3.6%)	121 (3.3%)
50%	403 (21.7%)	420 (22.7%)	823 (22.2%)
75%	638 (34.4%)	626 (33.9%)	1264 (34.1%)
100%	755 (40.7%)	735 (39.8%)	1490 (40.2%)
Total			3698 (99.8%)
Length of Cohabitation			
< 1 year	157 (8.5%)	169 (9.1%)	326 (8.8%)
1 year	148 (8.0%)	157 (8.5%)	305 (8.2%)
2-5 years	790 (42.6%)	810 (43.8%)	1600 (43.2%)
6-10 years	495 (26.7%)	500 (27.0%)	995 (26.9%)
10 or more years	262 (14.1%)	212 (11.5%)	474 (12.8%)
Total			3700 (99.9%)

Table 17

Extent Canine follows Directions, Discipline Methods Used, and Veterinary Care

Characteristic	Original	Personalized	Total
	n (group %)	*n* (group %)	*n* (sample %)
Following Directions			
Ignores	19 (1.0%)	18 (1.0%)	37 (1.0%)
Follows	1417 (76.4%)	1454 (78.6%)	2871 (77.5%)
Random	74 (4.0%)	60 (3.2%)	134 (3.6%)
Depends	342 (18.4%)	317 (17.1%)	659 (17.8%)
Don't know	1 (.0%)	-	1 (.0%)
Total			3702
Discipline Methods			
Swat/Strike	211 (11.4%)	214 (11.6%)	425 (11.5%)
Voice	1759 (94.9%)	1764 (95.4%)	3523 (95.1%)
Nonverbals	1057 (57.0%)	1079 (58.4%)	2136 (57.7%)
Confine	450 (24.3%)	471 (25.5%)	921 (24.9%)
Rewards	1448 (78.1%)	1430 (77.3%)	2878 (77.7%)
Ignore	549 (29.6%)	559 (30.2%)	1108 (29.9%)
Other	142 (7.7%)	178 (9.6%)	320 (8.6%)
No discipline	24 (1.3%)	26 (1.4%)	50 (1.4%)
Frequency of Vet Care			
Vaccines/ Concerns	1722 (92.9%)	1721 (93.1%)	3443 (93.0%)
Routine vaccines	66 (3.6%)	67 (3.6%)	133 (3.6%)
Only if necessary	84 (4.5%)	75 (4.0%)	159 (4.3%)
Never	4 (.2%)	1 (.0%)	5 (.1%)
Decline to answer	6 (.3%)	8 (.4%)	14 (.4%)

analysis is a special case, is that it enables the researcher to assess the goodness-of-fit

between the hypothesized measurement model and the actual data (Byrne, 2001;

Schumacker & Lomax 2004). Evaluating this goodness-of-fit occurs through both

statistical tests and estimates. The plausibility of the hypothesized relations among the

structured variables are based on the sample data by way of goodness-of-fit indices

(Byrne, 2001). Foremost, as in this research project, the researcher must first ask the

question, "Do the data fit the hypothesized model?" If the result yields supporting

evidence, through the overall chi-square and varies fit indices, then the hypothesized

measurement model of the observed and latent variables is considered plausible.

Consequently, the null-hypothesis is not rejected, which is in contrast with conventional

statistics. If, however, the results imply a lack of fit, one step would be to conduct a

specification search. The hypothesized model is respecified in order to improve the fit so

long as it also provides practical and substantive theoretical meaning (Schumacker &

Lomax, 2004).

Unlike any other empirical study investigating relationships humans have with a

member of another species, this study sought to reject, or not reject, the hypothesized

measurement model of the "pet attachment" (*sic*) subscales/factors. The hypothesized

measurement model in this project (see Appendix M) is an extension of the previous

work completed by the original authors of the LAPS (Johnson et al., 1992). Johnson et

al. (1992) used a principal-components analysis to study the factor structure of the LAPS

with their collected data. In doing so, they produced what appeared to be three

factors/latent-constructs: general attachment, people substituting, and animal

rights/animal welfare (see Appendix H).

Prior to the analysis, all LAPS items were examined through SPSS Explore. The SEM literature suggests eliminating items that violate the normality assumption with a skewness parameter greater then 1 (Hair, Black, Babin, Anderson, & Tatham, 2006; Huck, 2008), 2 (Meyers, Gamst, & Guarino, 2006), or 3 (Kline 2005). Splitting the difference among these recommendations, five of the items violated this assumption of normality because of their extreme negative skewness and deleted from any further analyses. See Table 18 for the identified items and their corresponding skewness and kurtosis values. Appendix H contains the Original LAPS survey, while the Personalized LAPS survey is in Appendix L.

Table 18

LAPS Items and their Corresponding Skewness and Kurtosis

LAPS Subscales		*Skewness*	*Kurtosis*
General Attachment			
	V	-2.902	9.515
	S	-2.432	5.412
	R	-2.739	8.136
	U	-4.339	18.820
Animal Rights/Welfare			
	T	-3.614	15.644

Confirmatory Factor Analysis

Finally, a multiple-groups confirmatory factor analysis, using maximum likelihood (ML) estimation, was conducted to test the hypothesized factor structures in the specified measurement model. See Appendix W for the modified SEM model. Given the amount of skewness in the majority of the remaining items (*range* -.339 through -1.825), the ML estimation method was used since research has suggested that it is robust to violations of the assumption of multivariate normality (Olsson, Foss, Troye, & Howell, 2000).

Evaluation of the hypothesized measurement model followed two steps. First, departure of the data from the specified model was tested for significance by using a chi-square test (Joreskog & Sorbom, 1989). Second, the goodness-of-fit between the data and the specified measurement model was estimated by employing the Comparative Fit Index (CFI) (Bentler, 1990), the Tucker- Lewis Index (TLI) (Bentler & Bonett, 1980), and the Root Mean Square Error of Approximation (RMSEA) (Browne & Cudeck, 1993), as recommended by Schumacker & Lomax (2004). The chi-square statistic (χ^2) is the only test of statistical significance. A perfect fitting model, according to the chi-square, will produce a chi-square value of zero (Schumacker & Lomax, 2004). However, because of the known problems associated with this test in large sample sizes and the central χ^2 distributions, additional fit indices have been developed (Byrne, 2001; Schumacker & Lomax, 2004). The CFI and TLI have values ranging from zero to 1.00 (Byrne, 2001). Hu & Bentler (1999) suggested a revised cut-off value for the CFI close to .95 for a "well-fitting model." Values close to .95 from the TLI also reflect a good model-data fit (Schumacker & Lomax, 2004). Browne & Cudeck (1993) purport that

RMSEA values of less than or equal to a .05 are indicative of a good model-data fit, while MacCallum, Browne, & Sugawara (1996) recommend values ranging from .08 to .10 as values indicative of an adequate fit, and values above .10 suggestive of a poor fit. Hu & Bentler (1999) offer a value of .06 for the RMSEA as a good fit.

The tested model in this project, where a three-factor structure was hypothesized, generated a χ^2 value of 4130.242, with 264 degrees of freedom and a probability of less than .001 ($p < .001$), suggestive of a lack of fit. This sample's data generated a χ^2 that indicated that it is unlikely that the hypothesized measurement model is adequate and should be rejected. Said another way, the model implied population variance-covariance matrix was not consistent with the sample variance-covariance matrix. However, before dismissing the hypothesized measurement model, consideration of the goodness-of-fit indices was necessary. Comparing the CFI (.95), TLI (.95) and RMSEA (<.05) cut off values with the results from this analysis suggested, again, an inadequate fit. Table 19 summarizes the chi-square values, degrees of freedom, and the goodness of fit indices (CFI, TLI, and the RMSEA) for the SEM analysis. Thus, these results imply that the hypothesized measurement model was not consistent with the data. Unfortunately, these results precluded specific tests of differential validity of the differently worded LAPS items.

Table 19

Goodness-of-Fit Indicators of the Hypothesized Measurement Model

Model	χ^2	*df*	*CFI*	*TLI*	*RMSEA*
Null	4130.242*	264	.862	.840	.063

* p < .001.

Table 20 displays the variance-covariance matrix of observed item scores, along with the item means, of the LAPS: Original group, while Table 21 contains the same information but for the LAPS: Personalized group.

Crosstabs Analysis

Since the SEM results prohibited further analysis of item functioning, an alternate but less sophisticated method was selected in an effort to identify differences in how the two group's responded to the differently worded items. This analysis made use of the SPSS crosstabs analysis procedure. This procedure allowed an examination of how items may be functioning differently between the two groups, within the same population. As reported earlier, the alternative assignment of participants appeared to produce two statistically equivalent groups, as evidenced by the collected human and canine demographics.

The hypothesis in this analysis shared the same supposition as in the previous SEM analysis. That is, the two groups are equivalent, items will function differently between the two groups, and that there should be differences in item responses that should exceed that expected by chance. The singular limiting feature of this analysis, however, within the context of this research is the inability to determine which item version is functioning in a more valid manner.

In an effort to control for overall Type I error, a critical alpha level of .002 was set. Given 23 tests of statistical significance of LAPS items, this critical alpha level gave an overall Type I error rate of less than .05 $[1 - (1-.002)^{23} = .045]$. Of the 23 statistical tests of the LAPS items, 8 had a Pearson Chi-square statistic with a p-value less than the

Table 20

Inter-Item Variance-Covariance Matrix of Original Items and their Means

Item	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
A	.904																						
B	.421	1.040																					
C	.489	.465	.957																				
D	.585	.500	.543	.931																			
E	.322	.313	.337	.320	.675																		
F	.506	.459	.440	.563	.357	.928																	
G	.205	.232	.231	.217	.183	.207	.582																
H	.346	.308	.412	.364	.281	.314	.196	.717															
I	.175	.268	.212	.265	.168	.366	.157	.131	.691														
J	.168	.254	.202	.230	.154	.229	.109	.145	.182	.420													
K	.177	.202	.190	.187	.186	.177	.256	.180	.128	.114	.359												
L	.303	.406	.384	.387	.225	.388	.186	.248	.303	.283	.177	.701											
M	.144	.154	.138	.173	.139	.146	.114	.129	.111	.105	.111	.118	.254										
N	.278	.237	.415	.322	.207	.268	.164	.258	.149	.143	.145	.221	.128	.530									
O	.194	.204	.198	.235	.156	.189	.135	.182	.108	.118	.123	.178	.127	.160	.263								
P	.235	.196	.244	.252	.160	.191	.137	.217	.107	.104	.122	.163	.115	.203	.178	.291							
Q	.127	.142	.132	.150	.101	.113	.127	.121	.070	.088	.109	.108	.094	.096	.130	.127	.256						
R	.102	.113	.104	.129	.090	.107	.092	.104	.068	.067	.088	.089	.079	.084	.112	.101	.106	.134					
S	.092	.098	.093	.105	.087	.095	.092	.097	.067	.060	.081	.088	.079	.066	.088	.091	.082	.080	.127				
T	.101	.097	.107	.115	.097	.101	.072	.122	.064	.055	.076	.086	.065	.092	.080	.092	.063	.062	.061	.116			
U	.077	.079	.048	.070	.054	.056	.072	.091	.020	.029	.056	.040	.045	.038	.068	.068	.051	.056	.053	.047	.281		
V	.093	.089	.088	.102	.091	.092	.093	.109	.059	.051	.085	.072	.083	.071	.082	.085	.081	.072	.076	.060	.048	.121	
W	.229	.239	.235	.303	.164	.254	.142	.209	.149	.113	.122	.229	.110	.171	.150	.148	.104	.095	.087	.091	.055	.099	.347
Mean	2.83	2.78	2.79	2.97	3.31	2.99	3.40	3.43	3.17	3.50	3.63	3.05	3.70	3.49	3.71	3.70	3.71	3.86	3.87	3.89	3.86	3.88	3.68

