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A cross-cultural comparison of reports by German Shepherd owners in Hungary and the United States of America

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ABSTRACT

Cross-cultural comparisons of dog behavior and dog-keeping practices are limited. The current study compared the questionnaire responses of German Shepherd owners in Hungary and the United States of America (USA). Owners provided information about their dog-keeping practices, as well as reports of their own German Shepherds' behavior and temperament. Cross-cultural differences and similarities were revealed using multivariate regression. Owners from the USA were more likely to keep their dogs indoors during the day ($OR = 29.6, P = 0.006$) and at night ($OR = 772, P = 0.012$), to report that their dogs were kept as pets ($OR = 2648, P = 0.003$), and to engage their dogs in a greater number of training varieties (e.g. conformation training, agility training) ($b = 1.97, P = 0.001$). However, country was not significantly associated with the duration of daily dog-owner interaction, dog's age at acquisition, and the number of previous dogs owned. Owners from the USA rated their dogs more highly than owners from Hungary on the confidence ($b = 0.814, P = 0.006$) and aggressiveness scales ($b = 0.974, P = 0.002$) of the Budapest Canine Personality Survey. In contrast, scores on the liveliness and attachment scales of the Budapest Canine Personality Survey, as well as scores on the Dog-ADHD (attention deficit hyperactivity disorder) Rating Scale, were not predicted by country. Findings for the emotional predisposition questionnaire were similarly mixed. In order to confirm such findings, future cross-cultural studies on dogs should combine the use of surveys with observational methods. Cross-cultural differences like those observed should be considered when interpreting the results of studies on dog cognition and behavior. Researchers may wish to replicate cognitive and behavioral research with dogs from a range of environments around the world before firmly concluding that the findings apply to all dogs.

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1. Introduction

There appears to be cultural variation in dog-keeping practices around the globe. For example, the percentage of dog-owning households varies from country to country. While approximately 40% of households in the Czech Republic and Australia include a dog (Headey, 2006, cited

in King et al., 2009; Sulc, 2005, cited in Houpt et al., 2007), this figure is reduced to only 14% in Austrian households (Kotrschal et al., 2004). Most studies on dog-keeping practices, including those cited above, focus on a single cultural group or country, while cross-cultural studies of dog-keeping practices are still relatively rare (Miklósi, 2007). In one example of such a study, Miura et al. (2002) found that, compared to Japanese college students, British college students had significantly more childhood experiences with animals and were more likely to have considered a childhood pet to be a friend. In addition,

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the British students had significantly more positive attitudes about pets than the Japanese students. A similar study focusing on dog-specific attitudes found that British college students were also significantly more accepting of the practice of euthanasia than Japanese students (Miura et al., 2000).

In addition to cultural differences in pet-related practices and attitudes, one might also ask whether the behavior of pets themselves differs across cultures. Genetic isolation, as well as environmental variation, could contribute to differences in pet behavior across cultures. Several studies have investigated this question. Bradshaw and Goodwin (1998) administered a breed-ranking questionnaire to dog professionals in the United Kingdom that had previously been administered to dog professionals in the USA (Hart and Hart, 1985). In both studies, respondents ranked breeds on thirteen behaviors, such as playfulness and excitability. Takeuchi and Mori (2006) subsequently administered the same questionnaire to veterinarians in Japan, while Notari and Goodwin (2007) administered the questionnaire to dog professionals in Italy. The studies revealed differences among the countries in the behavioral profiles of certain breeds. For example, the Yorkshire Terrier was ranked high on aggressiveness in Italy, but only received average aggressiveness rankings in the USA and the United Kingdom. However, when breeds were assigned to clusters based on behavioral profiles, there was much overlap across the countries in cluster assignments.

These breed-ranking studies, while important in contributing to the cross-cultural literature on dogs, were not immune from certain limitations, pointed out by Notari and Goodwin (2007). For example, the respondents were not required to have experience with each breed that they were asked to rank. Those lacking experience with a breed may have been more likely to rely on breed stereotypes. Furthermore, there are differences in the distributions of breeds around the world. Dog professionals from one country may have limited experience with a breed due to its low frequency, while in another country, the breed may be commonplace. In addition, the design of the study limited respondents to placing the breeds in a rank order. They could not indicate the subjective distance from one ranking to the next. Lastly, more than 20 years separated the first study in the USA from the last in Italy. Therefore, cross-cultural comparisons were made based on questionnaires that were administered at different times without accounting for changes that may have occurred in the breeding, training, and care of dogs over the years.

