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In the Eyes of the Beholder: Pet Owners' Attitude Toward Animals and Perception of Their Pet's
Behavior

by

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of the requirements for the degree of
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Abstract

The present study examined the relationship between cat and dog owners' attitude toward animals and perception of their pet's behavior. Owner attitudes can affect the owner-pet dyad with either positive or negative outcomes, influencing the success of the relationship. Sixty-six cat owners and 90 dog owners completed an online questionnaire that included an assessment of pet owners' pro-animal welfare attitude (measured by the Animal Attitude Scale) and an assessment of pet behavior in regard to aggression, trainability, and separation-related behaviors. Inclusion criteria included adults who currently owned either a cat or dog that was at least six months old at the time of participation. The results did not demonstrate a relationship between attitude toward animals and pet owner behavior ratings. Factors such as low behavior scores potentially affected study results and warrant further investigation. However, the results do indicate that gender and previous pet ownership are related to a person's attitude toward animals. Differences between cat and dog owners' behavior ratings are also discussed.

Keywords: attitude toward animals, dog, cat, pet owner, empathy, behavior, perception

In the Eyes of the Beholder: Pet Owners' Attitude Toward Animals and Perception of Their Pet's Behavior

Sixty-five percent of U.S. households own pets, including 85.8 million domestic cats (*Felis catus*) and 77.8 million domestic dogs (*Canis lupus familiaris*) (American Pet Products Association, 2015-2016). Many humans share a dyadic relationship with their cat or dog, viewing their pet as a social companion. A poll of pet owners residing in the United States found that 95% of respondents considered their pet to be a member of the family (Shannon-Missal, 2015).

The nature of the human-pet relationship can impact the quality of life for both the pet owner and the pet. Dysfunctional relationships may lead to physiological stress, inappropriate pet behavior, aversive training methods, and re-homing of the pet. In a cross-sectional telephone survey of U.S. pet owners, Weiss, Gramann, Spain, and Slater (2015) found that 46% of pets were re-homed due to a problem with the pet rather than family or housing problems, while 76% of individual pet problems were related to behavior problems such as aggression and destruction. Pets re-homed due to a pet problem were most often relinquished to a shelter or veterinarian (Weiss, Gramann, Spain, & Slater, 2015). Owner relinquished animals make up at least one third of the 7.6 million companion animals entering animal shelters each year in the United States (American Society for the Prevention of Cruelty to Animals, n.d.-b). Once in the shelter system, animals face the risk of being euthanized. Approximately 1.4 million cats and 1.2 million dogs are euthanized each year (American Society for the Prevention of Cruelty to Animals, n.d.-b).

A greater understanding of the mechanisms involved in human-pet relationships can be used to make appropriate matches between potential pet owners and animals and develop training programs for dysfunctional relationships. Identifying human attributes related to the

human-pet dyad can help foster a healthy, functioning relationship, increasing the likelihood that a pet stays with its owner.

An attitude or “mind-set” is considered an evaluative reaction to an object or situation exhibited in feelings, beliefs, and/or behavior (Olson & Zanna, 1993). Attitudes help a person make sense out of life, informing his or her point of view and guiding individual choices and decisions. Formed through a person’s experiences and socialization process, attitudes are influenced by an individual’s motivations, values, and temperament (Pickens, 2005). “Attitude toward animals” is a term generally understood to include attitudes related to animal welfare and concern for quality of life in regard to human-animal interactions, animal use, and humane treatment of animals.

Previous studies demonstrated that a person’s attitude toward animals is associated with psychological factors such as belief in animal mind, which Hills (1995) defines as “...belief about the extent to which animals are similar to humans in having awareness, thoughts, and feelings” (p. 134). Knight, Vrij, Cherryman, and Nunkoosing (2004) found belief in animal mind to be a powerful and consistent predictor of attitudes toward animal use, hypothesizing that an increase in public awareness regarding animal cognition plays a role in the predictor’s strength.

In a study involving animal rights supporters, farmers, and urban community members, Hills (1993) provided empirical support for a tripartite model defining the fundamental motivations behind attitude toward animals, including instrumental motivations (related to the use of animals and influenced by individual experiences with animals), value-expressive motivations (related to the beliefs and values one has about the nature and status of animals), and identification/empathic motivations (related to one’s awareness of an animal’s point of view). In order to validate the identification/empathic motivational base, Hills (1993) utilized emotion-

eliciting scenarios to measure participants' emotional responses and level of empathic concern for target animals, which resulted in a generalized empathy index exhibiting a Cronbach alpha value of .96.

Recent definitions describe empathy as a multidimensional construct with both cognitive (mental perspective taking) and affective (emotional) components (Eisenberg & Strayer, 1987). Thus, empathy refers to the capacity to understand as well as share in someone's emotional experience. Understanding someone's emotions is key to understanding his or her intentions and behavior, helping to create positive interactions (Ellingsen, Zanella, Bjerkas, & Indrebo, 2010).

Plutchik (1987) places empathy in an evolutionary context in that it serves to bond individuals to each other, an important survival mechanism that also contributes to inclusive fitness. As such, empathy allows for fast, automatic emotional connectedness, essential for the regulation of social interactions (de Waal, 2008). Zahn-Waxler, Hollenbeck, and Radke-Yarrow (1984) posit that similarities in the expression of shared characteristics (such as distress) across different species serve as a biological mechanism in which humans recognize that other species share similar needs to their own, promoting an empathic response across species. Hills (1995) provided evidence for a relationship between empathy and belief in animal mind, demonstrating that perceived similarity predisposes individuals to experience empathy. For urban community members, belief in animal mind was a unique, significant predictor of empathy (Hills, 1995).

Several studies provide empirical evidence for a relationship between attitude toward animals and empathy. Apostol, Rebegea, and Miclea (2013) found significant correlations between a person's belief in animal mind, capacity to empathize with animals, and attitude toward animals, hypothesizing that belief in animal mind facilitated the perspective taking process, in turn leading to empathic concern. In a study measuring empathy and attitude toward

animals, Taylor and Signal (2005) demonstrated that participants who scored higher in empathic concern held higher pro-welfare attitudes toward animals. Utilizing the Attitudes Toward the Treatment of Animals Scale, Erlanger and Tsytsarev (2012) found that participants with high levels of empathy held more positive attitudes toward animals and experienced higher levels of discomfort regarding animal cruelty and utilitarian use of animals.