Table 21

Inter-Item Variance-Covariance Matrix of Personalized Items and their Means

Item	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
A	.899																						
B	.435	1.116																					
C	.505	.493	1.031																				
D	.596	.569	.593	1.017																			
E	.316	.339	.357	.347	.762																		
F	.530	.459	.476	.595	.402	1.012																	
G	.187	.255	.245	.234	.207	.195	.609																
H	.319	.318	.416	.362	.275	.311	.175	.736															
I	.209	.301	.252	.306	.213	.415	.177	.159	.697														
J	.194	.275	.235	.275	.206	.255	.129	.170	.207	.495													
K	.192	.213	.206	.237	.204	.194	.274	.161	.145	.145	.402												
L	.325	.467	.441	.451	.311	.453	.201	.289	.321	.350	.202	.819											
M	.175	.205	.186	.209	.176	.178	.113	.154	.127	.132	.117	.185	.334										
N	.316	.300	.494	.374	.249	.300	.170	.321	.206	.187	.146	.310	.169	.638									
O	.225	.256	.253	.308	.195	.229	.146	.220	.148	.175	.144	.266	.158	.229	.363								
P	.243	.235	.284	.292	.202	.232	.148	.256	.154	.147	.140	.213	.131	.240	.219	.347							
Q	.140	.149	.132	.178	.088	.116	.108	.128	.049	.098	.123	.120	.101	.091	.138	.134	.306						
R	.102	.115	.101	.135	.084	.109	.072	.106	.072	.075	.084	.103	.087	.088	.110	.106	.109	.146					
S	.105	.111	.106	.121	.090	.104	.098	.099	.075	.080	.092	.099	.092	.085	.107	.105	.088	.083	.151				
T	.077	.082	.089	.089	.067	.074	.070	.091	.053	.062	.060	.067	.057	.087	.077	.085	.055	.059	.067	.093			
U	.046	.053	.048	.070	.058	.052	.040	.073	.040	.045	.045	.051	.048	.053	.060	.066	.052	.049	.040	.035	.288		
V	.109	.110	.100	.123	.090	.106	.079	.113	.073	.080	.075	.094	.102	.083	.110	.105	.085	.087	.098	.065	.047	.150	
W	.248	.299	.283	.352	.197	.297	.128	.239	.205	.181	.143	.324	.133	.223	.200	.187	.098	.096	.092	.079	.049	.103	.451
Mean	2.72	2.64	2.73	2.78	3.19	2.87	3.42	3.40	3.16	3.47	3.58	2.94	3.60	3.35	3.62	3.68	3.68	3.86	3.84	3.91	3.86	3.86	3.60

critical value of .002. A Z-test for the equality between two proportions (binomial

distribution) formula was then calculated using the formula,

$$Z = \frac{(p_1 - p_2)}{\left\{P(1-P)\left(\dfrac{1}{n_1} + \dfrac{1}{n_2}\right)\right\}^{\frac{1}{2}}} \qquad \text{where} \qquad P = \frac{p_1 n_1 + p_2 n_2}{n_1 + n_2}$$

for each of the differences in proportions of persons responding to the differently worded

items with a given response option (Kanji, 1993). Adherence to the standard critical

(two-tailed) Z statistic of ±1.96 was maintained. Table 22 identifies these 8 LAPS items

and their corresponding Z-statistic. Table 23 contains the remaining 15 LAPS items

(including those items deleted from the SEM analysis), which did not yield a statistically

significant Pearson's Chi-Square. Table 24 contains the Pearson's Chi-Square values.

These results are consistent with the hypothesis of differential item functioning, though it

is unclear which item version may be functioning in a more valid manner.

<div align="center">LAPS Scores</div>

Three steps are required in producing the LAPS scores. First, evaluating each

item for normality assumptions, since this was conducted in the previous analysis, the

same deletion approach was carried over in scoring. Another step completed in the

previous analysis, involved reversing the score of the remaining one item (i.e., item H).

Lastly, generating a sum from the remaining 18-items, which have a value range from 0

to 54. Table 25 reveals the results of scores for the two groups. The scores from the

group responding to the Original scale ($n = 1854$) ranged from $10 - 54$ (*median* = 44;

mode 49). Scores from the group that responded to the Personalized scale ($n = 1849$)

ranged from $2 - 54$ (*median* = 42; *mode* 48).

Table 22

Crosstab Analysis and Z-statistic Among Significant LAPS Items

Item (Subscale) Response Set	Original (% in version)	Personalized (% in version)	Difference	Z-score	
A (PS)					
Strongly Disagree	11.5	13.5	-2	-1.2869	
SW Disagree	20.3	22.2	-1.9	1.2001	
SW Agree	41.4	42.9	-1.5	-0.9652	
Strongly Agree	26.8	21.4	5.4	3.8414	*
B (PS)					
Strongly Disagree	15.2	20.1	-4.9	-3.0788	*
SW Disagree	20.1	19.7	0.4	0.2453	
SW Agree	36.6	36	0.6	0.3771	
Strongly Agree	28.2	24.2	4	2.7677	*
D (PS)					
Strongly Disagree	9.9	14.5	-4.6	-3.0106	*
SW Disagree	18.1	20.7	-2.6	-1.5947	
SW Agree	36.7	37	-0.3	-0.1963	
Strongly Agree	35.3	27.8	7.5	4.9102	*
E (PS)					
Strongly Disagree	4.4	6	-1.6	-1.3181	
SW Disagree	10	12.2	-2.2	-1.3396	
SW Agree	36.1	38.1	-2	-1.6476	
Strongly Agree	49.5	43.7	5.8	3.5376	*
L (GA)					
Strongly Disagree	5.2	8.4	-3.2	-2.2562	*
SW Disagree	16.8	19.1	-2.3	-1.4425	
SW Agree	45.4	42.9	2.5	1.7627	
Strongly Agree	32.6	29.6	3	1.9718	*
M (GA)					
Strongly Disagree	0.1	0.8	-0.7	-1.3513	
SW Disagree	1.8	2.4	-0.6	-0.3912	
SW Agree	26.5	33.4	-6.9	-13.4491	*
Strongly Agree	71.6	63.5	8.1	5.2642	*
N (AR/W)					
Strongly Disagree	1.8	2.6	-0.8	-0.7274	
SW Disagree	8.5	12.8	-4.3	-2.6616	*
SW Agree	28.5	31.9	-3.4	-3.1124	*
Strongly Agree	61.2	52.8	8.4	5.3492	*
O (GA)					
Strongly Disagree	0.3	0.6	-0.3	-0.4869	
SW Disagree	2	4.4	-2.4	-1.6093	
SW Agree	24.1	27.5	-3.4	-5.5177	*
Strongly Agree	73.6	67.5	6.1	4.0720	*

*denotes statistically significant values

Table 23

Crosstab Analysis Among Remaining and Nonsignificant LAPS Items

Item (Subscale) Response Set	Original (% in version)	Personalized (% in version)	Difference
C (AR/W)			
Strongly Disagree	12.7	15	-2.3
SW Disagree	22.1	23.7	-1.6
SW Agree	38.3	34.6	3.7
Strongly Agree	26.9	26.6	0.3
F (PS)			
Strongly Disagree	9.7	12.6	-2.9
SW Disagree	17.9	20.1	-2.2
SW Agree	36.4	35	1.4
Strongly Agree	36	32.3	3.7
G (PS)			
Strongly Disagree	3	3.4	-0.4
SW Disagree	8	8.2	-0.2
SW Agree	35.1	31.3	3.8
Strongly Agree	53.9	57.2	-3.3
H (AR/W)			
Strongly Disagree	4.5	4.5	0
SW Disagree	10.1	11.1	-1
SW Agree	23	24.1	-1.1
Strongly Agree	62.4	60.2	2.2
I (PS)			
Strongly Disagree	4.7	4.6	0.1
SW Disagree	13.2	14.2	-1
SW Agree	42.2	41.4	0.8
Strongly Agree	39.9	39.8	0.1
J (GA)			
Strongly Disagree	1.2	1.8	-0.6
SW Disagree	4.9	6.8	-1.9
SW Agree	37.1	34.2	2.9
Strongly Agree	56.8	57.2	-0.4
K (GA)			
Strongly Disagree	0.7	1	-0.3
SW Disagree	4.2	4.8	-0.6
SW Agree	27	29.3	-2.3
Strongly Agree	68.2	64.9	3.3
P (AR/W)			
Strongly Disagree	0.3	0.8	-0.5
SW Disagree	3	3.9	-0.9
SW Agree	23.2	22	1.2
Strongly Agree	73.4	73.2	0.2

Table 23, continued

Item (Subscale) Response Set	Original (% in version)	Personalized (% in version)	Difference
Q (GA)			
Strongly Disagree	0.2	0.4	-0.2
SW Disagree	2.1	3.2	-1.1
SW Agree	23.8	24.9	-1.1
Strongly Agree	73.9	71.6	2.3
R (GA)			
Strongly Disagree	0.1	0.2	-0.1
SW Disagree	0.6	0.6	0
SW Agree	12.2	12.6	-0.4
Strongly Agree	87.1	86.6	0.5
S (GA)			
Strongly Disagree	0	0.1	-0.1
SW Disagree	0.6	0.6	0
SW Agree	12.1	14.5	-2.4
Strongly Agree	87.3	84.7	2.6
T (AR/W)			
Strongly Disagree	0.2	0.1	0.1
SW Disagree	0.4	0.3	0.1
SW Agree	9	8.3	0.7
Strongly Agree	90.3	91.3	-1
U (GA)			
Strongly Disagree	2.4	2.4	0
SW Disagree	1	1.2	-0.2
SW Agree	4.8	4.1	0.7
Strongly Agree	91.9	92.3	-0.4
V (GA)			
Strongly Disagree	0.1	0.2	-0.1
SW Disagree	0.5	0.7	-0.2
SW Agree	11.2	12.3	-1.1
Strongly Agree	88.2	86.8	1.4
W (GA)			
Strongly Disagree	0.8	1.5	-0.7
SW Disagree	4.2	6	-1.8
SW Agree	21.6	23.6	-2
Strongly Agree	73.5	68.9	4.6

Table 24

Pearson's Chi-Square Results in Crosstabs

Item (Subscale)	Pearson's Chi-Square Result
A (PS)	χ^2 (3, N = 3703) = 16.22, p. <.001
B (PS)	χ^2 (3, N = 3703) = 18.69, p. <.000
D (PS)	χ^2 (3, N = 3703) = 35.35 p. <.000
E (PS)	χ^2 (3, N = 3703) = 16.62, p. <.001
L (GA)	χ^2 (3, N = 3703) = 20.00 p. <.000
M (GA)	χ^2 (3, N = 3703) = 34.37, p. <.000
N (AR/W)	χ^2 (3, N = 3703) = 33.32, p. <.000
O (GA)	χ^2 (3, N = 3703) = 27.68, p. <.000

Table 25

Overall LAPS Scores and Subscale Scores for both Groups

	M (SD)	α
Original	41.84 (8.76)	.909
General Attachment	17.97 (2.87)	.798
Animal Rights/Welfare	9.41 (2.45)	.778
People Substituting	14.45 (4.40)	.820
Personalized	40.42 (9.33)	.912
General Attachment	17.47 (3.20)	.805
Animal Rights/Welfare	9.15 (2.60)	.792
People Substituting	13.80 (4.55)	.822

Limitations

Web-based Survey and Sampling

As briefly reviewed in chapter 4, there are several limitations to a web-based survey, one prominent is the inability to compute a response rate. Without this estimate, it is impossible to speculate on the extent of sampling bias. However, given the plentiful responses obtained in this project, it raises the question of whether the self-selected participants who participated subsequently forwarded the e-mail invitation to other persons similar to themselves in any number of ways. This is suggestive of a possible sampling bias, which is also an inherent risk in the snowball sampling technique. Simultaneous consideration of e-mail correspondences, survey (qualitative) comments, and listservs which posted the e-mail invitation, implies an appreciable, albeit indeterminate, percentage of individuals who participated in some sort of canine-related activity (e.g., rescue, agility, humane society, veterinary medicine, academic research around the relationships people have with other species). This likely sample bias may help to explain the lack of variability in the sample responses and thus limits the generalizability of the above findings.