Our review of the literature on cross-cultural differences in dog-keeping and dog behavior indicates that the area remains largely unexplored, and additional work is clearly needed. To that effect, we surveyed German Shepherd owners in Hungary and the USA about their dog-keeping practices and the behavior of their dogs. In both countries, the German Shepherd Dog is a popular breed and is often used as a working dog (e.g. police, guide, search and rescue). There were several considerations in the design of the study. First, since there can be great variation in attitudes about and care of different dog breeds, even dogs living within the same household (Fielding and Plumridge, 2005), we directed our inquiries

towards German Shepherd owners only. Second, in addition to collecting demographic information about the German Shepherds and their owners and information about owners' relationships with their dogs, we also collected owner responses on the Dog-ADHD (attention deficit hyperactivity disorder) Rating Scale (Vas et al., 2007), Budapest Canine Personality Survey (Horváth et al., unpublished results), and emotional predisposition questionnaire (Sheppard and Mills, 2002). Since the owners were asked to rate their own dogs, we minimized the possibility that owners would rely on breed stereotypes. The full set of questionnaires in this study enabled us to make a cross-cultural comparison of owner-reported dog behavior and temperament, as well as of owners' dog-keeping practices.

2. Methods

2.1. Participants

In order to test the reliability of the questionnaires across languages, 20 Hungarians bilingual in Hungarian and English completed the measures in both languages. For the main cross-cultural comparison, 51 owners of purebred German Shepherd Dogs from the USA and 185 from Hungary participated. Of the participants from the USA, 17 were from the northeastern section of the country, 27 from the Midwest and South, and seven from the West. Participants were asked to volunteer for a dog temperament study and were recruited through German Shepherd clubs and obedience clubs. Adult members of German-Shepherd-owning households who considered themselves to be owners were eligible to complete the questionnaires. Each participant completed up to three questionnaires, one for each German Shepherd that they presently owned. Participants were informed that the study was about purebred German Shepherds, and the questionnaires asked for each dog's kennel club registration number, as well as the name of the dog's breeder. All of the dogs were at least 1 year of age.

2.2. Procedures

Participants received the questionnaires in person, by postal mail, or by e-mail. They completed the questionnaires either by hand or on their computers and submitted them in person, by postal mail, or by e-mail. The questionnaires asked for demographic information about the owners and their dogs, as well as the number of children, adults, and other dogs in their households. In addition, the questionnaires asked about the amount of time the owners interacted with their dogs, where their dogs were kept during the day and at night, what types of training their dogs received, the age of acquisition, the purpose of having their dogs, and the number of dogs previously owned (Appendix A). 51 owners from the USA and 181 from Hungary also completed the recently validated Dog-ADHD Rating Scale (Appendix B: Vas et al., 2007), a 13-item questionnaire based on a human ADHD questionnaire. The questionnaire consists of two subscales used to characterize activity-impulsivity and

inattention in dogs. These scores served as a general measure of activity and attention levels in the participating dogs and were not used for the purposes of diagnosing any type of disorder in the dogs. 51 participants from the USA and 183 from Hungary also completed the Budapest Canine Personality Survey (Appendix C: Horváth et al., unpublished results). This questionnaire asks owners to rate their dogs on a five-point scale on 17 personality dimensions. The ratings provide scores for four main scales: liveliness, confidence, aggressiveness, and attachment to humans. Lastly, 51 participants from the USA and 34 from Hungary completed a 21-item questionnaire created by Sheppard and Mills (2002) to assess the emotional predispositions of dogs (Appendix D). The questionnaire is based on the theories of positive and negative activation, which suggest that affective experiences of various intensities can be summarized into two dimensions, one for positive affect and the other for negative affect (Watson et al., 1999). In addition to providing one main score each for positive and negative activation, three subscores for positive activation are provided for energy and interest, persistence, and excitement.

