An investigation of human–animal interactions and empathy as related to pet preference, ownership, attachment, and attitudes in children

Beth Daly and L. L. Morton

Faculty of Education, University of Windsor, Ontario, Canada

Abstract

A group of elementary students (n = 155) were surveyed with respect to four aspects of relationships with pets—preference, ownership, attachment, and attitude—in order to further explore the connection that appears to exist between human–animal interactions and empathy. The investigation was initiated, in part, in order to elaborate upon findings from an earlier study (Daly and Morton 2003) and focused mainly on the relationships between children and dogs and cats, although horses, birds, and fish were also included. Some of the general findings related to dogs and cats are: (1) children who preferred (Pet Preference Inventory) both dogs and cats were more empathic than those who preferred cats or dogs only; (2) those who owned both dogs and cats were more empathic than those who owned only a dog, owned only a cat, or who owned neither; (3) those who were highly attached to their pets (Lexington Attachment to Pets Scale) were more empathic than those who were less attached; and (4) empathy and positive attitude (Pet Attitude Scale) revealed a significant positive correlation. As expected, girls were significantly more empathic than boys. Moreover, while cell sizes were low with respect to pet preference and ownership, empathy was also higher for individuals who expressed a preference for birds and horses. While the earlier study (Daly and Morton 2003) indicated that higher empathy was associated with dog ownership more so than other pets, including cats, a notable finding of the present study is that empathy appears to be positively associated with individuals who prefer, and/or who own, both a dog and a cat. The implications extend to the need: (1) for continued empirical research investigating the relationship between human–animal interactions and empathy; and (2) to refine the questions that lead to a clearer explanation of this relationship.

Keywords: *Bryant Index of Empathy, children; empathy, human–animal interactions, Lexington Attachment to Pets Scale, Pet Attitude Scale, Pet Preference Inventory*

A growing body of empirical research over the past two decades points to the value that human–animal interactions (HAI) have for individuals, benefiting them in psychological, physiological and emotional ways. For instance, research indicates that the presence of dogs can reduce stress in children (Nagengast et al. 1997; Hansen et al. 1999), increase positive perceptions of indi-

Address for correspondence: Dr Beth Daly, University of Windsor, Faculty of Education, 401 Sunset Avenue, Windsor, Ontario, Canada N9B 3P4. Ph: (519) 253 3000; Fax: (519) 971 3694; e-mail: bethdaly@uwindsor.ca.

viduals (Rossbach and Wilson 1992; Geries-Johnson and Kennedy 1995; Wells and Perrine 2001), improve social cohesion amongst schoolchildren (Kotrschal and Ortbauer 2003), comfort individuals with dementia related to Alzheimer's (Baun and McCabe 2003), and provide, along with horses, benefits to prison inmates (Strimple 2003). A specific area of investigation that is of increasing interest to researchers is the relationship between HAI and empathy. Early research suggests that an individual's—particularly a child's—relationship with a pet has positive results with respect to the development of empathy and compassion. While this was speculated upon theoretically by Levinson (1962, 1978) and Melson (1990), later research pointed out that as early as the Victorian era, pets were obtained for children for the positive impact they had on their demonstration of kindness that continued into adulthood (Grier 1999), a belief that persists in contemporary society (Fifield and Forsyth 1999). As such, a number of researchers have sought to examine the positive connection between empathy and pets (Melson 1991; Poresky 1996; Vizek Vidovi´c, Vlahovi´c ˇSteti´c and Bratko 1999; Daly and Morton 2003; Taylor and Signal 2005). While these results are hopeful, they are nevertheless speculative, and thus should be interpreted with caution. For instance, while both Ascione (1992) and Paul (2000) reported some evidence of a connection between humane attitudes toward pets and empathy, the connection is tenuous. Poresky and Hendrix (1990) reported that while pet attachment was correlated with empathy, the level of attachment was based on mothers' ratings from observations of their children, as opposed to self-reports. However, a later study (Hergovich et al. 2002) reported that young children showed an increase in empathy simply as a result of having a dog present in their classroom.

As discussed in an earlier paper (Daly and Morton 2003), the definition of empathy is fluid. Much attention throughout the literature has addressed whether empathy is cognitive or affective, and we continue to hold the view that it is comprised of both cognitive and affective components (Mehrabian and Epstein 1972; Daly and Morton 2003). Further, our definition of empathy also accords with that defined in Bryant's (1982) Empathy Index and Mehrabian and Epstein's (1972) Questionnaire Measure of Emotional Empathy (QMEE). It emphasizes the perceived emotional experience of another person.

In our previous study (Daly and Morton 2003), we sought to examine whether or not empathy was affected by the relationship between children and their pets, but found no significant difference between children who owned pets and those who did not. While an unexpected finding was that children who owned dogs were significantly more empathic than children who owned cats, there was no main effect for empathy in the group. Further, there were no significant differences between pet-owning and non-owning children, nor were there differences for level of attachment. This lack of correlation was puzzling, and thus one purpose of the present investigation was a re-examination and reconfiguration of the three hypotheses that were put forth in the previous (2003) study, which were as follows: (1) children with companion animals are more empathic than those without companion animals; (2) children who are highly attached to their pets are more empathic than those who are less attached; and (3) children who desire, or prefer, a specific type of pet are more empathic than those who desire other types of pets. Each of these hypotheses is now briefly discussed and the findings considered

within the context of current literature as a means of structuring the rationale and interpretation of results for the present study.