An unavoidable sampling bias consisted of those persons categorically eliminated from participating in this survey. This group comprised of the non-internet users, those with restricted internet access and limited computer navigational skills. Accordingly, it is important to leave room for the possibility that these subpopulations may have unique differences that could have affected the results of this study. For that reason, the generalizability of these results restricts commentaries on this segment of the population.

By design, the structural equation modeling program will not operate if items contain missing values. With the luxury of a large data set the decision was made to not utilize data imputation methods for the missing items but rather listwise deletion ($n =$ 267). Admittedly, a trade off was made since eliminating cases from any analysis may knowingly but also inadvertently eliminate a subpopulation that differs significantly.

One such case exemplifies this point. An e-mail correspondence with a participant indicated the need of a "not applicable" response category for the question, "I love my pet because it never judges me." With her permission, she explains below.

> This is not true. My dog is trained to judge me, and to put limits on me when I am not clear about what I should do. For example, one of her jobs is to find places. Sometimes I try to get her to pass the place we are supposed to go since I think we are not there. While she will let me direct her (to the wrong place), it is clear that she is judging my command. If I change the command, she would not be as strong to question me. For example (this is a real life one), I told her to find the elevator. When we got near, I thought we were not yet there and made her go forward. She did, reluctantly, but when I realized she had been right and I was wrong, she felt very different in her harness. I won't put human emotions into her dog-mind, but I do think sometimes she is thinking "will you make up your mind!?"

As a result, she chose "decline to answer" on at least this one item which automatically eliminated her responses from the final analysis.

Examination of the canine names revealed 83 entries wherein participants appeared to type in the names of multiple dogs. Each of these cases were compared against the question that solicits their number of dogs who live inside or outside. If the number of dogs matched the same number indicated in a later question, along with placement of commas between the names and/or the use of a hard-return after each name, that case was deleted. Of these 83 identified cases, 73 were deleted.

Dillman (2000) suggests that "respondents do not read the entire content of questionnaires in a thoughtful way" (p. 81). Furthermore, he suspects participants assess what must be read and what can safely be ignored. A lesson taken from this project would be the reiteration of, "Please type the **name of ONE dog** below" just above the text box.

CHAPTER 6

DISCUSSION AND FUTURE DIRECTIONS

It's easy to stop making mistakes. Just stop having ideas.
(Proverb)

In the first five days, this internet-based survey recorded 5,314 hits to its welcome page. Of these, 4,043 (76%) participants reached the final webpage, unlike the 1,271 users who did not for reasons unknown. Additional deletions from the initial data set were required because of missing values in the Lexington Attachment to Pets Scale (LAPS) (Johnson et al., 1992) items ($n = 267$) and entering multiple dog names into the survey ($n = 73$). The final analysis used the remaining 3,703 cases or 70% of the data. According to the descriptive statistics of the collected human and canine demographics, the alternate assignment to the Original or Personalized survey generated very similar groups.

Advancing our understanding of the relationships humans have with canines and the hypothesized constructs requires hypothesis-testing, like this proposed model, made possible by SEM (Schumacker & Lomax 2004). According to the data from the current study, the measurement model as identified by Johnson et al. (1992) was not consistent with the data. As a result, comparing the structure coefficients between the two groups were inappropriate (Byrne, 2001).

While the results of this study made it inadvisable to further examine the differential validity associated with the language differences in the scale items, critical information was nonetheless identified. According to the data in the current study, the LAPS conceptualization of "pet attachment" (*sic)* may not be valid. There are at least

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two possible explanations for the lack of fit between the measurement model and this study's data. Either the measurement model is incorrect in some way, or the data collected represents a unique segment of the U.S. population, suggesting that their "pet attachment" (*sic*) differs from that of the general population. Until further research provides stronger evidence, use of this scale could very well produce results that lead to invalid inferences. Clearly, the affectional relationships between people and their dogs as conceptualized and quantified by the LAPS is still a work in progress. Specifically, psychometric work is critically necessary for those interested in using the LAPS.

When data does not fit the measurement model, a next step is to respecify the hypothesized measurement model. A sound theoretical framework and/or additional empirical information should drive the respecification. For example, one approach would be to decide if each item needs reassignment by deliberating on each item for its conceptual meaning and its contribution to the overall scale score. One potential outcome of this exercise would be that the measurement model will be changed in its structure by having, for example, two latent constructs, rather than the current three.

<center>Data Collection Methods</center>

The number of persons who responded to the e-mail invitation was quite unexpected. One plausible reason for this success was that the e-mail invitation reached an audience unusually enthusiastic about dogs, or at least a sample of people who are highly invested in their relationships with their canine companions. Numerous correspondences through e-mails, as well as survey comments, support this conjecture. A few examples of such survey comments include: "This is a great survey;" "I enjoyed taking this survey;" "Very interesting survey;" "Thank you for doing this research;" "I

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would very much like to see the results of this study;" and, "I look forward to the results," with most of these respondents including their e-mail address hoping to gain access to these results. Further evidence of people interested in the study was the multiple e-mail contacts to this researcher asking to participate.

Another potentially generous resource was the use of listservs. This author posted the invitation on four listservs; then, others submitted the invitation on their exclusive and inclusive listservs. Posting of the invitational e-mail elsewhere is known because several individuals sought this author's permission to do so. Lastly, multiple survey comments indicated the survey was easy to complete, which is an important factor in any survey but particularly for a web-based survey.

<div align="center">Crosstabs Analysis</div>

Results of the crosstab analysis suggest that at least 8 of the 23 LAPS items may lead to differentially valid inferences as a function of language. However, a significant limitation with this analysis was the inability to determine how the items function differently. These inconclusive and ambiguous results should serve as a motivator for other researchers to investigate further this project's hypothesis that the Personalized LAPS survey will produce more valid inferences concerning "pet attachment" (*sic*) than the Original LAPS. One interesting finding in the current study that may be used by future researchers was that each of the items that produced statistically significant results between the two LAPS versions appeared to endorse at least one of the response options that included the term 'strongly' (i.e., strongly agree; strongly disagree).

The last observation from the current results that may be a clue as to how the items function differently was that half of the statistically significant items were from

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what the previous author's of the LAPS dubbed the "People Substituting" subscale. Curiously, this was also the only subscale that did not have items deleted from the SEM analysis for violating the normality assumptions.

This author challenges the implications inherent in the label of this particular subscale. This label suggests that the items within this "People Substituting" subscale measure the extent to which people substitute human relationships for the relationship with their dog. In the view of this author, however, the majority of these items seem to inquire about the extent to which a person has an emotional investment in their relationship with their dog. Without there being similar questions around the relationships the human has with other humans for comparison, the distinction of 'substituting' is arguably inappropriate and misleading.

Directions for Future Research

The results of this study offer a number of reasons for an investigative resurgence into the conceptualization and quantification of "pet attachment" (*sic*). Most of the "pet attachment" (*sic*) scales were created over a decade ago and, presumably, attitudes, behavior, and language have evolved over the intervening time period. Therefore, periodic psychometric evaluations of currently used scales should regularly occur. Once the anthrozoological field rises to the level of a standard measure of how humans perceive and/or relate to members of another species, future work has a sophisticated, substantial foundation on which to expand. However, in order for the standardized measure(s) to emerge, improved psychometrics will be necessary.

A significant hindrance to conducting this empirical work is the lack of support, especially financial support, which in turn negatively impacts dedicated scholarly time to

such work. Without this support, the necessary psychometric work on new and improved

scales will likely reflect this shortfall. Pointed efforts demonstrating the value of this

work will likely be an antecedent to funding.

Like similar preceding studies, the greater part of the responses to the forms of the

LAPS in the current study seem to be from a segment of the population highly invested in

their dogs and who consider them to be irreplaceable family members. However, in

hindsight this result is not terribly surprising, considering the purpose of the snowball

sampling technique. Implementation of this nonprobability sampling technique is

designed to target elusive populations and for exploratory research (Rubin & Babbie,

2001). An extensive gap still exists in the literature for people who do not share the same

level of investment or priceless affection. Perhaps distinguishing between these different

human populations could make use of the discarded LAPS items in this study. Prior to

the final analysis five items (i.e., r, s, t, u, v) were eliminated because of their extreme

negative skewness, that is, a minimum of 86% of the participants 'strongly agreed' with

the respective statements.

Future research targeting the previously mentioned population gap could integrate

these item characteristics as screening criteria. The difficulty in recruiting such a

population, however, has natural obstacles. What intrinsic reward or interest would a

person have in spending time completing a survey about their canine when they do not

consider them as members of the family or possessing any sentimental value, but rather,

are viewed as a commodity? Time spent on recruitment methods, where this specific

population would participate, has the potential to reveal a score continuum with greater

variability. Participation in future studies by various subpopulations will likely yield

greater variability in responses, which is another important step toward the development of a well validated and standardized scale for making inferences about "pet attachment" (*sic*). Until responses from this segment of the population are captured, our ability to identify items that differentiate one population from another, or those that illicit variance in the responses, will remain limited.

There is an important cautionary note regarding items used to separate people according to pre-assigned attitudes/perspectives/perceptions toward a member of another species. When generating the aforementioned screening items, word choices and their inherent assumptions must be meticulously challenged. Otherwise, potential participants could decline to participate because of the offensive implication of the questions and/or cause failure to differentiate between important population segments. One example is the use of the discriminating word 'value' in a question such as, "Do you value your dog?" It seems likely that most people will respond affirmatively to that question, although for distinctive and different reasons that may cloud the proper and valid inference to be made from responses to this item. Additionally, by carefully scrutinizing the adjectives used to screen people will contribute directly to the project's narrative later, thus lessening the author's agonizing task in selecting unbiased words.

The literature reveals efforts to categorize people from "high attachment" to "low attachment." One such example, previously mentioned, involved looking at the "ethnic variations in animal companion ("pet") attachment" (Brown, 2003, p. 101). Using the Pet Attachment Questionnaire (PAQ) (Stallones, Johnson, Garrity & Marx, 1990), Brown reported that Caucasian veterinary students had "significantly higher PAQ scores than did African American" veterinary students (p. 101). Cautioning the interpretation and

generalizations of the results, she cites the limitations of her study by the lack of collected data on socio-economic status, housing, urban and rural background. Brown also stressed the need for sensitivity in how each culture expresses their "attachment." Identifying racial differences can be viewed as inflammatory and invite unintended reactions, despite the cautionary statement, as in this study (S. E. Brown, personal communication, April 11, 2003). This case illustrates how crucial it is that instruments used be psychometrically sound and culturally sensitive.