To assess the reliability of the questionnaires across languages, 20 bilingual dog owners completed both the Hungarian and English versions of the behavior and temperament questionnaires with a delay of 10–14 days between the two versions. Half of the bilinguals completed the English version first, while the other half completed the Hungarian version first.

2.3. Data analysis

SPSS 17.0 was used for all statistical analyses. For the behavior and temperament questionnaires, test–retest correlations (Pearson's r) were calculated to determine the reliability of scale scores across languages. For the main cross-cultural comparison, the demographics of the samples from Hungary and the USA were first compared using t and X^2 tests. Then, to compare dog-keeping practices and owner-reported dog behavior between the countries, the demographic variables found to differ between the countries were controlled using multivariate regression. The regression model for each dependent variable therefore included country, as well as the demographic variables, as predictor variables. Standard multiple regression was used for continuous dependent variables, while multiple logistic regression was used for binary dependent variables. The main statistic of interest from each regression was the coefficient on the country variable (b) in standard regression and the odds ratio (OR) on the country variable in logistic regression. These statistics represented the effect of country on the dependent variable when the demographic variables were held constant.

3. Results

3.1. Reliability across language versions

There was moderate to high reliability between the Hungarian and English versions of the behavior and

personality questionnaires completed by the 20 bilingual participants. The test–retest correlation (r) in scale scores across languages ranged from 0.655 to 0.924. All correlations were significant at $P < 0.01$. The only correlation under 0.7 was observed for the aggressiveness scale of the Budapest Canine Personality Survey. The lowest test–retest correlation for each of the three items contributing to the aggressiveness scale was 0.663. When this item was removed from the aggressiveness scale, the cross-language correlation for the scale improved to 0.747. However, the overall trends found in the main study did not change when the revised two-item scale was used in place of the original three-item scale for aggressiveness. Therefore, results for the original three-item scale are discussed below.

3.2. Demographic variables

There were significant differences between the dog owners from Hungary and the USA who participated in the study (Table 1). The owners from the USA were significantly older than the Hungarian owners, $t(127) = -10.9$, $P < 0.001$. In addition, there were significantly more female owners in the sample from the USA than from Hungary, $X^2(1, N = 181) = 17.2$, $P < 0.001$.

There were also significant differences between the dogs from the two countries in the study. Like their owners, the German Shepherds from the USA tended to be older than those from Hungary, $t(65.6) = -3.8$, $P < 0.001$. They were also more likely than the Hungarian dogs to be spayed or neutered, $X^2(1, N = 139) = 12.2$, $P < 0.001$. The two samples, however, did not differ significantly in the percentages of male and female dogs.

3.3. Household makeup and dog-keeping practices

Next, we determined whether there were significant associations between country of residence and variables related to household makeup, the dog–human relationship and dog-keeping practices. As described above, owner age, owner sex, dog age, and neuter status were found to differ significantly between the samples from the two countries, so multivariate regression was used to control for these variables. Henceforth, the term “demographic variables”

Table 1

Comparison of demographic variables in samples from Hungary and the USA.

Hungary	USA	t	X^2
Owner age			
$M = 31.21$	$M = 53.45$	-10.93^*	
$SD = 12.06$	$SD = 10.01$		
Dog age			
$M = 3.75$	$M = 5.84$	-3.83^*	
$SD = 2.79$	$SD = 3.53$		
Percentage of owners who are female			
53%	86%		17.21*
Percentage of dogs that are female			
45%	53%		0.89
Percentage of dogs that are spayed or neutered			
17%	44%		12.17*

* $P < 0.01$.

Table 2

Descriptive statistics of continuous variables according to country; selected results of multiple regressions controlling for demographic variables.