The first hypothesis of the previous study was that children with companion animals would be more empathic than those without. The study yielded no support for this hypothesis. The research in this area is scant and somewhat speculative. While the body of empirical literature in this area of HAI and empathy is growing, it still remains theoretical and largely intuitive. For instance, while pet-keeping practices in the Victorian era were largely due to the popular belief that kindness to animals would generalize to people (Grier 1999), there existed no empirical research to support this effect, only presumptions. Further, while Levinson (1970, 1978) advanced that pet-keeping would improve empathic development, this, too, was speculative. Later, Melson and Fogel (1989) and Melson (1990) suggested that children may develop important nurturing abilities through relationships with animals, although recently (Melson 2003) called for further research that might provide clearer perspectives into human–animal relationships.

Another important consideration with respect to existing empirical research is that while an increase in empathy may be a result of pet presence (Hergovich et al. 2002), lasting effects have not been consistently examined. One study (Ascione and Weber 1996) found that although humane attitudes persisted at the time of a post-test conducted at Year Two, it did not specifically address empathy. Paul and Serpell (1993) reported that childhood pet-keeping practices contributed to positive attitudes toward pets in adult life, but Paul (2000) later suggested that while human- and animal-oriented empathy may indeed be linked, results are inconclusive. These studies have positive implications, but more rigid and empirical interventions are necessary in order to determine consistent results with respect to the effects of the child–pet relationship.

The second hypothesis of the previous study, which also was not supported, was that children would be more empathic if they were highly attached to their pets. This was of initial interest in our previous paper because of the body of research which indicated that bonding to one's pets is related to increased empathy (Melson 1991; Poresky 1996; Vizek Vidović, Vlahović Štetić and Bratko 1999). However, there may be several reasons why this hypothesis was refuted. For instance, the relationship between pet attachment and empathy is vague. Several researchers have suggested that extraneous factors, such as age, could have a mediating effect on empathy (Poresky et al. 1988; Melson, Peet and Sparks 1992). Parental marital status might also play a mediating role in the level of attachment. Bodsworth and Coleman (2001) reported that differences in the degree to which children were attached to their pets were connected to single- or two-parent family environments. Similarly, Strand (2004) suggested that child attachment to pets plays a buffering role during parental strife. Another factor might be the freedom, or lack of, that one has in choosing his/her own pet. Kogan and Viney (1998) found that adults who chose their own dogs were significantly more attached to their pet than those who had their dog chosen for them. Children, however, often have siblings or parents involved in choosing the pet, and thus often have limited opportunity to select the pet on their own.

The definition of attachment also poses some challenges in interpreting findings in this research area. Melson (1991) pointed out that early definitions of

human–animal bonding simply assumed a relationship as a result of the mere presence of a pet. Others have reported instrumental limitations with respect to the Companion Animal Bonding Scale (CABS), which was the instrument employed. Because of marginal reliability, Melson (1991) revised the original CABS to include young children's perceptions, thus increasing the reliability. Zasloff (1996) pointed out that the CABS better taps the types of relationships that are most likely with dogs and cats. For instance, questions such as "How often do you hold, stroke, or pet your pet?" and "How often do you travel with your pet?" do not lend themselves well to measuring attachment to such animals as birds, fish, reptiles, or in many cases, even cats. In a study by Triebenbacher (1999), elementary children reported lower attachment scores on the CABS than did adolescents and young adults, suggesting that this particular instrument may actually not be suitable for use with young children. Thus, while children may feel a strong attachment to their pets, it might not have been indicated through the CABS, which was utilized for the study (Daly and Morton 2003).

The third hypothesis was that children with a specific animal preference would be more empathic than those with another type of preference. This was partially supported, because it is with respect to ownership and not necessarily preference, as children who were dog owners were higher in empathy than cat owners—an interesting but perplexing finding. That dog owners are more empathic than cat owners is not necessarily logical, but the findings of several studies by Serpell (1991, 1996) could relate to this finding. In an early study, Serpell (1981) suggested that the attentiveness and sociability of dogs positively impacts on the owner. A later study (Serpell 1991) of health and behavior indicated that while both dog and cat owners enjoyed increased health benefits as a result of pet ownership, dog owners showed more dramatic changes. In exploring pet behavior and attachment levels between owners and pets, Serpell (1996) reported that dog owners rated dogs as being more playful, more confident/relaxed in unfamiliar environments, more affectionate, and friendlier toward strangers. In other words, dogs may be more interactive and personal than cats. To be sure, this does not specifically shed light on why dog owners may be higher than cat owners in empathy, but one could theorize that for some individuals, because dogs present the opportunity for increased health benefits due to such things as regular walks, agreeable companionship, and mutual interaction, this might increase emotional benefits as well, to which empathy is arguably related.