Despite the fact that this study provided inconclusive evidence concerning differential validity as a function of the use of the word *pet* in the scale items, future empirical work that deliberates and carefully weighs the linguistic challenges inherent in writing valid scale items will extend the knowledge base. Future theoretical work may also benefit from this struggle. As pre-existing "pet attachment" (*sic)* surveys are adapted, the words used in the items, especially referring to a member of another species, deserve serious considerations. The qualitative data collected in this survey reinforced this suggestion.

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APPENDICES

Appendix A

List of Anthrozoological Research Excluded

Appendix A
List of Anthrozoological Research Excluded

Excluded Criteria: *Measured Dimension/Situation (Study location)*	Original Study	Instrument
Animal-Assisted Therapy/ Service Animal		
(MO)	Banks & Banks, 2002	Demographic and Pet History Questionnaire (DPHQ)
(NJ)	Fried, 1996	Pet Visitation Program Survey Form
(IL)	Heimlich, 2001	Measurement of Pet Intervention (MOPI)
(IN)	Rud & Beck, 2003	Survey on Pet Animals in the Classroom
(TX)	Zapf & Rough, 2002	Service Animal Adaptive Intervention Assessment (SAAIA)
(Japan & UK)	Miura, Bradshaw, & Tanida, 2002	Assistance Dog Questionnaire
Attachment		
	Brakenridge & Shoemaker, 1996	Equine Client Attachment Checklist
(US & abroad)	Chumley, Gorski, Saxton, Granger, & New, 1993	21-item Pet Attachment Scale
(Netherlands)	Endenburg, 1995	Attachment of People to Companion Animals
	Greene & Landis, 2002	Pet Attachment Worksheet (PAW)
(Hungary)	Naderi, Miklosi, Doka & Csanyi, 2002	Does dog-human attachment affect their inter-specific cooperation
(UK)	Rooney & Bradshaw, 2003	Links between play and dominance and attachment dimensions of dog-human relationships
(UK)	Serpell, 1996	Serpell's 1 question & 3 Likert response set
(Hungary)	Topal, Miklosi, Csanyi, & Doka 1998	Strange Situation Test

Appendix A, continued

Excluded Criteria: Measured Dimension/Situation (Study location)	Original Study	Instrument
Attitude		
(Australia)	Blackshaw & Blackshaw, 1993	Student Perceptions of Attitudes to the Human Animal Bond
(Australia)	Bowd, 1984	Scale of Attitudes toward the Treatment of Animals
(GA)	Crowell, Smith, Oliver, Simpson, & Adams, 1987	Attitude Towards Animal Uses
(UK)	Fidler, Light, & Costall, 1996	Describing dog behavor psychologically: Pet owners vs. non owners
(Wales)	Ray, 1982	Attitude Toward Animals and Attitude Toward People Scale
(UK & Japan)	Miura, Bradshaw & Tanida, 2000	Dog Attitude Questionnaire (DAQ)
(MO & KS)	Selby, Rhoades, Heweet, & Irvin, 1979	Public Attitude Survey
Canine Behavior		
(Germany)	Call, Bräuer, Kaminski, & Tomasello, 2003	Domestic dogs are sensitive to the attentional state of humans
(UK)	Jagoe & Serpell, 1996	Owner characteristics and interactions & the prevalence of canine behaviour problems
Child & Adolescent Population		
	Ascione & Weber, 1995	Children's Observation and Experience with their Pets (COEP)
(CA)	Bryant, 1990	Pet Costs Inventory
(IL)	Davis, 1987	Dog Ownership History questionnaire
(IL)	Davis, 1987	Pet/Friend Q-Sort

Appendix A, continued

Excluded Criteria: Measured Dimension/Situation (Study location)	Original Study	Instrument
(IL)	Davis & Juhasz, 1995	Pet Friendship Scale
(France)	Filiatre, Millot, Montagner, Eckerlin, & Gagnon, 1988	Advances in the study of the relationship between children and their pet dogs
	Furman, 1989	"My Pet" Inventory
(MN)	Gage & Magnuson-Martinson, 1988	Companion Animal/Baby Interaction Attitude Index (CABIAI)
(UK)	McNicholas & Collis, 2001	Children's Representations of Pets
(IN)	Melson, Peet & Sparks, 1991	Pet Attachment Scale - Revised (for children)
(IN)	Melson, 1988	Melson Parent Questionnaire
(Canada)	Nielsen & Delude, 1989	Observing behavior of young children in the presence of different animals
(UK)	Paul & Serpell, 1992	Why children keep pets: The influence of child & family characterists
(KS)	Poresky, 1990	Young Children's Empathy Measure
(CA)	Siegel, 1990	Human/Pet Relationships Measure
Death - Loss/Grief		
(Ontario)	Adams, 1997	People's Experiences Following the Death of a Pet
(Australia)	Davis, Irwin, Richardson & Obrien-Malone, 2003	Pet Loss and Religious Issues Interview
(CA)	Planchon, Templer, Stokes, & Keller, 2002	Pet Loss Questionnaire

Appendix A, continued

Excluded Criteria: Measured Dimension/Situation (Study location)	Original Study	Instrument
Domestic Violence/ Animal Cruelty		
	Ascione, 1988	Intermediate Attitude Scale: Assessment of 3rd through 6th graders' attitudes toward the treatment of animals
	Ascione & Weber, 1995	Battered Partner Shelter Survey - BPSS/Pet Maltreatment Survey
	Ascione, 2000	Domestic Violence Pet Abuse Survey (DVPAS)
	Ascione, Thompson & Black, 1997	Children and Animals Assessment Instrument (CAAI)
(Netherlands)	Baldry, 2004	Physical & Emotional Tormenting against Animals Scale (PET)
(OH)	Baker, Boat, Grinvalsky, & Geracioti, 1998	Boat Inventory on Animal-Related Experience
(Australia)	Dadds, Whiting, Bunn, Fraser, Charlson, & Pirola Merlo, 2004	Cruelty to Animals Inventory
(Australia)	Guymer, Mellor, Luk & Pearse, 2001	Children's Attitudes and Behaviors Toward Animals (CABTA)
	Lewchanin & Zimmerman, 2000	Clinical Assessment of Juvenile Animal Cruelty
	Lockwood, 2000	Assessment of Dangerness in Perpetrators of An Cruelty
(Australia)	Thompson & Gullone, 2003	Children's Treatment of Animals Questionniare (CTAQ)

Appendix A, continued

Excluded Criteria: *Measured Dimension/Situation* *(Study location)*	*Original Study*	*Instrument*
Emotion/Affect		
(UK)	Davey, 1994	Animal Fears Questionnaire
(UK)	Paul, 2000	Animal Empathy Scale (AES)
(Australia)	Ray, 1982	Love of Animals and Love of People
Perception		
(UK)	Serpell, 1983	Animal Human Compatibility Scale
Personality of Other Species		
(e-research)	Gosling & Bonnenburg, 1998	Pet Personality Trait Rating Scale
Physiological		
(NE)	Baun, Bergstrom, Langston & Thoma, 1984	Physiological Effects of Hu/An Bonding
(S. Africa)	Odendaal & Meintjes, 2003	Neurophysiological correlates of affiliative behaviour between humans and dogs
Projective Test		
(PA)	Lockwood, 1983	Animal Thematic Apperception Test (ATAT)
	Murray, 1943	Children's Apperception Test - animal figures (CAT)
(Spain/Holland)	Pigem (1949) (as cited in Van Krevelen, 1956)	Animal Preference Test (APT)
Relationship		
(Canada, Great Britain & US)	Barker & Barker, 1988	Pet's Place in the Family Life Space Diagram
(Australia)	Dwyer, Bennett, & Coleman, 2006	Monash Dog Owner Relationship Scale

Appendix A, continued

Excluded Criteria: Measured Dimension/Situation (Study location)	Original Study	Instrument
(Canada)	Eckstein, 2000	Pet Relationship Impact Inventory
(UK)	Paul & Serpell, 1993	Childhood Pet Ownership Questionnaire
Social History/ Qualitative		
	Bustad, 1980	Pet and Personal History Questionnaire
(CA)	Allen, Kellegrew & Jaffe, 2000	Pet Ownership Interview Guide & Observations

Appendix B

Comprehensive List of Human-Canine Scales under Consideration

Appendix B
Comprehensive List of Human-Canine Scales under Consideration

Inclusion Criteria: Measured dimension	Original Study	Instrument
Anthropomorphism		
(RI)	Albert & Bulcroft, 1987	Anthropomorphic Scale
Attachment		
(TX)	Andrews, 1992	***Inventory of Pet Attachment (IPA)**
(RI)	Albert & Bulcroft, 1987	Pet Attachment Scale
(MN)	Holcomb, Williams & Richards, 1985	***CENSHARE Pet Attachment Scale**
(KY)	Johnson, Garrity & Stallones, 1992	***Lexington Attachment to Pets Scale (LAPS)**
(OH)	Staats, Miller, Carnot, Rada, & Turnes, 1996	Pet Relationship Scale
(USA)	Stallones, Johnson, Garrity & Marx, 1990	Pet Attachment Questionnaire (PAQ)
(USA)	Stallones, Marx, Garrity, & Johnson, 1988	Pet-Attachment Index
(CA)	Zasloff, 1996	***Comfort from Companion Animals Scale (CCAS)**
Attitude		
(TN)	Netting, Wilson, & New, 1984a	Pet Attitude Inventory
(AL & CA)	Templer, Salter Dicker, Baldwin & Veleber, 1981	***Pet Attitude Scale (PAS)**
(PA)	Voith, 1985	Attachment of people to companion animals
Bonding		
(TX)	Angle, Blumentritt & Swank, 1994 (cited in Angle, 1995)	Pet Bonding Scale
(KS)	Poresky, Hendrix, Mosier & Samuelson, 1987	***Companion Animal Bonding Scale (CABS)**
Commitment		
(OH)	Staats, Miller, Carnot, Rada & Turner, 1996	***Miller-Rada Commitment to Pets Scale**

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Appendix B, continued

Inclusion Criteria: Measured dimension	Original Study	Instrument
Expectations		
(CA)	George, 1989 (as cited in Kidd, Kidd, & George, 1992)	Pet Expectations Inventory (PEI)
Perception		
(KS)	Poresky, Hendriz, Mosier & Samuelson, 1988a	Companion Animal Semantic Differential
(OH)	Walton & McConcocha, 1996	Relational Dimensions of Dog Ownership
Personality of Other Species		
(TX)	Gosling, Kwan, & John, 2003	A dog's got personality: A cross-species comparative approach to personality judgments in dogs and humans
Relationship		
(NY)	Blankman, 2002	The relationship among childhood attachment history, adult attachment, social network & owning a dog or cat
(KS)	Keil, 1990	Human-Animal Relationship Questionnaire
(PA)	Lago, Kafer, Delaney & Connell, 1988	***Pet Relationship Scale**

* Indicates selected scales used in the discussion of this paper.

Appendix C

The Pet Attitude Scale (PAS)
Templer, Salter, Dickey, Baldwin, & Veleber, 1981

Age _____
Sex _____

The Pet Attitude Scale

Please answer each of the following questions as honestly as you can, in terms of how you feel right now. This questionnaire is anonymous and no one will ever know which were your answers. So, don't worry about how you think others might answer these questions.   There aren't any right or wrong answers. All that matters is that you express your true thoughts on the subject.

Please answer by circling one of the following seven numbers for each question:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	unsure	slightly agree	moderately agree	slightly agree

For example, if you slightly disagree with the first item, you would circle 3.
Thank you for your assistance.

_____

LOVE AND INTERACTION:
7.   I spend time every day playing with my pet (or I would if I had one).
8.   I have occasionally communicated with a pet and understood what it was trying to express.
11. I love pets.
16. I frequently talk to my pet.