Dependent variable	Hungary	USA	R^2	F	b on country ^a	95% CI for country b	
						Lower	Upper
Number of adults in household	$M = 2.43$ $SD = 1.25$	$M = 1.80$ $SD = 0.66$	0.30	4.80**	-0.18	-0.87	0.51
Number of children in household	$M = 0.36$ $SD = 0.63$	$M = 0.47$ $SD = 0.95$	0.25	3.87**	1.19**	0.53	1.85
Number of dogs in household	$M = 1.37$ $SD = 1.44$	$M = 2.73$ $SD = 3.76$	0.17	2.31	3.31*	0.44	6.18
Number of previous dogs	$M = 1.14$ $SD = 1.45$	$M = 13.50$ $SD = 25.66$	0.10	0.98	12.66	-6.82	32.14
Hours of interaction per day	$M = 1.91$ $SD = 1.14$	$M = 3.52$ $SD = 3.62$	0.09	1.33	1.62	-0.76	3.99
Age of acquisition (mos)	$M = 6.26$ $SD = 12.93$	$M = 7.68$ $SD = 15.91$	0.04	0.52	3.95	-9.19	17.09
Number of training types	$M = 0.99$ $SD = 0.84$	$M = 2.53$ $SD = 1.70$	0.34	6.48**	1.97**	0.86	3.08

^a Coded as 0 for Hungary and 1 for USA. Controlled variables were owner age, owner sex, dog age, and neuter status.* $P < 0.05$.** $P < 0.01$.**Table 3**

Observed percentages for binary variables according to country; selected results of multiple logistic regressions controlling for demographic variables.

Dependent Variable	Hungary	USA	Nagelkerke R^2	χ^2	Odds ratio (OR) for country ^a	95% CI for country OR	
						Lower	Upper
Kept indoors during the day	31%	88%	0.69	50.37**	29.59**	2.70	324.61
Sleeps indoors at night	32%	96%	0.71	36.72**	771.65*	4.44	134,257.54
Purpose: pet	26%	88%	0.80	62.76**	2648.03**	15.46	453,605.43
Purpose: activity	77%	41%	0.31	19.21**	0.26	0.04	1.63
Purpose: guarding	33%	18%	0.15	7.81	0.08	0.01	0.61

^a Coded as 0 for Hungary and 1 for USA. Controlled variables were owner age, owner sex, dog age, and neuter status.* $P < 0.05$.** $P < 0.01$.

will be used to refer to these four variables. The results of the standard multiple regressions performed are displayed in Table 2, while the results of the multiple logistic regressions are shown in Table 3.

3.3.1. Household makeup

Owners were asked to report the number of adults, children, and other dogs in their households. Country was not a significant predictor of the number of adults in the household when the demographic variables were controlled. In contrast, country was a significant predictor of the number of children, as well as the number of dogs in the household. Each household in the USA included one more child ($b = 1.19$, $P = 0.001$) and three more dogs ($b = 3.31$, $P = 0.025$) than its Hungarian counterpart when the demographic variables were controlled.

3.3.2. Owner experience with dogs

On average, German Shepherd owners from the USA reported a higher number of previous dogs ($M = 13.5$, $SD = 25.7$) than owners from Hungary ($M = 1.14$, $SD = 1.45$). However, the variability around the mean for the USA was notably large, and when the demographic variables were

controlled, country was not a significant predictor of the number of previous dogs.

3.3.3. Dog–owner interactions

Owners also provided the average number of hours per day that they interacted with their dogs. Country did not significantly predict the duration of interaction.

On the other hand, country strongly predicted the location in which owners kept their German Shepherds both during the day and at night. The dogs from the USA were significantly more likely to be kept indoors during the day ($OR = 29.6$, $P = 0.006$) and at night ($OR = 772$, $P = 0.012$) than those from Hungary.

3.3.4. Purpose of having the dog

When asked about the purpose of their dogs, 88% of German Shepherd owners in the USA and 26% of owners in Hungary offered “pet”, “companion”, “family member” or a similar term. Country was a robust predictor of this type of response even when the demographic variables were controlled, $OR = 2648$, $P = 0.003$. In contrast, country was not a significant predictor of activity-related purposes, such as “sport” or “hobby,” or of a guarding or protection purpose.

Table 4

Descriptive statistics of questionnaire scale scores according to country; selected results of multiple regressions controlling for demographic variables.