Although limited, other literature points to subtle differences related to pet preferences, usually related to different socio-emotional areas. Zasloff (1995) reported that of 26 pet owners, 70% of dog owners considered their pets to be family members as opposed to only 30% of cat owners. Perrine and Osbourne (1998) examined personality differences as a function of preference for a particular type of pet and reported that both dog- and cat-people liked people more, and believed they were liked more by others, than did non-dog- and non-cat-people. That children's general attitudes toward pets were not investigated was a limitation to this study. For instance, more than 60% of children reported that they "would love" to have a dog, as opposed to the second highest preference, which was preference for a cat (approximately 25%), suggesting that attitudes toward certain pets might play an important role in contributing to the development of empathy, particular-

ly in light of the finding that dog owners were higher in empathy than cat owners. In fact, Taylor and Signal (2005) recently found that there was indeed a clear link between human–human empathy and attitudes toward animals. Empathy was characterized as a particular construct, and not an aspect of personality.

Research Questions

Questions regarding the nature of empathy, as it relates to human–animal relationships, remain unanswered. Specifically, the empathic effect of relationships between children and their pets are enigmatic. Some researchers have clearly shown a positive relationship between children and pets (Melson 2001; Hergovich et al. 2002) while others report speculative and conflicting results about whether or not pets have a positive impact on the emotional development of children (Arambašic, Kuterovac-Jagodić and Vizek Vidović 1999; Daly and Morton 2003). More specific questions need to be addressed in order to gain a clearer understanding of the nature of this relationship.

As such, the purpose of the present study was to elaborate on questions that emerged from the results of the previous study (Daly and Morton 2003), as discussed above. The four hypotheses were shaped from the findings of this previous study, with the intention of employing specific variables that might present a more focused and detailed examination of the factors that mediate empathy with respect to children and their pets. Several of our previous findings were inconsistent with HAI research, particularly the general lack of empathic differences between pet-owning and non-owning children. Recognizing the value of methodical empirical research, it was our intention to examine four specific areas of this relationship, as presented in our hypotheses.

Accordingly, an investigation was undertaken using a different subject group from our previous study, and a different instrument to measure attachment: the CABS was replaced by the Lexington Attachment to Pets Scale (Johnson, Garrity and Stallones 1992), due to biases discussed earlier in this paper. The four working hypotheses that were generated were similar to those from our previous paper and were as follows:

1) Children who prefer dogs are more empathic than those who prefer cats (*Pet Preference*).

2) Children who have dogs are more empathic than those who have cats (*Pet Ownership*).

3) Children who are highly attached to their pets are more empathic than those who are less attached, as measured by the Lexington Attachment to Pets Scale (LAPS) (*Pet Attachment*).

4) Children with a positive attitude toward pets are more empathic than those with a negative attitude toward pets (*Pet Attitude*).

Methods

Participants

Data were collected from students ($n = 155$) in grades four, six, and eight from two elementary schools in southwestern Ontario (Canada). Of these 155, 128 answered the Bryant (1982) Empathy Index. They were then grouped into three age categories (8–10, 11–12, 13–14).

Instruments

A total of five instruments were used in the study. *The Pet Ownership Survey* (Daly and Morton 2003) is a questionnaire on which students provided demographic information (e.g., age, sex), as well as indicating the type of pet, if any, that lived in the home. *The Bryant (1982) Index of Empathy*, also used in the previous study, is a 22-item questionnaire on which participants respond either "yes" or "no" to questions regarding specific situations (e.g., "I get upset when I see a girl being hurt"). Reliability with the current sample was considered adequate (Cronbach's alpha = 0.76). *The Pet Preference Inventory* (Daly and Morton 2003) asks participants to rate the types of pets they would like to have, given the options of cat, dog, horse, fish, bird, and reptile. The *Lexington Attachment to Pets Scale* (LAPS) (Johnson et al. 1992) measures attachment. This 23-item questionnaire includes questions regarding the quality of one's relationship with a pet (e.g., "I think my pet is just a pet," and "I feel that my pet is part of the family"). The reliability with the current sample was excellent (Cronbach's alpha = 0.99), which is comparable with the original author's report of 0.93 (Johnson et al. 1992). *The Pet Attitude Scale (PAS)* (Templer et al. 1981) measures the favorableness of attitudes toward pets. The 18 items on the questionnaire are related to three factors: love and interaction (ex., "I love pets"), pets in the home (e.g., "I feel that pets should always be kept outside"), and joy of pet ownership (e.g., "I really like seeing pets enjoy their food"). The options on the seven-point Likert scale, modified to a five-point scale, ranged from "strongly agree" to "strongly disagree." Reliability was originally reported with a Cronbach's alpha coefficient of 0.93 ($p < 0.001$) (Templer et al. 1981), and the current sample had satisfactory reliability (Cronbach's alpha = 0.86).

Procedure

After obtaining clearance from the local school boards and the university's Research Ethics Board, principals and classroom teachers (grades four through eight) were approached in two schools and invited to participate in the data collection process. Following parental consent, the surveys were administered by the principal investigator in a classroom setting with the participating students. Each sitting lasted approximately 30 minutes. Students who did not own pets did not complete the LAPS.