PETS IN THE HOME:
2.   My pet means more to me than any of my friends.
3.   I would like a pet in my home.
4.   Having pets is a waste of money.
6.   I feel that pets should always be kept outside.
9.   The world would be a better place if people would stop spending so much time caring for   their pets and started caring more for other human beings instead.
12. Animals belong in the wild or in zoos, but not in the home.
13. If you keep pets in the house you can expect a lot of damage to furniture.
14. I like house pets.
15. Pets are fun but it's not worth the trouble of owning one.
18. You should treat your housepets with as much respect as you would a human member of your family.

JOY OF PET OWNERSHIP:
1. I really like seeing pets enjoy their food.
5. Housepets add happiness to my life (or would if I had one).
10. I like to feed animals out of my hand.
17. I hate animals.

Appendix D

The Pet Attitude Scale – Modified (PAS-M)
Munsell, Canfield, Templer, Tangan, & Arikawa, 2004

Age _____
Sex _____

Pet Attitude Scale – Modified

Please answer each of the following questions as honestly as you can, in terms of how you feel <u>right now</u>. This questionnaire is anonymous and no one will ever know which were your answers, so don't worry about how you think others might answer these questions. There aren't any right or wrong answers. All that matters is that you express your true thoughts on the subject.

Please answer by circling one of the following seven numbers for each question:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	unsure	slightly agree	moderately agree	slightly agree

For example, if you slightly disagree with question number one, you would circle the number three for slightly disagree.

Thank you for your assistance.

_____

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

*Denotes the modified items

Appendix E

CENSHARE Pet Attachment Survey
Holcomb, Williams, & Richards, 1985

Response set:
Almost always, often, sometimes, almost never

RELATIONSHIP MAINTENANCE:
2. You like to touch and stroke your pet.
3. You are too busy to spend time with your pet.
5. You spend time each day playing with or exercising your pet.
6. Your pet comes to greet you when you arrive.
8. You talk to your pet as a friend.
9. Your pet is aware of your different moods.
11. Your pet pays attention and obeys you quickly.
12. You confide in your pet.
14. You play with your pet when he/she approaches.
15. You spend time each day training your pet.
16. You show photos of your pet to your friends.
18. You spend time each day grooming your pet.
20. You ignore your pet when she/her approaches.
21. When you come home, your pet is the first one you greet.
25. Your pet tries to stay near you by following you.
26. You buy presents for your pet.

INTIMACY:
1. Within your family, your pet likes you best.
4. You prefer to be with your pet more than with most people you know.
7. When your pet misbehaves, you hit him/her.
10. Your pet is a nuisance and a bother to you.
13. You consider your pet to be a member of your family.
17. When you feel bad, you seek your pet for comfort.
19. You feel sad when you are separated from your pet.
22. You like to have your pet sleep near your bed.
23. You like to have your pet sleep on your bed.
24. You have your pet near you when you study, read, or watch TV.
27. You don't like your pet to get too close to you.

Appendix F

Companion Animal Bonding Scale (CABS)
and
Childhood Companion Animal Bonding Scale
Poresky, Hendrix, Mosier, & Samuelson, 1987

Contemporary Companion Animal Bonding Scale

Response set:
5 = Always   4 = Generally   3 = Often   2 = Rarely   1 = Never

1. How often are you responsible for your companion animal's care?
2. How often do you clean up after your companion animal?
3. How often do you hold, stroke, or pet your companion animal?
4. How often does your companion animal sleep in your room?
5. How often do you feel that your companion animal is responsive to you?
6. How often do you feel that you have a close relationships with your companion animal?
7. How often do you travel with your companion animal?
8. How often do you sleep near your companion animal?

Childhood Companion Animal Bonding Scale

Response set:
5 = Always   4 = Generally   3 = Often   2 = Rarely   1 = Never

1. How often were you responsible for your companion animal's care?
2. How often did you clean up after your companion animal?
3. How often did you hold, stroke, or pet your companion animal?
4. How often did your companion animal sleep in your room?
5. How often did you feel that your companion animal was responsive to you?
6. How often did you feel that you had a close relationships with your companion animal?
7. How often did you travel with your companion animal?
8. How often did you sleep near your companion animal?

Appendix G

Pet Relationship Scale (PRS)
Lago, Kafer, Delaney, & Connell, 1988

Pet Relationship Scale

Response set:
strongly agree; agree; disagree; strongly disagree

AFFECTIONATE COMPANIONSHIP:
1. There are times I'd be lonely except for my pet.
2. My pet and I watch TV together frequently.
3. I give gifts to my pet for birthdays and special occasions.
4. My pet is a valuable possession.
5. I talk to my pet about things that bother me.
6. I miss my pet when I am away.
7. Making me laugh is part of my pet's job.
8. My pet gives me a reason for getting up in the morning.

EQUAL FAMILY MEMBER STATUS
1. My pet is a member of the family.
2. I share my food with my pet.
3. My pet knows when I'm upset and tries to comfort me.
4. My pet is constantly at my side.
5. My pet is an equal in this family.
6. I treat my pet to anything I happen to be eating if he/she seems interested.
7. In many ways my pet is the best friend I have.

MUTUAL PHYSICAL ACTIVITY
1. My pet helps me to be more physically active.
2. I spend a lot of time cleaning and grooming my pet.
3. I take my pet along when I go jogging or walking.
4. My pet goes to the veterinarian for regular checkups and shots.
5. I enjoy having my pet ride in the car with me.
6. I bathe my pet regularly.
7. My pet and I often take walks together.

Appendix H

Lexington Attachment to Pets Scale (LAPS)
Johnson, Garrity, & Stallones, 1992

Lexington Attachment to Pets Scale

Items introduced by the following statement in the original telephonic survey:
I'd like to ask you whether you agree or disagree with some very brief statements about your favorite pet. For each statement, please tell me whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree.

Items introduced by the following statement in this e-Research:
I'd like to ask you whether you agree or disagree with some very brief statements about the dog you identified. For each statement, please tell me whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree.

Response set:
0 = strongly disagree 1 = somewhat disagree 2 = somewhat agree 3 = strongly agree

GENERAL ATTACHMENT:
q. I play with my pet quite often.
v. Owning a pet adds to my happiness.
o. My pet and I have a very close relationship.
s. My pet makes me feel happy.
r. I consider my pet to be a great companion.
*u. I am not very attached to my pet.
j. My pet knows when I'm feeling bad.
k. I often talk to other people about my pet.
w. I consider my pet to be a friend.
m. I believe that loving my pet helps me stay healthy.
l. My pet understands me.

PEOPLE SUBSTITUTING:
f. I love my pet because he/she is more loyal to me than most of the people in my life.
a. My pet means more to me than *any* of my friends.
i. I love my pet because it never judges me.
e. Quite often, my feelings toward people are affected by the way they react to my pet.
d. I believe my pet is my best friend.
b. Quite often I confide in my pet.
g. I enjoy showing other people pictures of my pet.

ANIMAL RIGHTS/ANIMAL WELFARE:
n. Pets deserve as much respect as humans do.
c. I believe that pets should have the same rights and privileges as family members.
t. I feel that my pet is a part of my family.
*h. I think my pet is just a pet.
p. I would do almost anything to take care of my pet.

*reverse score (for two items)

Appendix I

Inventory of Pet Attachment (IPA)
Andrews, 1992

Inventory of Pet Attachment (IPA)

Please indicate to what degree each statement is true regarding your relationship with your pet. (If you have more than one pet, keep in mind the pet you feel closest to.) Select a number between 1 and 7 that best describes your response to the statement. Please mark your answer to the left.

```
\---------------\---------------\---------------\---------------/---------------/---------------/
   1             2             3             4             5             6             7
Completely                            Partly False,                        Completely
False                                 Partly True                               True
```

_____1. I frequently buy toys and trinkets for my pet.
_____2. I worry about the welfare of my pet when it is left alone.
_____3. I feel very sad when I routinely leave my pet alone during the course of the day.
_____4. I would rather spend time with my friends than with my pet.
_____5. As time goes by, I feel closer to my pet.
_____6. My pet understands my moods.
_____7. When my pet is alone, I spend a great deal of time worrying that it is lonely.
_____8. When sad or troubled, I turn to my pet, rather than family/friends, for comfort.
_____9. The well being of my pet is even more important than my own.
_____10. I think my pet experiences feelings the same way people do.
_____11. I am the happiest when I spend time with my pet.
_____12. My family/friends think I spend too much time and energy on my pet.
_____13. If I had to, I would choose my pet over other relationships.
_____14. I do not intend to make provisions for my pet in my will.
_____15. I like for my pet to sleep with me in my bed.
_____16. I prefer the company of my pet to people.
_____17. If something were to happen to my pet, I would fall apart.
_____18. I tell my troubles to my pet.
_____19. I plan to have my pet cremated or buried in a pet cemetery when it dies.
_____20. I have spent a large portion of my income on my pet.
_____21. I would rather spend an evening with my friends than with my pet.
_____22. I spend a great deal of my spare time interacting with my pet.
_____23. I like for my pet to be near me at all times.
_____24. I often deny myself things in order to take care of my pet.
_____25. I enjoy grooming my pet.
_____26. I treat my pet more like my child than a pet.
_____27. My pet has special needs that only I can fulfill.
_____28. I talk to my pet about problems that I don't talk to other people about.
_____29. If I could, I would take my pet with me where ever I went.
_____30. My pet understands me better than the people in my life.
_____31. I spend as much of my free time with my pet as possible.
_____32. I feel as though my pet is more like a human than an animal.
_____33. My pet is the most important thing in the world to me.
_____34. I feel closer to my pet than I do to my closest family member or friend.
_____35. I like to sleep close to my pet.

Appendix J

Miller-Rada Commitment to Pets Scale
and
Modified Pet Attachment Scale
Staats, Miller, Carnot, Rada, & Turner, 1996

Miller-Rada Commitment to Pets Scale

For the following questions, please circle the number representing your degree of agreement.
1 = strongly agree   2 = agree   3 = neutral   4 = disagree   5 = strongly disagree

1. If a pet destroyed a $50 piece of furniture or personal item, I would get rid of it.
2. If a pet destroyed a $4000 piece of furniture or personal item, I would get rid of it.
3. If a young pet required extensive veterinary care, I would get rid of it.
4. If an old pet required extensive veterinary care, I would get rid of it.
5. If a three-month-old puppy or kitten were having problems with housebreaking, I would get rid of it.
6. If a six-month-old puppy or kitten were having problems with housebreaking, I would get rid of it.
7. If an adult dog or cat were having problems with housebreaking, I would get rid of it.
8. If a three-month-old puppy or kitten were having problems with destructiveness, I would get rid of it.
9. If a six-month-old puppy or kitten were having problems with destructiveness, I would get rid of it.
10. If an adult dog or cat were having problems with destructiveness, I would get rid of it.

Modified Pet Attachment Scale

How many pets do you own? _____

Circle the number representing your degree of agreement
1 = strongly agree, 2 = agree, 3 = agree, 4 = disagree, 5 = strongly disagree

1. I meet new people because of my pet.
2. My pet is more bother than it is worth.
3. My pet helps me get through tough times.
4. I wish I did not have a pet.
5. There are times I'd be lonely without my pet.
6. My pet gives me a reason for getting up in the morning.
7. My pet knows when I'm upset and tries to comfort me.
8. My pet helps me to be more physically active.
9. I feel committed and responsible for the care of my pet.
10. I miss my pet when I am away from home.
11. I do not intend to get another pet in the future.
12. My pet is like a member of the family.