Empathy is also believed to be a major determinant of altruism. The empathy-altruism hypothesis contends that feelings of empathy toward an individual evoke a true altruistic motivation to increase the individual's welfare (Batson & Shaw, 1991). The empathy-altruism mechanism, coined the 'perception-action mechanism' by de Waal (2008), "automatically and unconsciously activates neural representations of states in the subject similar to those perceived in the object" (p. 282), leading to an altruistic impulse. de Waal (2008) asserts that the empathy-altruism mechanism works so well precisely because of the emotional stake one has in the welfare of another. In order to adopt someone's perspective, the perceiver must have the ability to imagine how a person is affected by his or her situation, possibly by recalling prior experiences in similar situations or invoking feelings of attachment toward the individual (Batson & Shaw, 1991).

Studies conducted over the last several decades provide evidence to support the empathy-altruism hypothesis. Batson et al. (1988) carried out five studies in which egoistic alternatives to the empathy-altruism hypothesis were tested, including the empathy-specific reward hypothesis (prosocial motivation directed toward self-rewards, such as honor or pride) and the empathy-specific punishment hypothesis (prosocial motivation directed toward avoiding social or self-punishments, such as guilt or shame). Results from all five studies provide evidence for the claim

that empathic concern evokes altruistic motivation, despite the use of varying need situations and different empathy-provoking techniques (Batson et al., 1988).

Batson (2011) distinguishes altruism as a motivational state rather than an aspect of a person's disposition. Characterized by empathy, altruism focuses on benefiting another rather than oneself. With the use of functional magnetic resonance imaging, Moll et al. (2006) found that human altruism is associated with the general mammalian neural systems of social attachment, reward, and aversion. More specifically, altruistic behavior activated the subgenual area of the brain, which plays a fundamental role in controlling neural functions involved with social attachment and the release of oxytocin, a neuromodulator considered integral to the mechanisms involved in positive social interactions (Moll et al., 2006; Uvnas-Moberg, 1998). The mutual gaze associated with human-dog interactions is known to release oxytocin in both humans and dogs, producing mutually rewarding social effects and a deepening of the relationship bond (Nagasawa et al., 2015).

Indeed, social connection is considered fundamental to the healthy development of a human being. Love, affection, and belonging become primary psychological needs after physiological and safety needs are met (Maslow, 1943). Seppala, Rossomando, and Doty (2013) define social connection as "a person's subjective sense of having close and positively experienced relationships in the social world" (p. 412). Relationships have the potential to provide a person with love and a sense of belonging.

In a study examining the role of pets in the family network, Bonas, McNicholas, and Collis (2000) demonstrated that human-pet relationships share a similar social structure to human-human relationships in terms of social provisions such as companionship, nurturance, and reliance. Often times, pets serve as effective social resources for their owners, alleviating the

negativity that results from social loneliness and rejection (McConnell, Brown, Shoda, Stayton, & Martin, 2011). Participants from a study conducted by Staats, Wallace, and Anderson (2008) responded that the number one reason they obtained a pet was to avoid feeling lonely.

McConnell, Brown, Shoda, Stayton, and Martin (2011) suggest that pets contribute to the fulfillment of social needs independent of a person's human social support network. Pet relationships have the potential to provide pet owners with a consistent sense of relationship security, often surpassing that which is experienced in romantic human-human relationships (Beck & Madresh, 2008).

Within social support research, emotional connection emerges as a critical component of social connection (Seppala, Rossomando, & Doty, 2013). Empathic concern and altruistic motivation are increased by imagining what a person is feeling, thereby reducing social bias and increasing coordination of social behavior (Batson et al., 2003; Galinsky, Ku, & Wang, 2005). Davis, Conklin, Smith, and Luce (1996) found that perspective taking led participants to assign a greater number of positive attributes to individuals they did not know, viewing them in a more positive light. Galinsky and Moskowitz (2000) corroborated these results by demonstrating that perspective taking increased positive evaluations of a social target (Galinsky & Moskowitz, 2000). Positive emotions can be seen as social resources that serve to strengthen social bonds (Fredrickson, 2003).

The purpose of the following research was to identify the relationship between a pet owner's attitude toward animals and perception of their pet's behavior. An owner's perception can impact the dyadic relationship with positive or negative results, as an individual's behavior is often based on his or her perception of what reality is rather than reality itself (Coutts & Gruman, 2012). Sixty-six cat owners and 90 dog owners completed an online questionnaire that included

owner and pet demographic questions, an assessment of the pet owner's attitude toward animals, and an assessment of the pet's behavior. It was hypothesized that pet owners exhibiting a higher pro-animal welfare attitude would view their pet's behavior more positively. The study included an exploratory analysis of the association between certain owner characteristics (i.e. owner gender, species owned, previous training experience, and previous ownership) and pet owners' attitude toward animals.

Method

Participants

A self-selecting sampling method was used in which interested pet owners volunteered to participate in the research study by following a web link listed on the study recruitment announcement ([see Appendix A](#)). In order to disseminate the questionnaire as widely as possible and secure a diverse participant pool, the recruitment announcement was posted on social media sites Facebook and Twitter and the following psychology research sites: Psychology Research on the Net (<http://psych.hanover.edu/research/exponnet.html>), In Mind (<http://www.in-mind.org/content/online-research>), and PsychResearch.org (<http://psyresearch.org/online>).

To participate in the current study, pet owners had to be at least 18 years old (for consent purposes) and currently own a cat or dog that was at least six months old at the time of participation, since the behavior assessment tools were not validated for younger cats and dogs. Twenty-one cat owners and 37 dog owners failed to answer any of the questions in the attitude toward animals section and/or the behavior assessment section of the survey and were therefore excluded from analysis.

Sixty-six adult cat owners (58 female, 8 male) and 90 adult dog owners (69 female, 20 male, 1 unknown) participated in the study. Pet owners ranged in age from 18 to 77 years old (M

= 38.71, *SD* = 17.03) and primarily resided in the northeast region of the United States. The vast majority of pet owners lived with more than one pet at the time of the study, including cats, dogs, and other animals. For the purpose of the present study, participants who owned multiple pets were asked to base their responses on only one cat or dog throughout the survey.