	Dependent variable	Hungary	USA	R^2	F	b for country ^a	95% CI for country b	
							Lower	Upper
Dog-ADHD Rating Scale ^b	Activity-impulsivity	$M = 1.12$ $SD = 0.61$	$M = 0.88$ $SD = 0.47$	0.13	1.99	-0.05	-0.42	0.31
	Inattention	$M = 0.83$ $SD = 0.48$	$M = 0.74$ $SD = 0.53$	0.06	0.88	-0.05	-0.41	0.31
Budapest Canine Personality Survey ^c	Liveliness	$M = 3.72$ $SD = 0.77$	$M = 3.63$ $SD = 0.59$	0.12	1.88	-0.03	-0.49	0.44
	Confidence	$M = 3.67$ $SD = 0.91$	$M = 4.20$ $SD = 0.75$	0.32	6.27**	0.81**	0.24	1.39
	Aggressiveness	$M = 1.91$ $SD = 0.84$	$M = 2.17$ $SD = 0.93$	0.18	2.90*	0.97**	0.38	1.57
	Attachment	$M = 4.42$ $SD = 0.47$	$M = 4.12$ $SD = 0.41$	0.23	4.09**	-0.22	-0.48	0.04
Emotional predisposition questionnaire ^d	Negative activation	$M = 1.92$ $SD = 0.63$	$M = 1.85$ $SD = 0.56$	0.16	1.98	0.05	-0.49	0.59
	Positive activation (sum of subscales)	$M = 10.29$ $SD = 1.94$	$M = 10.63$ $SD = 1.76$	0.26	3.66**	2.56**	1.07	4.05
	Pos. act.: energy and interest	$M = 3.98$ $SD = 0.87$	$M = 4.29$ $SD = 0.62$	0.08	0.86	0.56	-0.13	1.25
	Pos. act.: persistence	$M = 2.30$ $SD = 0.68$	$M = 2.50$ $SD = 0.80$	0.35	5.64**	1.03**	0.49	1.57
	Pos. act.: excitement	$M = 4.01$ $SD = 0.85$	$M = 3.83$ $SD = 0.83$	0.22	2.98*	0.97*	0.21	1.72

^a Coded as 0 for Hungary and 1 for USA. Controlled variables were owner age, owner sex, dog age, and neuter status.^b Items on 0–3 scale ranging from “never” to “very often”.^c Items on 1–5 scale, e.g. “not at all playful” to “very playful”.^d Items on 1–5 scale ranging from “strongly disagree” to “strongly agree”.* $P < 0.05$.** $P < 0.01$.

3.3.5. Age of acquisition

Owners reported the age of their dogs at acquisition, and country was not a significant predictor of this age.

3.3.6. Number of training varieties

German Shepherds from both countries received formal training in activities like herding, competitive obedience, agility, guarding, tracking, and conformation. The number of training varieties that each dog received was tallied. Country significantly predicted the number of training varieties, with German Shepherds from the USA receiving about two more training varieties per dog than those from Hungary, $b = 1.97$, $P = 0.001$.

3.4. Behavior and temperament questionnaires

Multiple regression analyses were also conducted on scores from the Dog-ADHD Rating Scale, the Budapest Canine Personality Survey, and the emotional predisposition questionnaire. Again, the aim of these analyses was to determine whether country was a significant predictor. Two sets of regressions were performed. In the first set, the demographic variables that differed between the countries (owner age, owner sex, dog age, and neuter status) were entered as predictor variables, along with country, into multiple regressions (Table 4). In the second set of analyses, the dog-keeping variables that differed by country were also included as predictors (Table 5). As noted earlier, owners from the USA were more likely to keep their German Shepherds indoors during the day and

at night, to report that they kept their dogs as pets, and to engage their dogs in more varieties of training. Thus, the first set of regressions controlled for the demographic variables, while the second set controlled for the demographic variables, as well as these dog-keeping variables.

3.4.1. Dog-ADHD Rating Scale

The Dog-ADHD Rating Scale provides scores for two subscales, activity-impulsivity and inattention. Country was not a significant predictor of scores on either subscale in any of the regressions.