Results

Descriptive Data

This descriptive information is intended to briefly profile the children with respect to their pets (i.e., ownership, preference, attitude). The proportion of children who had pets was 62%. Of the six main types of pet that were identified, dogs were the most commonly owned (39.4%), followed by fish (34.8%), cats (27.1%), rodents (10.3%), reptiles (7.7%), and birds (6.5%). No individuals had horses. As with the previous study (Daly and Morton 2003), we were also interested in examining the pet preferences of the individuals. An overwhelming majority (85.8%) indicated that they "would love" to have a dog, which was an even more dramatic finding than in our previous study, in which approximately 60% stated a preference for a dog. Similarly, those who preferred a cat was also higher, with 54.2% of participants—in the earlier study was 25%—indicating that they "would love" to have a cat.

Table 1. Frequencies and chi-square analyses for the boys and girls indicating their preference for specific types of pets (their ownership of pets in parentheses).

Pet	Preferred (Owned)		Not Preferred (Don't Own)		Chi-Square
	Male	Female	Male	Female	*p*
Dog	66 (32)	67 (29)	8 (46)	8 (48)	0.97 (0.67)
Cat	39 (20)	45 (22)	34 (58)	31 (55)	0.47 (0.68)
Horse	22	48	49	25	**0.000** (NA)
Fish	42 (30)	38 (24)	31 (48)	37 (53)	0.40 (0.34)
Bird	37 (7)	41 (3)	36 (71)	32 (74)	0.51 (0.20)
Reptile	46 (6)	32 (6)	29 (72)	40 (71)	**0.04** (0.98)
Rodent	36 (9)	40 (7)	32 (69)	32 (70)	0.76 (0.62)

Note. Significant *p* values at the 0.05 level are indicated in boldface.

The sex distribution as it relates to preference for specific pet types is shown in Table 1. Only the Horse category and the Reptile category showed an anomalous sex distribution.

Preliminary Analyses

There were no differences in empathy between the three age groups ($F_{(2, 123)}$ = 0.788, $p > 0.1$), but there was a significant difference for Sex ($F_{(1, 126)} = 42.5$, $p < 0.001$), with females showing higher empathy ($M = 16.05$, $SD = 3.14$) when compared with males ($M = 12.07$, $SD = 3.69$).

Pet Preference

The Dog-Cat Focus

In this first analysis, the focus was on dog and cat preferences, which taps into a basic attitude and parallels the earlier study with children (Daly and Morton 2003). The children were grouped into one of four groups based upon their indicated preferences: (1) Prefer neither dog nor cat ("Prefer Neither") ($n = 8$), (2) prefer dog only ("Dog-Only") ($n = 41$), (3) prefer cat only ("Cat-Only") ($n = 5$), and (4) prefer both dog and cat ("Prefer Both") ($n = 69$). While the distribution was somewhat limited for two of the cells, we nevertheless considered them to be sufficient to warrant inclusion and analysis. Moreover, the sex distribution was not anomalous ($\chi^2_{(3)} = 4.52$, $p > 0.1$). Using the Bryant Empathy Index as the dependent variable, a one-way ANOVA was computed with Preference Group (Neither, Dog-Only, Cat-Only, Both) as the independent variable. While there was no main effect for Preference Group ($F_{(3, 119)} = 1.73$, $p > 0.1$), the post hoc analysis did indicate that the Cat-Only group was less empathic ($M = 10.6$, $SD = 2.70$) than the group preferring Both Dog and Cat ($M = 14.48$, $SD = 3.76$, $p < 0.05$).

The Pet Spectrum Focus

When the data were subsequently analyzed in terms of seven specific pet groups, empathy was seen to be higher for those who preferred Birds ($F_{(1,119)} = 5.78$, $p < 0.025$), and those who preferred Horses ($F_{(1, 118)} = 18.48$, $p < 0.001$). Means and standard deviations are reported in Table 2.

Table 2. Means and standard deviations on the Bryant Empathy Scale for children who showed preferences for specific types of pets.

Pet	Preferred		Not Preferred		Significance
	Mean	*SD*	Mean	*SD*	*p*
Dog	14.15 (n = 112)	3.93	12.85 (n = 13)	3.91	0.26
Cat	14.22 (n = 74)	3.81	13.86 (n = 50)	4.15	0.62
Horse	15.66 (n = 58)	3.47	12.76 (n = 62)	3.89	**0.00**
Fish	14.14 (n = 66)	3.61	13.85 (n = 59)	4.26	0.68
Bird	14.75 (n = 67)	3.67	13.04 (n = 54)	4.14	**0.02**
Reptile	13.81 (n = 68)	3.97	14.11 (n = 56)	4.07	0.68
Rodent	14.22 (n = 69)	3.80	13.96 (n = 50)	4.29	0.73

Note. Significant *p* values at the 0.05 level are indicated in boldface.

The main effect for Horse was suspect, as there were far more females who preferred horses (females 68.5%, males 31%, $\chi^2_{(1)} = 17.41$, $p < 0.001$). To address this imbalance, Sex was entered into the ANOVA as a covariate—the main effect for Horse remained ($F_{(1, 117)} = 6.44$, $p < 0.025$).