Both cat and dog owners reported a high rate of previous pet ownership during childhood and/or adulthood. Pets were primarily kept for companionship. A greater number of dog owners than cat owners had previous training experience. Table 1 provides a summary of pet owner demographic characteristics.

Table 1

Cat and Dog Owner Demographic Characteristics

Characteristic	Cat Owners (%)	Dog Owners (%)
Geographic residence^a		
Northeast	50%	34%
Midwest	17%	17%
South	8%	19%
West	8%	18%
Hawaii	1%	1%
Overseas	15%	10%
Unknown	1%	1%
Own more than one pet	100%	98%
Previous pet ownership		
Yes	85%	79%
No	15%	20%
Unknown	-	1%
Previous training experience		
Yes	17%	49%
No	83%	51%
Purpose for pet		
Companionship	79%	97%
Other (pest control, service, etc.)	18%	3%
Breeding	2%	-
Guarding	1%	-

^aGeographic residence in the United States based on U.S. Census Bureau regions.

Participants identified 12 cat breeds and 33 dog breeds, with “domestic shorthair” (35%) reported as the most common cat breed and “mixed breed” (28%) as the most common dog breed (see [Appendix B](#) for a complete list of participant cat and dog breeds). A higher percentage of dog owners (34%) than cat owners (8%) hoped their pet would display breed-specific behaviors. Table 2 provides additional cat and dog demographic characteristics.

Table 2

Cat and Dog Demographic Characteristics

Characteristic	Cats	Dogs
Gender (by percentage)		
Female	35%	37%
Male	62%	63%
Unknown	3%	-
Age ^{ab}	1-16 ($M = 7.73, SD = 4.30$)	0.5-16 ($M = 5.90, SD = 3.73$)
Length of ownership ^{ab}	<1-15 ($M = 6.56, SD = 4.35$)	<1-16 ($M = 5.09, SD = 3.60$)

^aRange, mean, and standard deviation provided. ^bAge and length of ownership represented in years.

Measures

Cat and dog owners’ attitude toward animals was measured using the Animal Attitude Scale (Herzog, Betchart, & Pittman, 1991). This 20-item scale captures general attitudes toward the treatment and use of animals. Previous studies utilized the Animal Attitude Scale to investigate attitudes toward animal welfare issues and other aspects of human-animal interactions (Herzog, Grayson, & McCord, 2015). Participants responded to statements on a 5-point Likert-type scale ranging from 1- “*Strongly Disagree*” to 5- “*Strongly Agree*”. Sample items included “It is morally wrong to hunt wild animals for sport”, “Much of the scientific research done with animals is unnecessary and cruel”, and “It is unethical to breed purebred dogs for pets when millions of dogs are killed in animal shelters each year”. The Animal Attitude Scale previously demonstrated high internal consistency, with Cronbach’s alphas ranging from

0.85 to 0.95 (Herzog et al., 2015). A pet owner's attitude toward animals score (attitude score) was calculated by summing his or her responses to the 20 statements included in the scale.

Cat and dog behaviors were measured using excerpts from the Feline Behavioral Assessment and Research Questionnaire (Fe-BARQ; J. A. Serpell, personal communication, January 28, 2016) and the Canine Behavioral Assessment and Research Questionnaire (C-BARQ; Hsu & Serpell, 2003), respectively. Both behavior questionnaires were designed to provide pet owners and professionals with standardized evaluations of cat and dog temperament and behavior. C-BARQ behavior categories previously demonstrated internal consistency, with Cronbach's alphas ranging from 0.7 to 0.9 (Hsu & Serpell, 2003). Per Serpell (personal communication, May 30, 2016), Fe-BARQ Cronbach's alphas will be reported in a forthcoming study.

For the purpose of the current research study, three shared behavior categories were examined: aggression (owner-directed and stranger-directed), trainability, and separation-related behavior. Each behavior category consisted of 3-18 statements from the Fe-BARQ or C-BARQ describing typical cat or dog responses to common stimuli in the environment. Behavior categories rated either the intensity or frequency of behaviors, utilizing 5-point Likert-type scales. Frequency scales ranged from 0-*Never* to 4-*Always*; while intensity scales ranged from 0-*No visible signs of aggression* to 4-*Severe Aggression*. Pet owners also had the option to choose *Unknown* or *Not Observed*. *Unknown* and *Not Observed* responses were recorded as missing values. Per Fe-BARQ/C-BARQ instructions, if more than 25% of questions in a particular behavior category were missing values, the behavior score for that category was not calculated. Aggression, trainability, and separation-related behavior scores were calculated by averaging the responses within each behavior category.

Sample Fe-BARQ and C-BARQ questionnaire items encompassed various aspects of aggression (e.g. “Growls/hisses when an unfamiliar [non-household] person tries to touch or pet him/her”, “Lashes out [scratches, bites] unexpectedly when petted”), trainability (e.g. “Readily responds to simple commands [out, in, quiet, down, up, no, lie down, etc.]”, “Easily distracted by interesting sights, sounds, or smells”), and separation-related behaviors (e.g. “Shows restlessness, agitation, and/or pacing when you or another household member prepares to leave the home”, “Chewing/scratching at doors, floor, windows, curtains, etc.”).

Participants provided actual and ideal pet behavior assessments for each of the three behavior categories. Actual behavior assessments were based on actual pet behavior witnessed by the owner in the recent past (i.e. the last several months). Ideal behavior assessments were based on how a pet owner’s ideal pet would behave (i.e. how the perfect or most suitable pet would behave). A difference score was then calculated for each behavior category based on the difference between the actual behavior score and the ideal behavior score. The difference score was utilized as a measure of the pet owner’s perception, providing insight into potential areas of conflict in the relationship. Comparable procedures were used in previous studies to obtain cat and dog owner behavior assessments (Serpell, 1996; Turner & Stammbach-Geering, 1990).

Procedure

The current study utilized two online questionnaires to collect participant data. Separate cat and dog owner questionnaires were created to account for the different behavior questions between the two species (see [Appendices C and D](#)). Empirical comparisons between online data collection and more traditional forms of data collection demonstrate that internet-based findings are not typically corrupted by false data or repeat responders, and produce results consistent with

traditional methods (Gosling, Vazire, Srivastava, & John, 2004). Data was collected via the survey software tool SurveyMonkey (<https://www.surveymonkey.com/>).