3.4.2. Budapest Canine Personality Survey

Country was not a significant predictor of scores on the liveliness or attachment scales in either set of regressions. However, when the demographic variables were controlled, country predicted scores on both the confidence ($b = 0.814$, $P = 0.006$) and aggressiveness scales ($b = 0.974$, $P = 0.002$), with owners from the USA reporting higher scores on both scales. The effect was maintained when the dog-keeping variables were controlled, as well (confidence: $b = 1.17$, $P = 0.019$; aggressiveness: $b = 1.26$, $P = 0.025$). Under this model, owners from the USA rated their dogs over one point higher on a five-point scale for confidence and aggressiveness than owners from Hungary.

3.4.3. Emotional predisposition questionnaire

The emotional predisposition questionnaire provides two main scores, one for positive emotional activation and one for negative emotional activation. When the

Table 5

Selected results of multiple regressions on questionnaire scale scores controlling for demographic and dog-keeping variables.

	Dependent variable	R^2	F	b for country ^a	95% CI for country b	
					Lower	Upper
Dog-ADHD Rating Scale ^b	Activity–impulsivity	0.13	0.84	−0.26	−0.90	0.39
	Inattention	0.13	0.78	−0.07	−0.69	0.55
Budapest Canine Personality Survey ^c	Liveliness	0.26	1.90	−0.25	−0.99	0.50
	Confidence	0.38	3.33**	1.17*	0.20	2.13
	Aggressiveness	0.21	1.46	1.26*	0.16	2.37
	Attachment	0.35	2.87**	−0.34	−0.77	0.09
Emotional predisposition questionnaire ^d	Negative activation	0.24	1.51	−0.08	−0.83	0.67
	Positive activation	0.40	3.25**	1.92	−0.13	3.96
	Pos. act.: energy and interest	0.26	1.68	−0.17	−1.10	0.77
	Pos. act.: persistence	0.41	3.38**	1.39**	0.60	2.17
	Pos. act.: excitement	0.37	2.88**	0.70	−0.33	1.73

^a Coded as 0 for Hungary and 1 for USA. Demographic (owner age, owner sex, dog age and neuter status) and dog-keeping variables (indoors in daytime, indoors at night, number of training types, and “pet” as purpose) were controlled.

^b Items on 0–3 scale ranging from “never” to “very often”.

^c Items on 1–5 scale, e.g. “not at all playful” to “very playful”.

^d Items on 1–5 scale ranging from “strongly disagree” to “strongly agree”.

* $P < 0.05$.

** $P < 0.01$.

demographic variables were controlled, country predicted positive activation ($b = 2.56$, $P = 0.001$), but not negative activation, with owners from the USA reporting higher positive activation in their dogs than the Hungarian owners. In addition, country significantly predicted scores on the persistence ($b = 1.03$, $P < 0.001$) and excitement subscales ($b = 0.965$, $P = 0.014$) of positive activation. On a five-point scale, the owners from the USA reported scores that were about one point higher on these subscales when the demographic variables were controlled. In contrast, scores on the energy and interest subscale were not predicted by country.

When the dog-keeping variables were controlled in addition to the demographic variables, country was only a significant predictor of scores on the persistence subscale, $b = 1.39$, $P = 0.001$. It was no longer a significant predictor of scores on the main positive activation scale or on the excitement subscale.

4. Discussion

In this study, owners of the German Shepherd Dog in Hungary and the USA were surveyed about their dog-keeping practices, as well as their dogs' behavioral attributes. A comparison of the owners' dog-keeping practices revealed that certain characteristics of the dog–owner relationship differed between Hungary and the USA. For example, owners from the USA were more likely than owners from Hungary to keep their German Shepherds indoors. In addition, German Shepherd owners from the USA were more likely than owners from Hungary to offer terms like “pet,” “companion,” or “family member” as the reason for having their dogs. In addition, owners from the USA trained their dogs for more varieties of activities than owners from Hungary.

Other studies have revealed similarly high rates of indoor pet-keeping in the USA. Fielding (2008) found that 96% of a sample of pet owners from the USA permitted

their pets to live indoors, compared to 60% from the Bahamas. Shore et al. (2006) also demonstrated that owners in the USA who keep their dogs indoors tend to be more attached to their dogs than those who keep their dogs outdoors. This association could explain why we found that German Shepherd owners from the USA, most of whom kept their dogs indoors, often referred to their dogs as “family members.”