Pet Ownership

The Dog-Cat Focus

In this analysis, the focus was on dog and cat ownership, which taps into an experience aspect. The children were grouped into one of four groups based upon their indicated ownership: (1) Have neither dog nor cat ("Have Neither") ($n = 54$), (2) have dog only ("Have Dog") ($n = 40$), (3) have cat only ("Have Cat") ($n = 20$), and (4) have both dog and cat ("Have Both") ($n = 7$). Using the Bryant Empathy Index as the dependent variable, a one-way ANOVA was computed with Ownership Group (Have Neither, Have Dog, Have Cat, Have Both) as the independent variable. There was a main effect for Group ($F_{(3, 124)} = 3.35$, $p < 0.025$). The post hoc analysis indicated that the Have Both group was more empathic ($M = 17.11$, $SD = 2.71$) than the Have Neither group ($M = 14.33$, $SD = 3.83$, $p < 0.05$), the Have Dog group ($M = 13.65$, $SD = 3.87$, $p < 0.025$), and the Have Cat group ($M = 12.56$, SD = 4.22, $p < 0.01$).

The Pet Spectrum Focus

When the data were analyzed in terms of six specific pet groups, empathy was not higher for those who owned particular pets on the pet spectrum. Means and standard deviations are reported in Table 3.

Pet Attachment and Pet Attitude

To examine attachment, a simple correlational analysis was run by calculating correlations between the Lexington Attachment to Pets Scale (LAPS), The Pet Attitude Survey (PAS), and the Bryant Empathy Index, for those who had pets. Attachment (LAPS) did correlate with attitude (PAS) ($r = 0.71$, $p < 0.001$), and with empathy($r = 0.26$, $p < 0.025$). Empathy and attitude also showed a small but significant correlation ($r = 0.33$, $p < 0.01$).

Table 3. Means and standard deviations on the Bryant Empathy Scale for children who have and don't have specific types of pets on the pet spectrum.

Pet	Have Pet		Do Not Have Pet		Significance
	Mean	*SD*	Mean	*SD*	*p*
Dog	14.29 (*n* = 49)	3.91	13.77 (*n* = 79)	4.02	0.48
Cat	13.76 (*n* = 34)	4.35	14.04 (*n* = 94)	3.84	0.73
Fish	14.02 (*n* = 42)	3.68	13.94 (*n* = 86)	4.12	0.91
Bird	14.25 (*n* = 8)	3.15	13.95 (*n* = 120)	4.03	0.84
Reptile	15.30 (*n* = 10)	3.23	13.86 (*n* = 118)	4.02	0.27
Rodent	14.94 (*n* = 16)	3.62	13.83 (*n* = 112)	4.01	0.30

Note. Significant *p* values at the 0.05 level are indicated in boldface.

Discussion

The preliminary analyses revealed no differences in empathy between the two groups of those who owned pets and those who did not. However, girls overall were significantly more empathic than were boys. These results were expected, as they are consistent with the findings from other studies (Feshbach and Roe 1968; Mehrabian and Epstein 1972; Barnett et al. 1980; Eisenberg and Lennon 1983; Gawronski and Privette 1997; Daly and Morton 2003; Baron-Cohen and Wheelright 2004).

With respect to our first hypothesis, which predicted that individuals who prefer dogs would be more empathic than those who prefer cats, students were assigned to four groups: (1) those who preferred neither a dog nor a cat (Prefer Neither); (2) those who preferred only a dog (Prefer Dog); (3) those who preferred only a cat (Prefer Cat); and (4) those who preferred a dog *and* a cat (Prefer Both). Partially supporting the hypothesis, those who preferred *only* a cat were not less empathic than that those who preferred *only* a dog, but *appeared* less empathic than the "Prefer Both" group in a *post hoc* analysis. While the cell sizes were small and these results should be interpreted with caution, they are nevertheless interesting.

There were also two unexpected findings with respect to preference: empathy was higher for the group of individuals who preferred birds and for the group who preferred horses. While these results are initially puzzling, there does appear to be some evidence in the literature that lends support to these findings. For instance, in a study by Kidd, Kelley and Kidd (1983), bird owners scored higher than turtle and snake owners on Affiliation, Nurturance, and Nurturant Parent scales. Bjerke and Ostdahl (2004) found that small birds were the most preferred of 24 species of common urban animals, and that watching birds outside the home was among the most preferred animal-related activities. They pointed to the attractiveness of birds for both their plumage and their sounds. Further, because of the prevalence of birds in wildlife, responses to such are often "mentally restorative" (Bjerke and Ostdahl 2004).

That empathy was higher among those who preferred horses is interesting, and resonates with an early article in which the bond that individuals have with horses was deemed "enigmatic," yet a "complex phenomenon" (Jones 1983). Subsequently, the majority of literature in the area of human-horse relationships

deals exclusively with the area of horse therapy. Nevertheless, there is some limited evidence linking the preference for horses with empathy. For instance, a preliminary study (Kaiser et. al. 2004) reported that children who had no physical or mental disabilities demonstrated reduced anger after participating in a five-day "therapeutic" riding program. It is also interesting to note that, similar to the way in which dogs are often described in HAI literature (Davis and Juhasz 1995), the researchers pointed to the horse as a means of companionship, offering nonjudgmental acceptance, and fostering the development of responsibility.