Participants provided consent in the form of an electronic signature and had the option to skip questions they did not want to answer. Due to a greater number of behavior questions in the dog owner questionnaire, dog owners averaged longer completion times (6-8 minutes) compared to cat owners (5-7 minutes). No direct contact occurred between the researcher and study participants at any time during the study, nor did the researcher collect sensitive personal information from participants, such as name and email address. The survey remained open to pet owners from March 4 to May 18, 2016. Study participation did not include compensation or other remuneration. The research study received ethics clearance through the University Institutional Review Board.

Results

Cat and Dog Owner Attitude Scores and Behavior Scores By Behavior Category

Attitude scores were calculated by summing participants' responses to the 20 statements included in the Animal Attitude Scale, with high scores indicating pro-animal welfare attitudes. Behavior scores in the aggression, trainability, and separation-related behavior categories were calculated by averaging participants' responses within each behavior category. Aggression and separation-related behavior scores were reverse-coded so that high scores in each of the three behavior categories indicated better behavior. Table 3 provides a breakdown of attitude scores and behavior scores by cat and dog owner.

Table 3

Cat and Dog Owner Attitude Toward Animals Scores and Behavior Scores By Behavior Category

	Cat Owner	Dog Owner
Attitude toward animals score ^a	48-98 (<i>M</i> = 75.10, <i>SD</i> = 11.67)	46-97 (<i>M</i> = 72.89, <i>SD</i> = 12.40)
Behavior scores ^b		
Aggression (reverse coded)		
Actual	1-4 (<i>M</i> = 3.57, <i>SD</i> = .50)	2-4 (<i>M</i> = 3.44, <i>SD</i> = .43)
Ideal	2-4 (<i>M</i> = 3.74, <i>SD</i> = .43)	2-4 (<i>M</i> = 3.69, <i>SD</i> = .34)
Difference (A-I)	-2.67-1.28 (<i>M</i> = -.17, <i>SD</i> = .54)	-1.78-.44 (<i>M</i> = -.25, <i>SD</i> = .35)
Trainability		
Actual	0-4 (<i>M</i> = 2.18, <i>SD</i> = .76)	0-4 (<i>M</i> = 2.56, <i>SD</i> = .67)
Ideal	1-4 (<i>M</i> = 2.89, <i>SD</i> = .75)	2-4 (<i>M</i> = 3.19, <i>SD</i> = .69)
Difference (A-I)	-3.67-.67 (<i>M</i> = -.71, <i>SD</i> = .96)	-3.25-1.50 (<i>M</i> = -.63, <i>SD</i> = .74)
Separation-related (reverse coded)		
Actual	0-4 (<i>M</i> = 2.86, <i>SD</i> = .87)	0-4 (<i>M</i> = 3.14, <i>SD</i> = .76)
Ideal	1-4 (<i>M</i> = 3.46, <i>SD</i> = .69)	3-4 (<i>M</i> = 3.74, <i>SD</i> = .38)
Difference (A-I)	-3.67-1.16 (<i>M</i> = -.60, <i>SD</i> = .79)	-3.50-.50 (<i>M</i> = -.60, <i>SD</i> = .75)

Note. Range, mean, and standard deviation included for all scores.

^aAttitude toward animals score based on 20 questions: minimum possible score = 20, maximum possible score = 100. ^bBehavior scores based on a five point system, ranging from 0-4. Higher scores in the actual and ideal categories indicate better behavior. Larger absolute difference scores indicate a greater potential for conflict in the human-pet relationship.

Relationship between Attitude Toward Animals and Pet Behavior Ratings

Pearson correlations were calculated to determine the relationship between pet owners' attitude toward animals and ratings of their pet's behavior. Due to the large number of comparisons conducted, a Bonferroni correction was applied to the alpha ($p \leq .002$). No significant correlations were found between attitude scores and ratings of actual and ideal behavior in the aggression, trainability or separation-related behavior categories (see Table 4). However, further analysis revealed significant associations between several behavior categories independent of attitude scores, including significant correlations between actual and ideal

behavior in each of the three behavior categories, as well as significant correlations between ideal training, ideal aggression, and ideal separation-related behavior (see Table 4).

Table 4

Summary of Correlations between Attitude Toward Animals and Aggression, Trainability, and Separation-Related Behavior Categories

	1	2	3	4	5	6	7
1. Attitude Toward Animals							
2. Actual Aggression	.04						
3. Actual Training	.02	.10					
4. Actual Separation	-.13	.12	.16				
5. Ideal Aggression	.11	.47*	.05	.03			
6. Ideal Training	-.03	.00	.35*	-.08	.25*		
7. Ideal Separation	-.03	.00	-.08	.42*	.26*	.24*	

* $p \leq .002$

Relationship between Attitude Toward Animals and Owner Demographics

A 2 x 2 analysis of variance with owner gender (female, male) and pet species (cat, dog) as between-subjects factors revealed a main effect of owner gender, $F(1, 151) = 7.92, p = .01, \eta^2 = .05$. Female pet owners ($M = 75.40, SD = 11.52$) scored significantly higher than male pet owners ($M = 67.25, SD = 12.44$) on the Animal Attitude Scale. The main effect of pet species was non-significant, $F(1, 151) = .56, p = .46, \eta^2 < .01$, indicating that cat owners ($M = 75.09, SD = 11.67$) did not significantly differ from dog owners ($M = 73.07, SD = 12.35$) in their attitude toward animals. The interaction between owner gender and pet species was non-significant, $F(1, 151) = .19, p = .67, \eta^2 < .01$.

Relationship between Attitude Toward Animals, Previous Ownership, and Previous Training Experience

A 2 x 2 analysis of variance with previous ownership (yes, no) and previous training experience (yes, no) as between-subjects factors revealed a main effect of previous ownership, $F(1, 151) = 3.84, p = .05, \eta^2 = .03$. Pet owners who previously owned a pet ($M = 74.72, SD =$

12.31) scored significantly higher than first-time pet owners ($M = 69.75$, $SD = 10.64$) on the Animal Attitude Scale. The main effect of previous training experience was non-significant, $F(1, 151) = .27$, $p = .60$, $\eta^2 < .01$, indicating that there was not a significant difference in attitude scores between owners with previous training experience ($M = 73.67$, $SD = 13.34$) and owners with no previous training experience ($M = 73.90$, $SD = 11.50$). The interaction between previous ownership and previous training experience was non-significant, $F(1, 151) = .18$, $p = .67$, $\eta^2 < .01$.