Appendix K

Comfort from Companion Animal Scale (CCAS)
Zasloff, 1996

Comfort from Companion Animal Scale

Response set:
1 = strongly disagree   2 = disagree   3 = agree   4 = strongly agree

1. My pet provides me with companionship.
2. Having a pet gives me something to care for.
3. My pet provides me with pleasurable activity.
4. My pet is a source of constancy in my life.
5. My pet makes me feel needed.
6. ** My pet makes me feel safe.
7. My pet makes me play and laugh.
8. Having a pet gives me something to love.
9. ** I get more exercise because of my pet.
10. I get comfort from touching my pet.
11. I enjoy watching my pet.
12. My pet makes me feel loved.
13. My pet makes me feel trusted.

**Denotes items eliminated to reduce speciesism bias

Appendix L

LAPS Modified version: Personalized

Lexington Attachment to Pets Scale
MODIFIED VERSION: PERSONALIZED
<u>"Bailey" used as example*</u>

I'd like to ask you whether you agree or disagree with some very brief statements about the dog you identified. For each statement, please tell me whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree.

Response set:
0 = strongly disagree 1 = somewhat disagree 2 = somewhat agree 3 = strongly agree

a. <u>Bailey</u> means more to me than *any* of my friends.
b. Quite often I confide in <u>Bailey</u>.
c. I believe that <u>Bailey</u> should have the same rights and privileges as family members.
d. I believe <u>Bailey</u> is my best friend.
e. Quite often, my feelings toward people are affected by the way they react to <u>Bailey</u>.
f. I love <u>Bailey</u> because he/she is more loyal to me than most of the people in my life.
g. I enjoy showing other people pictures of <u>Bailey</u>.
h. I think <u>Bailey</u> is just a pet.
i. I love <u>Bailey</u> because <u>he/she</u> never judges me.
j. <u>Bailey</u> knows when I'm feeling bad.
k. I often talk to other people about <u>Bailey</u>.
l. <u>Bailey</u> understands me.
m. I believe that loving <u>Bailey</u> helps me stay healthy.
n.   <u>Bailey</u> deserve<u>s</u> as much respect as humans do.
o. <u>Bailey</u> and I have a very close relationship.
p. I would do almost anything to take care of <u>Bailey</u>.
q. I play with <u>Bailey</u> quite often.
r. I consider <u>Bailey</u> to be a great companion.
s. <u>Bailey</u> makes me feel happy.
t. I feel that <u>Bailey</u> is a part of my family.
u. I am not very attached to <u>Bailey</u>.
v. <u>Living with Bailey</u> adds to my happiness.
w. I consider <u>Bailey</u> to be a friend.

*Underlining indicates modifications

Appendix M

SEM Model
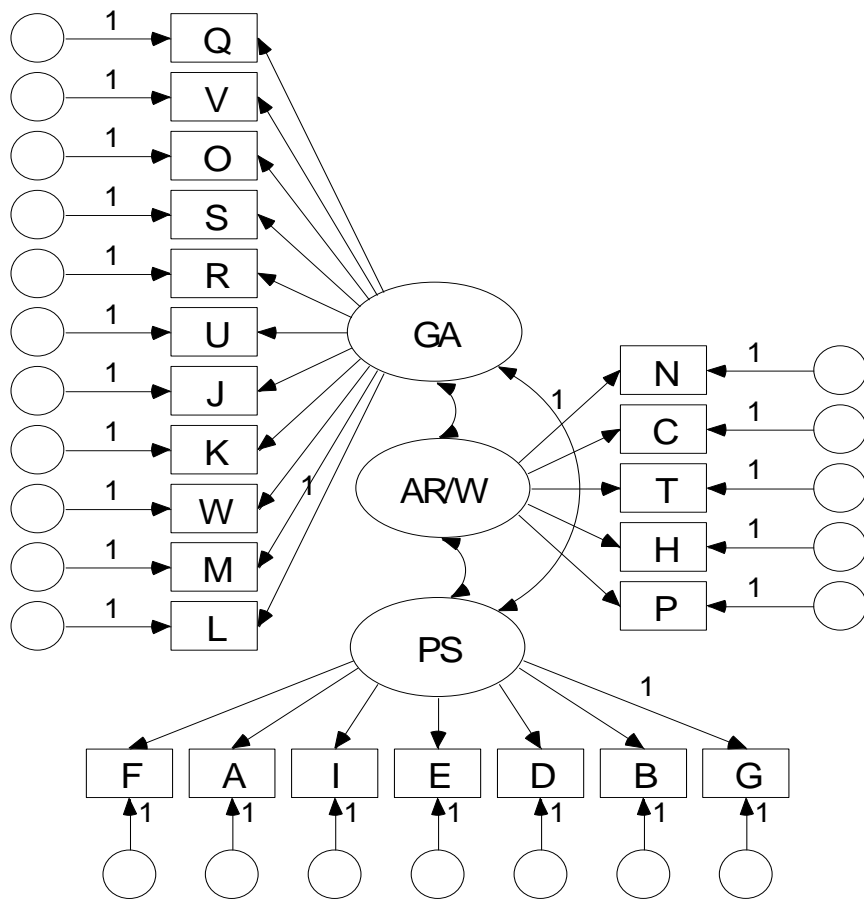
* See next page for SEM Legend

SEM Legend

Factor loadings		Residual variance

Unobserved variable → Observed variable ← Error term

GA; AR/W; PS

*

Individual LAPS scale items
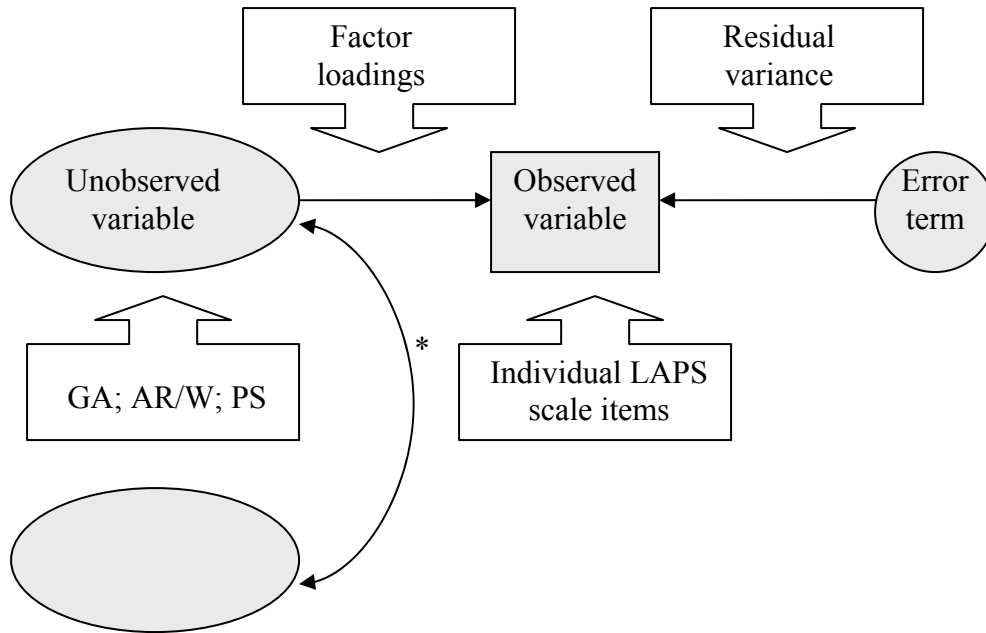
GA = General Attachment
AR/W = Animal Rights/Animal Welfare
PS = People Substituting
* Double-headed arrows denote covariance between pairs of variables
Factor loadings = the extent to which an observed variable is able to measure the unobserved variable
Residual variance = represents the amount of not explained by item loading on factor
Error term = measurement error

Appendix N

Demographic Data Profile

Demographic Data Profile

> - Respondents are not given the option to "Decline to answer" on the four qualifying questions in an effort to screen out ineligible participants. All remaining questions offered the "Decline to answer" as an option.
> - Respondents who "Decline to answer" on question #5 or #6 (canine's name or reference) were also directed out of the survey. Selecting "Decline to answer" on the remaining questions however, did allow progression through the survey.
> - {#Name} represents the text participants entered in the question asking canine's name or words used to refer to the identified canine (question 5 or 6).

QUALIFYING QUESTIONS:

1. How old are you? (in years)
   a. If < 18 years = exits survey

2. Where in the United States do you live?
   a. I do not live in the United States = exits survey
   b. Washington, DC
   c. 50 states are listed individually

3. How many dogs currently live **inside** your home and for whom you are responsible at least some of the time?
4. How many dogs currently live **outside** your home and for whom you are responsible at least some of the time?
   a. If the answer to both questions (#3 & 4) are zero = exits survey

CANINE QUESTIONS:

5. Please type in the name of your dog.

   If you have multiple dogs who live inside, or outside, your home and for whom you are responsible at least some of the time, please select one and type in this dog's name. Please keep this dog you named in mind as you answer the remaining questions.
   a. If text is entered then the program systematically alternates assignment to one of the two LAPS surveys, by passing question #6.
   b. My dog has no name = directed to question #6
   c. Decline to answer = exits survey

6. If your dog does not have a name, please enter 1 or 2 words used to refer to this dog.

If you have multiple dogs who live inside, or outside, your home and for whom you are responsible at least some of the time, please select one and type in the word(s) used to refer to this dog. Please keep this dog you named in mind as you answer the remaining questions.
   a. If text is entered, always directed to the original LAPS
   b. Decline to answer = exits survey

RESPONDENTS PRESENTED WITH THE LAPS ORIGINAL OR MODIFIED SURVEY AT THIS TIME.

7. Which gender is {#Name}?
   a. Male
   b. Female

8. Has {#Name} been neutered or spayed? (surgery that prevents reproduction/pregnancy)
   a. Yes
   b. No

9. To what extent have you noticed the following in {#Name}?
   a. {#Name} enjoys traveling with me.
   b. After I've been away, {#Name} appears excited to see me when I return.
   c. {#Name} makes efforts to be close to me.
   d. When we are away from home, {#Name} approaches strangers happily.
   e. {#Name} enjoys time spent with most of my human friends.
   f. I've seen {#Name} behave aggressively.
   g. I've seen {#Name} behave submissively.
   h. There is a give-and-take in my relationship with {#Name}.
   i. {#Name} protects me.
   j. {#Name} initiates play with me.
   k. I've seen {#Name} mad.
   l. I've seen {#Name} sad.
   m. I've seen {#Name} scared.
   n. I've seen {#Name} happy.
   o. I've seen {#Name} playful.
   p. {#Name} seeks attention from me.
   q. {#Name} communicates with me through sounds. (example: barks, whines)
   r. {#Name} communicates with me through physical gestures. (example: forcing their nose under your arm)
   s. {#Name} is responsive to my moods.
   t. {#Name} gives back to me at least as much as I give to him/her.
        i. Response set: Never, Seldom, Sometimes, Often, Always

10. How old is {#Name}?
   a. 12 months or younger = directed to question #11, then #13

b. 13 months or older = directed to question #12, then to #13

11. Approximately how old (in months) is {#Name}?

12. Approximately how old (in years) is {#Name}?

13. What breed is {#Name}?
    a. Pure breed, please identify the breed...
    b. Mixed breed
    c. I do not know

14. Approximately, how long has {#Name} lived with you?
    a. Less than one year
    b. 1 year
    c. 2 – 5 years
    d. 6 – 10 years
    e. 10 or more years

15. Where does {#Name} spend *most* of his/her days?
    a. Outside the house on a chain or trolley
    b. Outside the house in a fenced area
    c. Outside the house, roaming freely
    d. Inside the house in a crate
    e. Inside the house, but with restricted access to the entire house
    f. Inside the house, roaming freely throughout the entire house
    g. Other, please explain...