With respect to the relationship between empathy and the preference for birds and horses, there are some speculative theoretical underpinnings that seem to relate to these two enigmatic findings. Because birds and horses are most often prevalent in natural surroundings and/or rural environments, respectively, it is possible—even likely—that individuals who prefer these have an inclination to interact with nature, as suggested by the biophilia hypothesis (Wilson 1984). While this hypothesis is of course speculative, and not limited to animals found in natural environments (Melson 2001), it is interesting to consider the psychological role that these two species may have in impacting on the well-being of individuals (Melson 2000).

There was partial support for our second hypothesis related to pet ownership—that children who own dogs would be more empathic than cat owners. While there were no significant differences in empathy between these two groups, there were a number of significant differences between those who had both a cat and dog (Have Both), and other groups. Individuals in the Have Both group were (1) more empathic than those who only had a cat (Have Cat), (2) more empathic than those who had only a dog (Have Dog), and (3) more empathic than those who had neither a cat nor a dog (Have Neither). There is a limited literature base from which to draw with respect to the examination of personality differences between "dog people" and "cat people," which might explain the significant differences found. Certainly, there are cultural stereotypes regarding cat- and dog-people that suggest personality is a factor. However, several studies do examine the *perception* of individuals with different pets. For instance, individuals who were accompanied by a dog (Geries-Johnson and Kennedy 1995), or who had dogs in their office (Wells and Perrine 2001), were seen in a more positive light by others than those who had cats present. On the other hand, Paul and Serpell (1993) reported that the actual number of pets individuals had during childhood was associated with their attitudes as adults, and that empathy scores were related to the number of important pets adults had during childhood.

It may simply be that multiple pets, particularly those that allow for the most interaction on the part of children, provide increased opportunity for nurturance and affection, as suggested by Melson (1990, 2003), who also pointed out that empathy is a precursor to nurturance (Melson 2003). Interestingly, Melson, Peet and Sparks (1992) reported that dog and cat owners were not only equally attached to their pets, but those who owned only cats or only dogs nevertheless generalized about pet care beyond the pet they had. Dog owners were as knowledgeable about the care of cats as cat owners were about the care of dogs. As such, children may not necessarily regard the pet as a species, but as an object of affection or nurturance. Thus, the number of pets in a household may be connected to increased

empathy and nurturance. Our findings would support this "number of pets" notion indirectly. We were able to tally the number of children who preferred a pet in each of the seven categories and then compute a total ranging from zero to seven.[1] When we look at the correlations between number of pets preferred we see positive correlations with empathy ($r = 0.19$, $p < 0.05$), with attachment ($r = 0.47$, $p < 0.01$), and with attitude ($r = 0.53$, $p < 0.01$). As children become more inclusive of the animal kingdom their attitudes, attachment, and empathy scores increase. And interestingly, more than 95% of the sample had a preference for two or more pets.

There was support for the third hypothesis that children who were highly attached to their pets were higher in empathy than those with pets who had lower scores on the attitude and attachment scales. These results are consistent with an earlier study (Vizek Vidović, Vlahović Štetić and Bratko 1999) in which children with high attachment to their pets scored not only higher on empathy and prosocial behavior scales, but also rated their family climate in a more favorable light than children who had lower attachment to pets. This also resonates with the finding by Paul and Serpell (1993), in which early involvement with pets reportedly positively impacted on attitudes later in life. In other words, the findings of the present study suggest that such involvement with pets might be a precursor to these positive attitudes. This raises the interesting question of whether family involvement in childhood perhaps provides the nurturing attitudes that lead to close human-pet relationships, as well as empathy. Research in the area of empathy development certainly suggests that this relationship might be reciprocal. Levine (2002), for instance, speculated that biological aspects of empathy are mediated by social contexts, and others have reported that empathic development is enhanced by positive parental influences (Barnett 1987; Davis 1994; Eisenberg and Fabes 1998). While it makes sense, then, that high attachment to pets is correlated with a positive family environment, other researchers have shown children in single-parent families to be more attached to their pets (Bodsworth and Coleman 1991). Strand (2004) has called for further research examining the "buffering effects" of pets during times of strife, and, similarly, the question of whether environment affects both empathy and pet attachment should be examined in depth, as well. Further, while the question of whether animal- and human-oriented empathy are related does remain complex (Paul 2000), empirical evidence increasingly suggests that there is a connection (Ascione 1992; Ascione and Weber 1996; Hergovich et al. 2002; Thompson and Gullone 2003).

There was also support for our final hypothesis, that children who have a positive attitude toward pets are more empathic than those who have a negative, or less positive, attitude. Further, children who were highly attached to their pets also indicated a positive attitude toward pets. Another interesting finding was with respect to attitudes toward pets. While there was no significance with respect to empathy for individual pets, only children with dogs had a significantly more positive attitude toward animals. There was no significance for those with cats, fish, birds, reptiles, or rodents.

Conclusion

The findings of this study are promising and have some interesting implications for future research. In light of heartening results from their recent study, Taylor

and Signal (2005) have called for more investigation in the area of empathy and attitudes toward animals. Other areas of particular interest include whether the number of pets owned, regardless of species, has an effect on empathy or attitudes, and delving deeper into the question of personality differences between "cat and dog people." Others have examined this question (Kidd and Kidd 1980; Perrine and Osbourne 1998), but the research in this area is surprisingly limited. Further investigation in this area that provides more empirical evidence on personality and empathic differences will offer valuable information to the speculative nature of the relationship between empathy and companion animals.