Differences Between Cat and Dog Owner Behavior Ratings

Outliers were removed for the following analysis in an attempt to normalize the distribution of behavior scores, including 17 individuals with scores greater than one and a half interquartile ranges above the third quartile. A mixed-designed analysis of variance with one between-subject factor (species) and two within-subject factors (actual/ideal behavior and behavior type [aggression, trainability, and separation-related behavior]) revealed a main effect of actual/ideal behavior, $F(1,113) = 101.26$, $p < .01$, $\eta^2 = .47$, indicating that actual pet behavior scores ($M = 2.98$, $SD = .81$) were significantly lower than ideal pet behavior scores ($M = 3.46$, $SD = .64$).

Mauchly's test indicated that the assumption of sphericity had been violated for the main effect of behavior, $\chi^2(2) = 11.93$, $p < .01$. Therefore degrees of freedom were corrected using Huynh-Feldt estimates of sphericity ($\epsilon = .93$). Results revealed a main effect of behavior type, $F(2, 210) = 105.04$, $p < .001$, $\eta^2 = .48$. Post hoc tests using the LSD correction revealed that aggression scores ($M = 3.60$, $SD = .44$) were significantly higher than both trainability scores ($M = 2.74$, $SD = .80$) and separation-related behavior scores ($M = 3.36$, $SD = .73$), indicating that each behavior category measured a different type of behavior.

Results also revealed a main effect of species, $F(1, 113) = 10.49, p < .001, \eta p^2 = .09$, in which cat behavior scores ($M = 3.14, SD = .86$) were significantly lower than dog behavior scores ($M = 3.29, SD = .69$). Without taking other factors into account, this result indicates that dogs were rated as better behaved than cats.

There was a significant two-way interaction between actual/ideal behavior and behavior type, $F(2, 226) = 16.48, p < .001, \eta p^2 = .13$. The bar chart in Figure 1 indicates that although actual behavior scores were lower than ideal behavior scores overall, the difference was least pronounced in the aggression behavior category compared to the trainability and separation-related behavior categories.

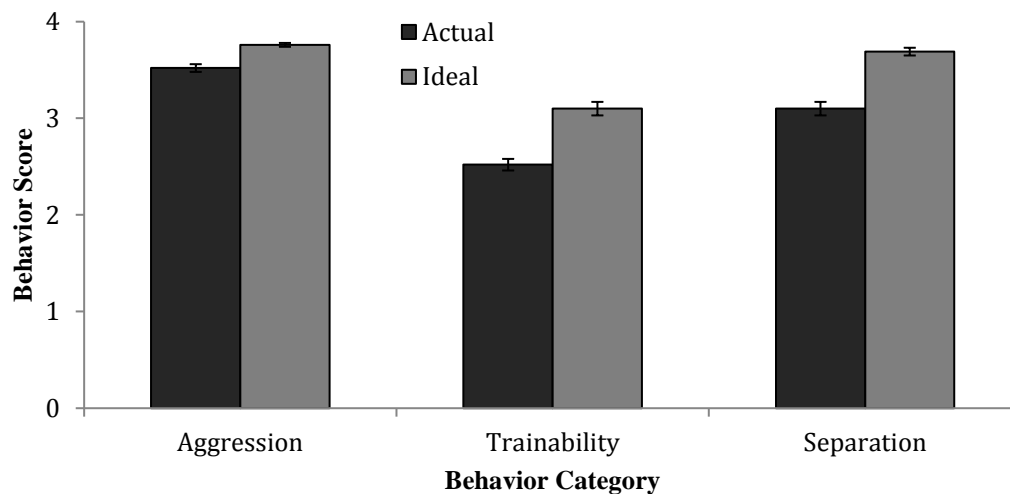


Figure 1. Comparisons of mean actual and ideal behavior scores by behavior type. Error bars represent standard error.

Results also revealed a significant two-way interaction between species and behavior type, $F(2, 226) = 7.79, p = .001, \eta p^2 = .06$. The bar chart in Figure 2 shows that dogs were rated as more trainable and displaying fewer separation-related behaviors compared to cats, while cats were rated as slightly less aggressive than dogs.

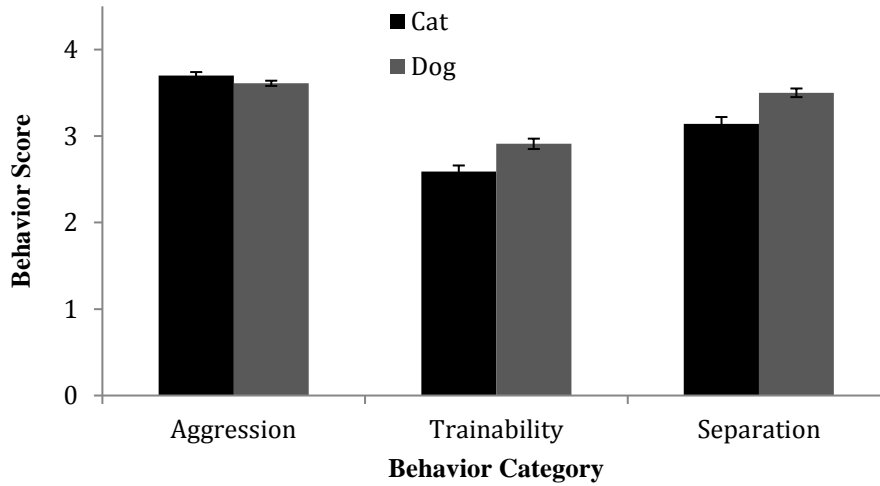


Figure 2. Comparisons of mean cat and dog behavior scores by behavior type. Error bars represent standard error.