16. Where does {#Name} *usually* sleep at night?
    a. Outside the house
    b. Inside the house, but not in my bedroom
    c. In my bedroom, but not in my bed
    d. In my bed
    e. Other, please explain...

17. Now that you have indicated where {#Name} usually sleeps, please indicate if this is by his/her choice?
    a. By his/her choice
    b. Not by his/her choice

18. How frequently does {#Name} follow your directions?
    a. Usually ignores the directions I give him/her
    b. Usually follows the directions I give him/her
    c. Seems to randomly follow my directions
    d. It really depends on the situation
    e. I do not know

19. What percentage of time do you *usually* take care of {#Name} (example: gives food, water), when compared to other people who may also care for him/her? That is, if you are the only caretaker, you would mark 100%, but if you share the responsibility equally with someone else, you would mark 50%.
    a. 25%
    b. 50%
    c. 75%
    d. 100%

20. To what extent have you used the following discipline methods with {#Name}? Select all that apply.
    a. I swat/strike {#Name}
    b. I use my voice
    c. I use nonverbal commands (e.g., hand gestures)
    d. I confine {#Name} (e.g., send to crate, small room, outside)
    e. I use rewards (e.g., treats)
    f. I ignore the behavior
    g. Other, please explain...
    h. I do not discipline {#Name}

21. How frequently does {#Name} go to a veterinarian? Select all that apply.
    a. Never
    b. Only when absolutely necessary (e.g., serious injury or illness)
    c. Only for routine vaccines
    d. Routine vaccines and anytime I have concerns about his/her health

PARTICIPANT AND HOUSEHOLD QUESTIONS:

22. What is your gender?
    a. Male
    b. Female

23. What is your marital status?
    a. Single
    b. Married
    c. Separated
    d. Widowed
    e. Divorced
    f. Live with Significant Other
    g. Other, please explain...

How many people live in your household? Please indicate how many people fall into the following categories, **INCLUDING yourself**.
24. Children/Adolescent (17 years old and younger)
25. Adults (18 - 65 years old)
26. Elders (66 years and older)

a. Response set: 0,1,2,3,4,5+, Not Applicable

As a parent or legal guardian, how many of your children live in or away from your home?

27. How many of your children live in your home?
28. How many currently live away from your home?
   a. Response set: 0,1,2,3,4,5+, Not Applicable

29. What is your highest completed level of education?
   a. Some high school, no diploma or equivalency
   b. High school graduate or equivalency
   c. Some college, no degree
   d. Associate degree (e.g. AA, AS)
   e. Bachelor degree (e.g.,, BA, BS)
   f. Masters degree (e.g., MA, MS)
   g. Doctorate degree (e.g., PhD, DVM, MD)

30. How do you describe your ethnic heritage? If your preference is not on this list, please specify it in the space provided at the end of the list.
   a. African American or Black
   b. American Indian or Alaska Native
   c. Asian
   d. Asian Indian
   e. Hispanic or Latino
   f. Native Hawaiian and Other Pacific Islander
   g. White, Non Hispanic
   h. Multi-ethnic, please specify...
   i. My preference is not on this list. My preference is...

31. Which category best reflects your religious/spiritual identity?
   a. Agnosticm (i.e., existence of deities/God/gods is unknown and/or inherently unknowable) = directed to question #34, thus skipping questions #32 & #33
   b. Atheism (i.e., absence of belief or do not believe in existence of deities/God/god) = directed to question #34, thus skipping question #32 & #33
   c. Buddhism
   d. Christianity
   e. Hinduism
   f. Islam
   g. Judaism
   h. Spiritual (i.e., a personalized relationship in a deity/God/gods/belief system) = directed to question #34, thus skipping questions #32 & #33
   i. Other, please specify... = directed to question #34, thus skipping questions #32 & #33

32. To what extent do you believe in the strict interpretation of the {#Religious} teachings? ({#Religious} represents the selection made in question #31 – c, d, e, f, g)
    a. To a great extent
    b. Somewhat
    c. Very little
    d. Not at all

33. How frequently do you practice {#Religious}? ({#Religious} represents the selection made in question #31 – c, d, e, f, g)
    a. Very frequently
    b. Frequently
    c. Occasionally
    d. Rarely
    e. Never

34. Which of the following best describes the population of your community?
    a. Less than 2,500 people
    b. 2,500 – 50,000 people
    c. More than 50,000 people

35. Which category best reflects your household annual income?
    a. Less than 10,000
    b. 10,000 – 14,999
    c. 15,000 – 19,999
    d. 20,000 – 24,999
    e. 25,000 – 29,999
    f. 30,000 – 34,999
    g. 35,000 – 39,999
    h. 40,000 – 44,999
    i. 45,000 – 49,999
    j. 50,000 – 59,999
    k. 60,000 – 74,999
    l. 75,000 – 99,999
    m. 100,000 – 124,999
    n. 125,000 – 149,999
    o. 150,000 – 199,999
    p. 200,000 or more

36. Do you currently live with members of other species? Select all that apply.
    a. Bird
    b. Cat
    c. Chicken
    d. Ferret
    e. Fish
    f. Gerbil

g. Goat
h. Guinea pig
i. Hamster
j. Horse
k. Snake
l. Other, please specify...
m. I do not live with a member of another species

37. How old were you when you remember *first* caring about a dog in your family?

38. Have you ever experienced intense fear, helplessness, or horror as a result of *any HUMAN* interaction?
    a. Yes
    b. No

39. Have you ever experienced intense fear, helplessness, or horror as a result of *any DOG* interaction?
    a. Yes
    b. No

40. How would you characterize your *overall* experiences with dogs?
    a. Unfavorable
    b. Neutral
    c. Favorable

41. Thank you so much for your time. I would appreciate receiving any of your additional thoughts, comments, and/or feedback about this survey and/or its topic.

Appendix O

Invitational Email

SUBJECT LINE: Studying People and their Dogs at UT-Knoxville

Hello,

For those who do not know me, my name is Tracy Zaparanick. I am Ph.D. Candidate at the University of Tennessee - Knoxville, College of Social Work. I need your help to complete my dissertation research that examines relationships between people and their dogs.

- Are you 18 years or older?
- Do you live in the United States?
- Do you currently have at least one dog who lives inside, or outside, your home and for whom you are responsible at least some of the time?

If you did not say yes to all three of the above questions or are unable to participate, you could still help by forwarding this invitation to one or more people you know who do qualify.

If you said yes to all three of the above questions, I hope you will participate in my study. By answering about 15 minutes worth of questions about yourself, your dog, and your relationship with your dog, you will contribute to this study that seeks to understand more about relationships between people and their dogs.

To complete the survey, click on the following link or copy and paste this link into your browser:
http://survey.utk.edu/mrIWeb/mrIWeb.dll?I.Project=LAPSFINAL

As a thank you for your time and participation, I am offering you a chance to win one of four $25.00 PetSmart gift cards by completing the entire survey and submitting your email address at the end of the survey. The drawing will take place on or about May 30, 2007.

Tracy Zaparanick
Principal Investigator
tzaparan@utk.edu
Ph.D. Candidate
University of Tennessee College of Social Work
313 Henson Hall
Knoxville, TN 37996-3333

To complete the survey, click on the following link or copy and paste this link into your browser:
http://survey.utk.edu/mrIWeb/mrIWeb.dll?I.Project=LAPSFINAL

Appendix P

Welcome Page

Welcome to the Lexington Attachment to Pets Scale Study

Thank you for your interest in this study! The purpose of my project is to understand more about the relationships between people and their dogs. By answering questions about yourself, your dog, and your relationship with your dog, you will help me in meeting this goal.

I am seeking people who fall into *all three* of the categories below to participate. Please complete this survey only once.

- 18 years or older, and
- Live in the United States, and
- Have at least one dog who lives inside, or outside, your home and for whom you are responsible at least some of the time.

Another way to help is to invite other people you know, including those in your household, who fall into *all three* of these categories to participate in this project. Just forward the email invitation you received, making certain the survey link is included. This survey will end on May 9, 2007.

Appendix Q

Study Information Sheet

Study Information Sheet
Lexington Attachment to Pets Scale Study
(please print for future reference)

INTRODUCTION

Thank you for participating in my research study. The purpose of my project is to understand more about the relationships between people and their dogs. By answering questions about yourself, your dog, and your relationship with your dog, you will help me in meeting this goal.

INFORMATION ABOUT PARTICIPANTS' INVOLVEMENT IN THE STUDY

- By submitting responses, you are indicating your consent to participate.
- Survey requires approximately 15 minutes to complete.
- Should you receive multiple invitations, *please complete the survey only once.*
- To advance to the next page in this survey, click on the "Next" button.

When completing this survey online, you will need to start and finish the survey in one sitting. If you close the survey's window before finishing, your responses will be lost, requiring you to start at the beginning.

RISKS

The only foreseeable risk is to your anonymity if you submit your email address for the drawing; your participation could then become known. However, please note that email addresses will be placed in a password-protected file immediately after the data are downloaded, thereby eliminating the link to data. Email addresses will not be sold or shared with anyone or any group.

BENEFITS

By participating, you will be contributing to a body of knowledge focused on the relationships between people and their dogs. Additionally, participation helps this researcher fulfill requirements for the degree of Doctor in Philosophy, with a major in Social Work.

CONFIDENTIALITY

Your responses will remain anonymous and confidential. Only this researcher and consultants (e.g., UT Student Statistical Consulting Center and my Dissertation Committee) will have access to the raw data.

COMPENSATION

The only compensation for participation is the chance to win one of four $25.00 PetSmart gift cards by completing the entire survey and submitting your email address at the end of the survey. The drawing will take place on or about May 30, 2007.

CONTACT

If you have questions at any time about the study or the procedures, you may contact the researcher, Tracy Zaparanick, at the University of Tennessee, Knoxville, College of Social Work, 313 Henson Hall, Knoxville, TN 37996-3333, or tzaparan@utk.edu. If you have questions about your rights as a participant, contact the Office of Research Compliance Officer at (865) 974-3466.

PARTICIPATION

Your participation in this study is voluntary, you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at anytime without penalty and without loss of benefits to which you are otherwise entitled. Submission of the completed survey constitutes your consent to participate.

If you agree to participate, press the "Next" button below to begin.

Appendix R

Ineligible Notification Page

Thank you again for your interest in this study. According to your response, you do not meet one of the three below criterion or, you have declined to answer one of the critical questions. However, you could still help by passing along this study's link to others you know who do qualify.

- 18 years or older, and
- Live in the United States, and
- Have at least one dog who lives inside, or outside, your home and for whom you are responsible at least some of the time.

Your time has been greatly appreciated!

Appendix S

Email Requested for Gift Card Drawing Page

If you would like to enter into the drawing for one of the four $25.00 PetSmart gift cards, please provide your email address below. If you win one of the cards, I will contact you to find out how best to get the gift card to you.