Notes

1. Thank you to an anonymous reviewer for this suggestion.

References

Arambasić, G. K. L., Kuterovac-Jagodić, G. and Vizek Vidović, V. 1999. Pet ownership and children's self-esteem in the context of war. *Anthrozoös* 12: 218–223.

Ascione, F. R. 1992. Enhancing children's attitudes about the humane treatment of animals: Generalization to human-directed empathy. *Anthrozoös* 5: 176–191.

Ascione, F. R. and Weber, C. V. 1996. Children's attitudes about the humane treatment of animals and empathy: One-year follow up of a school-based intervention. *Anthrozoös* 9: 188–195.

Barnett, M. A. 1987. Empathy and related responses in children. In *Empathy and Its Development,* 146–152, ed. N. Eisenberg and J. Strayer. New York: Cambridge University Press.

Barnett, M. A., Howard, J. A., King, L. M. and Dino, G. A. 1980. Antecedents of empathy: Retrospective accounts of early socialization. *Personality and Social Psychology Bulletin* 6: 361–365.

Baron-Cohen, S. and Wheelwright, S. 2004. The empathy quotient: An investigation of adults with Asperger Syndrome or high functioning autism, and normal sex differences. *Journal of Autism and Developmental Disorders* 34: 163–175.

Baun, M. M. and McCabe, B. W. 2003. Companion animals and persons with dementia of the Alzheimer's type. Therapeutic possibilities. *American Behavioral Scientist* 47: 42–51.

Bjerke, T. and Ostdahl, T. 2004. Animal-related attitudes and activities in an urban population. *Anthrozoös* 17: 109–129.

Bodsworth, W. and Coleman, G. J. 2001. Child–companion animal attachment bonds in single- and two-parent families. *Anthrozoös* 14: 216–223.

Bryant, B. K. 1982. An index of empathy for children and adolescents. *Child Development* 53: 413–425.

Daly, B. and Morton, L. L. 2003. Children with pets do not show higher empathy: A challenge to current views. *Anthrozoös* 16: 298–314.

Davis, M. H. 1994. *Empathy: A Social Psychological Approach.* Boulder, CO: Westview Press.

Davis, J. H. and Juhasz, A. M. 1995. The preadolescent/pet friendship bond. *Anthrozoös* 8: 78–82.

Eisenberg, N. and Fabes, R. A. 1998. Prosocial development. In *Handbook of Child Development, Vol. 4: Social, Emotional and Personality Development*, 701–778, ed. N. Eisenberg and W. Damon. New York: John Wiley & Sons, Inc.

Eisenberg, N. and Lennon, R. 1983. Sex differences in empathy and related capacities. *Psychological Bulletin* 94: 100–131.

Feshbach, N. D. and Roe, K. 1968. Empathy in six- and seven-year olds. *Child Development* 39: 133–145.

Fifield, S. J. and Forsythe, D. K. 1999. A pet for the children: Factors related to family pet ownership. *Anthrozoös* 12: 24–32.

Gawronski, I. and Privette, G. 1997. Empathy and reactive depression. *Psychological Reports* 80: 1043–1049.

Geries-Johnson, B. and Kennedy, J. H. 1995. Influence of animals on perceived likeability of people. *Perceptual and Motor Skills* 80: 432–434.

Grier, K. C. 1999. Childhood socialization and companion animals: United States, 1820–1870. *Society & Animals* 7: 95–120.

Hansen, K. M., Messinger, C. J., Baun, M. M. and Megel, M. 1999. Companion animals alleviating distress in children. *Anthrozoös* 12: 142–148.

Hergovich, A., Monshi, B., Semmler, G. and Zieglmayer, V. 2002. The effects of the presence of a dog in the classroom. *Anthrozoös* 15: 37–50.

Johnson, T. P., Garrity, T. F. and Stallones, L. 1992. Psychometric evaluation of the Lexington Attachment to Pets Scale (LAPS). *Anthrozoös* 5: 160–175.

Jones, B. 1983. Just crazy about horses: The fact behind the fiction. In *New Perspectives on Our Lives with Companion Animals,* 87–111, ed. A. H. Katcher and A. M. Beck. Philadelphia: University of Pennsylvania Press.

Kaiser, L., Spence, L. J., Lavergne, A. G. and Bosch, K. L. 2004. Can a week of therapeutic riding make a difference? A pilot study. *Anthrozoös* 17: 63–72.

Kidd, A. H., Kelley, H. T. and Kidd, R. M. 1983. Personality characteristics of horse, turtle, snake, and bird owners. *Psychological Reports* 52: 719–729.

Kidd, A. H., and Kidd, R. M. 1980. Personality characteristics and preferences in pet ownership. *Psychological Reports* 46: 939–949.

Kogan, L. R. and Viney, W. 1998. Reported strength of human–animal bonding and method of acquiring a dog. *Psychological Reports* 82: 647–650.