The two-way interaction between species and actual/ideal behavior was non-significant, $F(1,113) = .02, p = .90, \eta^2 = .00$; as was the three-way interaction between species, actual/ideal behavior, and behavior type, $F(2, 224) = 1.07, p = .35, \eta^2 = .01$. Figure 3 provides a summary of actual and ideal behavior by species for each behavior type.

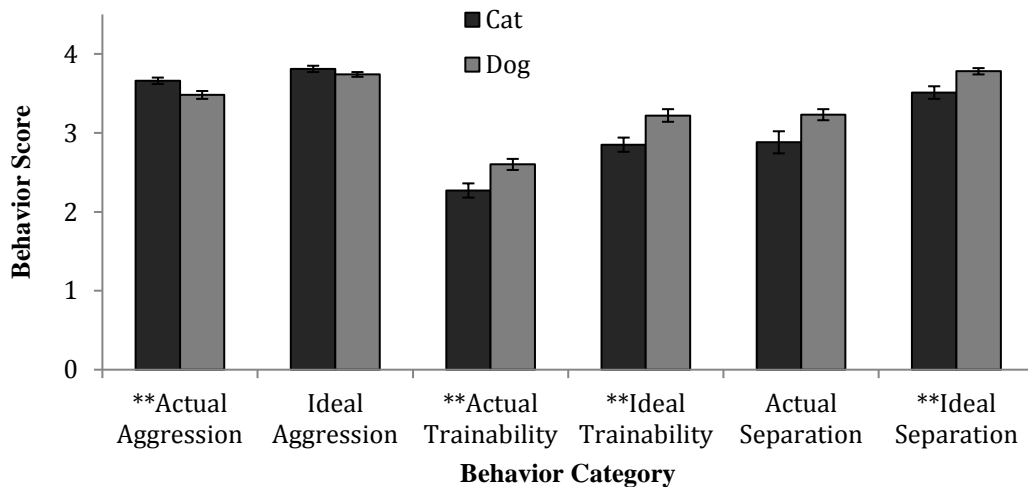


Figure 3. Comparisons of mean cat and dog actual and ideal behavior scores by behavior type. Error bars represent standard error.

* $p < .05$, ** $p \leq .01$.

Discussion

The purpose of the current research study was to identify the relationship between pet owners' attitude toward animals and perception of their companion animal's behavior. Attitudes provide a person with internal beliefs and thoughts about an object or situation, influencing his or her behavior (Pickens, 2005). The way pet owners interpret or misinterpret their cat or dog's behavior can impact owner-pet interactions and affect the success of the relationship. Contrary to the study's hypothesis, no significant correlations were found between pet owners' attitude toward animals and perception of their pet's behavior. Consistent with previous studies, results did indicate differences in pet owners' attitude toward animals based on gender and previous ownership. Differences between cat and dog owner behavior ratings were also found.

Significant correlations between actual and ideal behaviors in the aggression, trainability, and separation-related behavior categories (see Table 4) were expected as a result of the study's research design, since pet owners rated their pet's actual and ideal behavior in a given behavior category based on the same set of behavior questions. The significant correlation between ideal aggression and ideal separation-related behavior could indicate a higher tolerance for negative behavior among some of the pet owners, possibly due to previous pet experiences, varying beliefs about what constitutes negative behavior, or a person's individual temperament. The significant correlations between ideal trainability, ideal separation-related behavior and ideal aggression suggest that pet owners tend to have high or low expectations regarding their pet's behavior in general, regardless of the type of behavior, possibly due to previous pet experiences and/or varying personalities among the pet owners.

The inability to detect a relationship between pet owners' attitude toward animals and perception of their pet's behavior may be due to a variety of factors. Cat and dog owners

represent a fairly limited participant pool in that the vast majority of pet owners own their pet for the purpose of companionship. Ellingsen, Zanella, Bjerkas, and Indrebo (2010) found that a pet owner's level of empathy varied according to the purpose he or she had for keeping a pet: owners who kept pets for companionship demonstrated higher levels of empathy than owners who kept pets for other purposes such as hunting. Furthermore, there are a number of factors known to influence a person's attitude toward animals that were not measured in the current study, such as socioeconomic class, race, family status, age, educational level, residential environment (i.e. rural vs. urban), and ethical ideology (Kellert, 1985; Kendall, Lobao, & Sharp, 2006; Serpell, 2008; Signal & Taylor, 2006a). Including some of these factors in the present study could have diversified the participant pool. Convenience sampling does not produce a randomly selected participant pool. Consequently, the prevalence of certain attitudes and perceptions among participants in the current study may not accurately represent the general population of pet owners.

Participants in the current study may represent a certain kind of pet owner, as self-selecting sampling measures are subject to selection bias. Owners willing to fill out a survey about their pet most likely enjoy an engaging relationship with their cat or dog. In a study examining owner-dog interactions, researchers found that participants willing to fill out a survey about their pet dog scored high on the shared activities scale and rarely considered their dog to display problematic behaviors (Bennett & Rohlf, 2007). It is also possible that some owners misinterpreted their pet's behavior, thereby affecting behavior ratings. Kerswell, Bennett, Butler, and Hemsworth (2009) found that dog owners' comprehension of their pet's emotional state was not closely related to the number of behaviors they were able to recall their dog displaying. Most

of the subtle signals used by dogs to display their emotional state were largely unreported by owners (Kerswell, Bennett, Butler, & Hemsworth, 2009).

Original behavior scores in the aggression and separation-related behavior categories were uniformly low. Aggression scores for both cat and dog owners averaged close to zero or “never”, while separation-related behavior scores ranged from zero (“never”) to one (“seldom”). The data set does not represent a full range of behavior scores and may therefore be affected by a restricted range, which can obscure the relationship between variables. Due to the high prevalence of zero scores, it was not possible to rescale the behavior data. Therefore, the failure to find a relationship between pet owners’ attitude toward animals and perception of their pet’s behavior should not be generalized to the entire pet owner population without first investigating a broader data set representing a full range of behavior scores. Future studies can include pet owners recruited from veterinary clinics, training establishments, and animal behavior practices to obtain a diverse sample of pets displaying a wide range of behaviors, verified by professionals trained to recognize typical cat and dog behavior.