Appendix T

Household Human Occupants Demographics Summary

Appendix T
Group and Sample State Household Occupants Demographics Summary

Characteristic	Original	Personalized	Total
	n (group %)	*n* (group %)	*n* (sample %)
Ages 0-17			
0	1460 (78.7%)	1440 (77.9%)	2900 (78.3%)
1	186 (10.0%)	212 (11.5%)	398 (10.7%)
2	146 (7.9%)	133 (7.2%)	279 (7.5%)
3	43 (2.3%)	37 (2.0%)	80 (2.1%)
4	15 (.8%)	18 (.9%)	33 (.9%)
5+	2 (.1%)	7 (.4%)	9 (.2%)
Ages 18-65			
0	118 (6.4%)	103 (5.6%)	221 (6.0%)
1	482 (26.0%)	474 (25.6%)	956 (25.8%)
2	1069 (57.7%)	1081 (58.5%)	2150 (58.0%)
3	144 (7.8%)	137 (7.4%)	281 (7.6%)
4	32 (1.7 %)	41 (2.2%)	73 (2.0%)
5+	7 (.4 %)	10 (.5%)	17 (.4%)
Ages 66+			
0	1701 (91.7%)	1691 (91.4%)	3392 (91.6%)
1	111 (6.0%)	130 (7.0%)	241 (6.5%)
2	40 (2.2%)	26 (1.4%)	66 (1.8%)
3	1 (.0%)	-	1 (.0%)
Children In Home			
0	1359 (7.3%)	1354 (73.2%)	2713 (73.3%)
1	231 (12.5%)	238 (12.9%)	469 (12.7%)
2	159 (8.6%)	167 (9.0%)	326 (8.8%)
3	53 (2.8%)	38 (2.0%)	91 (2.4%)
4	12 (.6%)	16 (.9%)	28 (.8%)
5+	2 (.1%)	5 (.3%)	7 (.2%)
Not applicable	36 (1.9%)	28 (1.5%)	64 (1.7%)
Children Not at Home			
0	1330 (71.7%)	1283 (69.4%)	2613 (70.6%)
1	185 (10.0%)	180 (9.7%)	365 (9.8%)
2	172 (9.3%)	212 (11.5%)	384 (10.4%)
3	75 (4.0%)	89 (4.8%)	164 (4.4%)
4	30 (1.6%)	30 (1.6%)	60 (1.6%)
5+	16 (.9%)	20 (1.1%)	36 (9.7%)
Not applicable	44 (2.4%)	33 (1.8%)	77 (2.1%)

Note: All data are based solely on valid responses; that is, missing data are excluded.
This accounts for the variation in the presented n values. Percentages are rounded,
therefore they may fail to equal or exceed 100%.

Appendix U

Group and Sample State Distribution

Appendix U
Group and Sample State Distribution

State	Original	Personalized	Total
	n	*n*	*n*
District of Columbia	14	7	21
AL	64	59	123
AK	9	8	17
AZ	59	54	113
AR	12	17	29
CA	143	143	286
CO	28	28	56
CT	8	10	18
DE	5	3	8
FL	67	71	138
GA	59	53	112
HI	4	3	7
ID	8	6	14
IL	50	52	102
IN	23	11	34
IA	10	10	20
KS	27	27	54
KY	79	91	170
LA	8	7	15
ME	20	16	36
MD	43	55	98
MA	27	31	58
MI	41	44	85
MN	17	17	34
MS	6	11	17
MO	38	41	79
MT	1	2	3
NE	9	11	20
NV	7	4	11
NH	7	9	16
NJ	52	52	104
NM	18	14	32
NY	40	54	94
NC	82	60	142
ND	2	-	2
OH	59	71	130
OK	7	12	19
OR	74	71	145

Appendix U, continued

State	Original	Personalized	Total
	n	*n*	*n*
RI	3	5	8
SC	27	26	53
SD	2	1	3
TN	256	275	531
TX	50	49	99
UT	16	6	22
VT	4	6	10
VA	63	55	118
WA	63	56	119
WV	11	14	25
WI	19	15	34
WY	7	3	10

Note: All data are based solely on valid responses; that is, missing data are excluded. This accounts for the variation in the presented n values. Percentages are rounded, therefore they may fail to equal or exceed 100%.

Appendix V

Religious Interpretation and Practice Distribution

Appendix V
Extent of Religious Interpretation and Practice

Religion	Original	Personalized	Total
	n *(group %)*	n *(group %)*	n *(sample %)*
Buddhism Interpretation	14	15	29
To a great extent	2	2	4
Somewhat	7	12	19
Very little	2	-	2
Not at all	2	-	2
Buddhism Practice			
Very frequently	4	4	8
Frequently	7	4	11
Occasionally	3	5	8
Rarely	-	2	2
Never	-	-	-
Christianity Interpretation	990	1015	2005
To a great extent	307	301	608
Somewhat	403	446	849
Very little	181	181	362
Not at all	40	40	80
Christianity Practice			
Very frequently	318	325	643
Frequently	281	324	605
Occasionally	246	244	490
Rarely	84	81	165
Never	8	6	14
Hinduism Interpretation	-	2	2
To a great extent		-	-
Somewhat		-	-
Very little		2	2
Not at all		-	-
Hinduism Practice			
Very frequently		-	-
Frequently		-	-
Occasionally		1	1
Rarely		1	1
Never		-	-

Appendix V, continued

Religion	Original	Personalized	Total
	n (group %)	*n* (group %)	*n* (sample %)
Judaism Interpretation	49	54	103
To a great extent	3	1	4
Somewhat	20	18	38
Very little	22	31	53
Not at all	3	3	6
Judaism Practice			
Very frequently	2	1	3
Frequently	10	6	16
Occasionally	21	31	52
Rarely	14	15	29
Never	-	1	1

Note: All data are based solely on valid responses; that is, missing data are excluded. This accounts for the variation in the presented n values. Percentages are rounded, therefore they may fail to equal or exceed 100%.

Appendix W

Modified SEM Model
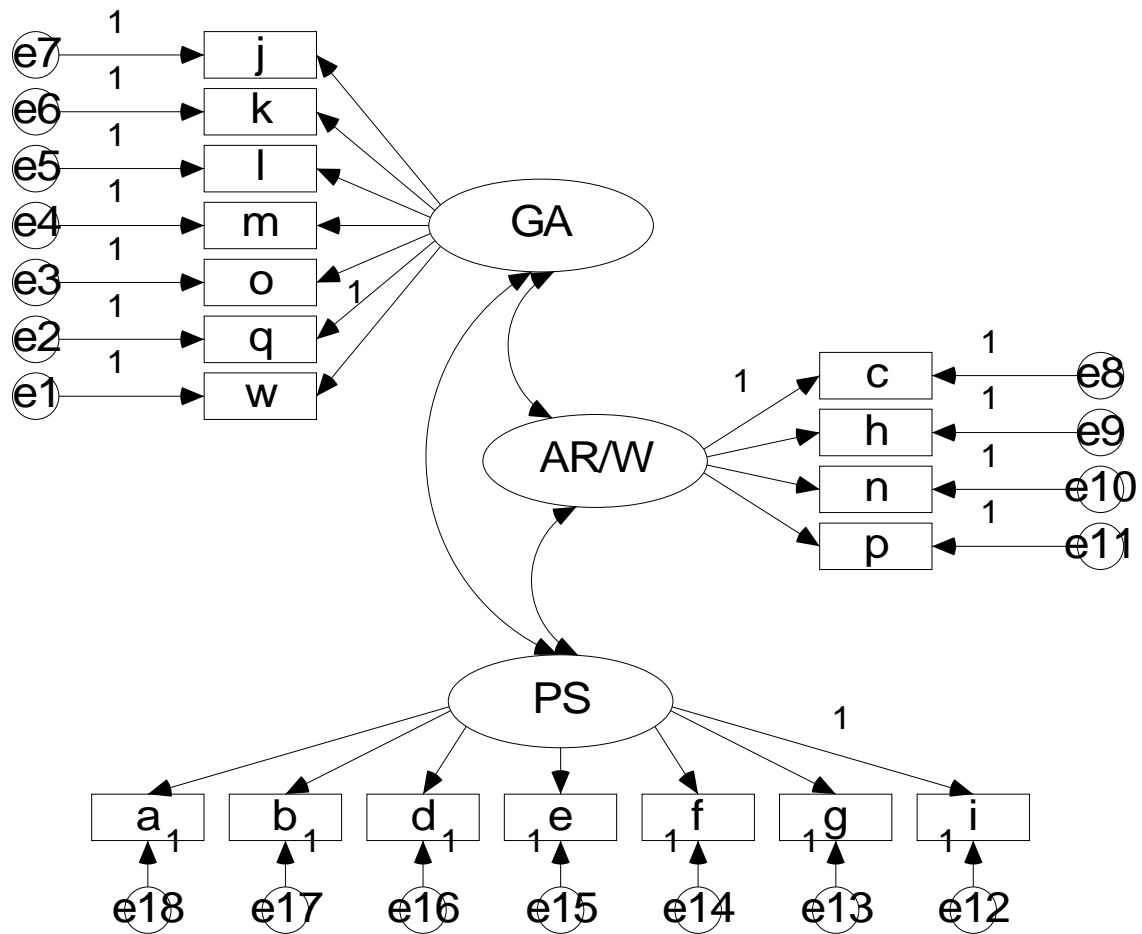
* See Appendix M for SEM Legend

Tracy L. Zaparanick has been a Licensed Clinical Social Worker for over 12 years. Her social work career began with the fulfillment of her Bachelor of Arts in Social Work degree at the University of Kentucky in December 1989. In order to achieve her goal of licensure, she enrolled at the University of Louisville to obtain her Master of Science in Social Work degree, conferred in December 1992. In 1995, she earned clinical licensure through the state of North Carolina.

By this time, Tracy had worked in an in-patient mental health and substance abuse treatment facility in Lexington, Kentucky, fulfilling the role of individual therapist and leading group activities/therapies with adolescents. Then, she worked briefly as a therapist for a rural community mental health center in Georgetown, Kentucky. In December 1992, she moved to Charlotte, North Carolina, to take a position as an in-patient psychotherapist to facilitate individual, family, and group therapies for the adolescents and their families, along with case management tasks.

During the tenure of this job, she began her volunteer work with the American Red Cross as a disaster mental health volunteer. Her involvement with the International Critical Incident Stress Foundation was a result of this volunteer work. Tracy is now an approved instructor for two of its Critical Incident Stress Management courses: (1) Group Interventions and (2) Assisting Individuals in Crisis.

Leaving the in-patient setting and over the next two years, Tracy worked in an adolescent day treatment program as a program therapist and then as a clinical social worker for a contracting agency for numerous facilities. This agency provided diagnostic and mental health services to long-term care and acute-care facility residents.

After identifying a new clinical focus and career goal, Tracy worked part-time for two years as a veterinary assistant for a small animal hospital in Charlotte, North Carolina, in order to become familiar with health care issues with other species. At the same time, she worked for a day treatment program for adults diagnosed as severely and persistently mentally ill.

The opportunity for a new career direction came with the acceptance of the healthcare professional position at Tuskegee University School of Veterinary Medicine within their new Center for the Study of Human-Animal Interdependent Relationships. In order to maintain clinical skills, Tracy worked part-time in an adult in-patient mental health facility in Montgomery, Alabama. While at Tuskegee, she received a grant to begin investigating compassion fatigue within professions that work with members of other species, an unprecedented study.

The experience of this research project prompted the enrollment at The University of Tennessee – Knoxville College of Social Work Ph.D. program. While completing coursework for this Ph.D. program, she assisted in the development of Veterinary Social Work, a collaborative venture between the College of Social Work and the College of

Veterinary Medicine. She also worked as a graduate teacher assistant in the College of Social Work. She continued her graduate research assistantship within the College of Veterinary Medicine Department of Comparative Medicine by leading various research projects as identified by this College.

Most recently, Tracy has taken the position of an Employee Assistance Program counselor in Knoxville, Tennessee. For the past seven years, Tracy has conducted numerous national, regional and local presentations (e.g., compassion fatigue, crisis intervention) for organizations such as the Humane Society University (Humane Society of the United States).