Kotrschal, K. and Ortbauer, B. 2003. Behavioral effects of the presence of a dog in a classroom. *Anthrozoös* 16: 147–159.

Levine, D. S. 2002. Introduction to the special issue on brain development and caring behavior. *Brain and Mind* 3: 1–7.

Levinson, B. M. 1962. The dog as cotherapist. *Mental Hygiene* 46: 59–65.

Levinson, B. M. 1970. Pets, child development, and mental illness. *Journal of the American Veterinary Medical Association* 157: 1759–1766.

Levinson, B. M. 1978. Pets and personality development. *Psychological Reports* 42: 1031–1038.

Mehrabian, A. and Epstein, N. 1972. A measure of emotional empathy. *Journal of Personality* 40: 525–543.

Melson, G. F. 1990. Fostering inter-connectedness with animals and nature: The developmental benefits for children. *People, Animals, Environment* Fall: 15–17.

Melson, G. F. 1991. Studying children's attachment to their pets: A conceptual and methodological review. *Anthrozoös* 4: 91–99.

Melson, G. F. 2000. Companion animals and the development of children: Implications of the biophilia hypothesis. In *Handbook on Animal-Assisted Therapy*, 375–383, ed. A. Fine. New York: Academic Press,

Melson, G. F. 2001. *Why The Wild Things Are*. Cambridge, MA: Harvard University Press.

Melson, G. F. 2003. Child development and the human–companion animal bond. *American Behavioral Scientist* 47: 31–39.

Melson, G. F. and Fogel, A. 1989. Children's ideas about animal young and their care: A reassessment of gender differences in the development of nurturance. *Anthrozoös* 2: 265–273.

Melson, G. F., Peet, S. and Sparks, C. 1992. Children's attachment to their pets: Links to socio-emotional development. *Children's Environments Quarterly* 8: 55–65.

Nagengast, S. L., Baun, M. M., Megel, M. and Leibowitz, J. M. 1997. The effects of the presence of a companion animal on physiological arousal and behavioral distress in children during a physical examination. *Journal of Pediatric Nursing* 12: 323–330.

Paul, E. S. 2000. Empathy with animals and with humans: Are they linked? *Anthrozoös* 13: 194–202.

Paul, E. S. and Serpell, J. A. 1993. Childhood pet keeping and humane attitudes in young adulthood. *Animal Welfare* 2: 321–337.

Perrine, R. M. and Osbourne, H. L. 1998. Personality characteristics of dog and cat persons. *Anthrozoös* 11: 33–40.

Poresky, R. H. 1996. Companion animals and other factors affecting young children's development. *Anthrozoös* 9: 159–168.

Poresky, R. H. and Hendrix, C. 1990. Differential effects of pet presence and pet-bonding on young children. *Psychological Reports* 67: 51–54.

Poresky, R. H., Hendrix, C., Mosier, J. E. and Samuelson, M. L. 1988. Young children's companion animal bonding and adults' pet attitudes: A retrospective study. *Psychological Reports* 62: 419–425.

Rossbach, K. A. and Wilson, J. P. 1992. Does a dog's presence make a person more likable? Two studies. *Anthrozoös* 5: 40–51.

Serpell, J. A. 1981. Childhood pets and their influence on adults' attitudes. *Psychological Reports* 49: 651–654.

Serpell, J. A. 1991. Beneficial effects of pet ownership on some aspects of human health and behaviour. *Journal of the Royal Society of Medicine* 84: 717–720.

Serpell, J. A. 1996. Evidence for an association between pet behaviour and owner attachment levels. *Applied Animal Behaviour Science* 47: 49–60.

Strand, E. B. 2004. Interparental conflict and youth maladjustment: The buffering effects of pets. *Stress, Trauma, and Crisis: An International Journal* 7: 151–168.

Strimple, E. O. 2003. A history of prison inmate–animal interaction programs. *American Behavioral Scientist* 47: 70–78.

Taylor, N. and Signal, T. D. 2005. Empathy and attitudes to animals. *Anthrozoös* 18: 18–27.

Templer, D. I., Salter, C. A., Dickey, S., Baldwin, R. and Veleber, D. M. 1981. The construction of a pet attitude scale. *The Psychological Record* 31: 343–348.

Thompson, K. L. and Gullone, E. 2003. Promotion of empathy and prosocial behaviour in children through humane education. *Australian Psychologist* 38: 175–182.

Triebenbacher, S. L. 1999. Re-evaluation of the companion animal bonding scale. *Anthrozoös* 12: 169–173.

Vizek Vidović, V., Vlahović Štetić, V. and Bratko, D. 1999. Pet ownership, type of pet, and socio-emotional development of school children. *Anthrozoös* 12: 211–217.

Wells, M. and Perrine, R. M. 2001. Critters in the cube farm: Perceived psychological and organizational effects of pets in the workplace. *Journal of Occupational Health Psychology* 6: 81–87.

Wilson, E. O. 1984. *Biophilia*. Cambridge, MA: Harvard University Press.

Zasloff, R. L. 1995. Views of pets in the general population. *Psychological Reports* 76: 1166.

Zasloff, R. L. 1996. Measuring attachment to companion animals: A dog is not a cat is not a bird. *Applied Animal Behaviour Science* 47: 43–48.