Low aggression and separation-related behavior scores may also explain why previous training experience did not influence pet owners’ attitude toward animals. It is likely that pet owners with previous training experience develop expectations regarding “proper” pet behavior that mediate their pro-animal welfare attitude. However, if a pet is not exhibiting negative behaviors (indicated by low behavior scores), it may be that owner expectations are met and no longer affect his or her attitude toward animals.

Likert-type scales (such as the ones used in the current study) focus on generalizations. Utilizing a semantic differential-type rating scale to assess pet behavior may result in a broader range of behavior scores and speak to the nuances inherent in cat and dog behavior. Sample

semantic differential-type behavior statements include “confident/relaxed - nervous/timid” and “highly excitable – calm” (Serpell, 1983; Serpell, 1996; Turner & Stambach-Geering, 1990).

The relationship between pet owners’ attitude toward animals and pet behavior perceptions may be influenced by factors that were not accounted for in the current study. Human perceptions are often driven by unconscious processes and can be biased by a person’s expectations and needs, compromising the quality of their judgment (Pronin, 2007). Turner and Stambach-Geering (1990) found that cats rated high in nocturnality were rated as less affectionate toward their owners. The researchers posit that some owners interpreted their cat’s “restless” behavior as a sign of conflict in the relationship rather than as normal cat behavior (Turner & Stambach-Geering, 1990). Zeigler-Hill and Highfill (2010) found that pet owners reported more positive attitudes toward their pets when their interpersonal style matched that of their cat or dog. More specifically, owners were more satisfied with their pets when they believed their cat or dog exhibited a level of warmth that was similar to their own (Zeigler-Hill & Highfill, 2010).

Responsibility for one’s pet may also influence the relationship between pet owner attitudes and perceptions. In a study conducted by Bennett and Rohlf (2007), researchers found that owners who were either primarily responsible for their pet or shared responsibility with another family member rated their pet as displaying fewer aggressive and anxiety-related behaviors. Meyer, Forkman, and Paul (2014) found that empathy was inversely correlated with ratings of aggression for those students who never had responsibility for a pet dog. Having responsibility for a pet provides an owner with the opportunity to develop a strong emotional connection to the animal, which can affect his or her perceptions.

Most studies utilizing the Animal Attitude Scale did not document participants’ attitude scores; however, a comparison of four studies that did provide scores showed that current pet owners scored significantly higher than participants from other social groups, with the exception of those from the animal protection community (see Table 5). Erlanger and Tsytsarev (2012) found that current pet owners scored higher on the caregiving factor of the Attitudes Toward the Treatment of Animals Scale, which measures attitudes toward ensuring animal safety. The fact that animal protectionists demonstrated the highest pro-welfare attitudes is not unexpected, as individuals from this group typically score high in the moralistic typology of basic attitudes towards animals, exhibiting a “primary concern for the right and wrong treatment of animals, with strong opposition to exploitation of and cruelty toward animals” (Kellert, 1985, p. 179).

Table 5

Comparison of Attitude Toward Animals Scores by Study

Study	Participants (# and Type)	Overall Score: <i>M (SD)</i>	Female Score: <i>M (SD)</i>	Male Score: <i>M (SD)</i>
1	156/current pet owners	73.8 (12.1)	75.4 (11.5)	67.3 (12.4)
2a	407/animal protectionists	84.7 (10.5)	85.9 (9.0)	78.4 (14.8)
2b	612/general community	67.6 (9.3)	69.5 (9.1)	63.8 (8.7)
3	194/university students	-	71.9 (-)	65.1 (-)
4	366/university students	-	68.3 (10.6)	63.7 (11.6)

Note. Study 1: current study; Study 2a & Study 2b: Signal and Taylor, 2006b; Study 3: Taylor and Signal, 2005; Study 4: Herzog, Betchart, and Pittman, 1991. ‘-’ indicates that researchers did not provide data for that category.

Previous studies corroborate the finding that females scored higher than males on the Animal Attitude Scale, exhibiting stronger pro-animal welfare attitudes (Apostol, Rebeaga, & Miclea, 2013; Herzog et al., 1991; Mathews & Herzog, 1997; Signal & Taylor, 2007; Taylor & Signal, 2005). Women tend to be more sympathetic toward animal welfare and less supportive of animal research compared to men (Herzog, 2007). Gender is seen as a social status that begets

distinct life experiences, which influence a person's worldview and attitude toward animals (Kendall et al., 2006). A review of human-animal interaction studies found that medium effect sizes were typical when measuring gender differences regarding attitude toward animal use (Herzog, 2007).

However, it is important to note that differences between sexes are typically smaller than differences within sexes. Overlap between female and male distributions is common in human-animal interaction studies (Herzog, 2007). Both female and male attitude scores exhibited in the current study fall within the pro-animal welfare side of the scale. Additionally, gender roles are not immutable. In a study comparing the animal protection community with the general public, men from the animal protection community scored higher on the Animal Attitude Scale than anyone from the general community, regardless of gender (Signal & Taylor, 2007). Lastly, the disproportionate number of female participants in the current study restricts any general conclusions that can be made regarding the affect of gender on attitude toward animals. Future studies should aim to include a more equal distribution of female and male participants.

Previous pet ownership (during childhood and/or as an adult) also resulted in higher attitude scores in the current study. This finding is supported by several previous studies in which a variety of measurement tools were utilized, including the Animal Attitude Scale, Attitudes Toward the Treatment of Animals Scale, and the Animal Empathy Scale (Daly & Morton, 2009; Ellingsen et al., 2010; Erlanger & Tsytsarev, 2012; Paul, 2000; Paul & Serpell, 1993; Rothgerber & Mican, 2014; Serpell, 2005). In a study examining factors affecting veterinary students' attitude toward animals, 72% of participants reported that past experiences and interactions with animals, particularly pets, strongly influenced their personal and professional moral values, second only to their parents' influence (Serpell, 2005).

Owning a pet provides a person with opportunities to share experiences with an animal, thereby increasing the pet owner's familiarity with and knowledge of another species. Preston and de Waal (2002) contend that empathy increases with familiarity, similarity, salience, and past experience. Understanding a pet's behavioral repertoire fosters an emotional connection to the animal, ultimately increasing a pet owner's overall level of empathy and pro-animal welfare attitude.

Empirical studies provide evidence for the theory that childhood pet ownership facilitates the development of empathic concern and humane attitudes toward animals, resulting in higher levels of empathy during adolescence and adulthood (Daly & Morton, 2009; Paul & Serpell, 1993). In a study of elementary school children, Vidovic, Stetic, and Bratko (1999) found that children with pet cats and dogs demonstrated a higher level of socio-emotional functioning than children without pets, particularly in regard to empathy and prosocial behavior, which remained stable as children aged.

Significant differences between cat and dog owner behavior ratings were found in all but two of the behavior categories (ideal aggression and actual separation-related behavior). An understanding of how cat and dog owners differ in their perceptions can be used to develop tailored educational tools and rehabilitation programs for dysfunctional relationships. Finding that dogs were rated as more aggressive than cats corresponds with statistics classifying aggression as one of the most common behavior problems in the pet dog population, as well as the most common behavior problem for which dogs are referred to veterinarians and animal behaviorists (American Society for the Prevention of Cruelty to Animals, n.d.-a; Landsberg, Hunthausen, & Ackerman, 2013; Yalcin & Batmaz, 2007). Salman et al. (2000) examined the reasons pet owners gave for relinquishing their cat or dog to an animal shelter, determining that

bites (22%) and aggression (17%) were the top two reasons for dog relinquishment, while house soiling (43%) was the top reason for cat relinquishment.

Rating cats as less trainable than dogs conforms to the popular depiction of cats as stubborn and difficult to manage. Notari and Gallicchio (2008) found that cat owners believed their cats were more independent than dogs and less amenable to behavior modification. Cat owners in the present study may have rated their cat's trainability based on stereotypes such as these rather than on any real attempt at training their cat, as 83% of cat owners had no previous experience with a trainer or animal behaviorist. The higher expectation of trainability in dogs may be due to the fact that dog owners commonly expect a high standard of conduct from their dogs as a result of societal expectations of proper canine behavior, particularly when in public settings.

Finding that cat owners rated their cats high in separation-related behaviors does not match the traditionally held view that cats are more independent than dogs, a view recently supported by Potter and Mills (2015). However, Serpell (1996) found that cats were not more tolerant of being left alone than dogs, speculating that this divergence from typical cat behavior was due to the fact that cats in the study were acquired from animal shelters. The current study did not include a question regarding pet acquisition, so it is not possible to ascertain whether the same factor played a role in pet owner behavior ratings. Furthermore, Potter and Mills (2015) assert that behaviors thought to indicate separation anxiety may actually be indicators of cat frustration due to owner absence.

Finding significant differences between actual and ideal behavior ratings in the aggression, trainability, and separation-related behavior categories is not entirely surprising, as previous studies demonstrated that it is common for pet owners to have unrealistic expectations

and preconceived notions about how companion animals should behave (Marder & Duxbury, 2008; Payne, Bennett, & McGreevy, 2015; Wells & Hepper, 2000). High expectations may be the result of comparisons to previous pets, inexperience, or belief in the ideal of perfection, particularly prevalent in the United States. While it is possible that this finding indicates owner discontent or unhappiness with the relationship, caution should be used when interpreting the finding as the study did not account for whether an owner is actually troubled by their pet's behavior, a factor that may have a stronger impact on the dyadic relationship. Mean difference scores were low for both cat and dog owners, indicating relationship conflict was not likely an issue. Additionally, only 8% of cat owners and 34% of dog owners hoped their pet would display breed-specific behaviors. In a study examining food-related aggression in shelter dogs, researchers found that adopters did not consider food aggression to be a challenge to keeping their pet and would likely adopt the same dog again (Marder, Shabelansky, Patronek, Dowling-Guyer, & D'Arpino, 2013). Employing the Comfort from Companion Animals Scale (Zasloff, 1996) in future studies would provide a way to measure additional factors that affect the quality of the owner-pet relationship. Sample statements from the scale include "My pet provides me with companionship", "My pet provides me with pleasurable activity", and "Having a pet gives me something to care for".

It is possible that the current study was affected by limitations inherent to online questionnaires. There is no way to gauge how thoughtfully a participant responded to the survey. Moreover, participants responded to the Animal Attitude Scale and behavior assessments based on their understanding and interpretation of each statement, which may vary from person to person, resulting in unreliable data. It is also possible that participants did not understand the

direction to assess their pet's behavior based on both actual and ideal behavior. Future studies can pretest pet owner surveys in order to correct some of these issues.

The surveys assumed a certain level of pet owner knowledge and expertise in assessing cat or dog behavior that may not in fact exist, thereby affecting the accuracy of behavior ratings. Many different breeds with varying physical features were represented in the current study. It is possible that physical traits such as coat and tail length affected pet owners' ability to interpret their pet's behavior. Lastly, it is feasible that participants suffered from response fatigue. Dog owners in particular were required to respond to a greater number of behavior-related questions.

In order to measure the influence of attitude toward animals on a practical level, future studies can include an assessment of human-pet interactions. In a series of studies involving farm animal stockpersons, researchers found that worker attitudes affected farm animal behavior. Stockpersons with negative attitudes toward the animals in their care often handled the animals more aggressively, in turn increasing the number of fear and stress-related behaviors exhibited by the animals (Coleman, Hemsworth, & Hay, 1998; Hemsworth, 2003; Hemsworth & Coleman, 2011). When subjected to a period of cognitive-behavioral training, worker attitudes and behavior toward the farm animals improved, as did farm animal welfare and behavior (Hemsworth, 2003; Hemsworth & Coleman, 2011). Domestic cats and dogs make good candidates for this type of study, as both species are sensitive to owner signals, emotional cues, and behaviors (Duranton & Gaunet, 2015; Galvan & Vonk, 2016; Merola, Lazzaroni, Marshall-Pescini, & Prato-Previde, 2015; Muller, Schmitt, Barber, & Huber, 2015). Similar cognitive behavioral training can be employed to determine whether a change in owner attitude affects pet behavior.

Despite its limitations, the present study contributes to the existing body of research identifying factors that influence a person's attitude toward animals, confirming previous findings regarding the relationship between pro-animal welfare attitudes, gender, and previous ownership. A better understanding of the dynamics involved in owner-pet relationships can be utilized to create educational materials and training programs, with the ultimate goals of improving animal welfare and decreasing pet relinquishment.

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