Our focus on a single breed helped to ensure that the differences observed between owners in Hungary and the USA might be due to culture, rather than breed. However, further studies should be conducted to determine specific cultural or environmental factors which could help to explain our results. For example, the availability of training clubs and classes might influence the amount and variety of training in which owners engage their dogs. If there are increased opportunities for training in the USA, this could be one explanation for the greater number of training varieties pursued by owners from the USA.

The differences discussed suggest that German Shepherds may fill a more central role in the household in the USA than in Hungary. However, we also found notable similarities in dog-keeping practices between Hungary and the USA. Country of residence did not predict the number of dogs previously owned, indicating that owners from both countries were similarly experienced with dogs although considerable variability existed in this measure in the USA. In addition, country did not predict the duration of daily dog–owner interaction, indicating that German Shepherds from Hungary, though more likely to live outdoors, were receiving a similar amount of attention as German Shepherds in the USA.

Interestingly, for many of the dog-keeping variables, variability in the data was greater in the USA than in Hungary. For example, there was much greater variability in the number of previous dogs reported by owners in the USA than in Hungary. There may be several factors that account for the increased variability observed for data from

the USA. First, there may be wider variation among dog owners in the USA than in Hungary in attitudes about the role of dogs in the community and in the household. Second, there may be greater variability among owners in the USA in the opportunity to own a dog or to engage in dog-related activities. Third, variability might be explained by regional, ethnic, or socioeconomic differences within the USA. Brown (2002), for example, reported differences in dog-keeping practices between white and African American veterinary students in the USA. The white veterinary students owned significantly more pets and were more likely to allow these pets to sleep on their beds than the African American students. Additional studies exploring the aforementioned variables in large samples from the USA would provide insight into the greater variability that was observed in the USA.

Overall, due to methodological differences, it is difficult to compare our results on dog-keeping practices with previous findings. For example, a variety of studies have investigated owners' reasons for having a dog, but each study has asked this question in a different manner. In our study, participants were asked a free-response question about the purpose of having their dogs. In research from the United Kingdom (Jagoe and Serpell, 1996) and in a German-speaking sample (Kubinyi et al., 2009), owners were asked about their reasons for having a dog and presented with a list of possible response choices. Owners were not limited in the number of responses they could select. On the other hand, in a study conducted with suburban Australian dog owners, respondents could only select one response from the choices presented (Kobelt et al., 2003). In the three aforementioned studies, the wording of the response choices varied from study to study. Though it may be tempting to compare these types of results, as they appear to provide analogous information about dog-keeping practices from different countries, one should use caution before making such comparisons. It is unclear whether differences in such results would be due to cultural differences in dog-keeping practices or to differences in the methods used to obtain the data. There is a great need for continued cross-cultural work in which the same methods are used in various countries and cultures.

In addition to comparing dog-keeping practices by German Shepherd owners in Hungary and the USA, we also compared owner reports of their dogs' behavior on the Dog-ADHD Rating Scale (Vas et al., 2007), Budapest Canine Personality Survey (Horváth et al., unpublished results), and emotional predisposition questionnaire (Sheppard and Mills, 2002). Scores on many of the questionnaire scales were not predicted by country. For instance, owners from both countries reported similarly low activity-impulsivity, low inattention, and high attachment scores for their German Shepherds. However, scores for confidence, aggressiveness, and persistence were significantly predicted by country, with owners from the USA reporting higher scores.

There may be multiple interpretations of the latter result. One interpretation could be that owner reports accurately reflected differences in the behavior of German Shepherds between the two countries. For example, owners and breeders of German Shepherds in the USA may prefer dogs with higher confidence than owners and

breeders in Hungary. Such a preference could lead to selective breeding for higher confidence, resulting in a population of German Shepherds in the USA with this trait. A second interpretation could be that, rather than reflecting true differences in the behavior of the breed in Hungary and the USA, the findings reflect differences between the countries in attitudes about ideal dog behavior or ideal German Shepherd behavior. For instance, if owners from the USA prefer more confident dogs than owners from Hungary, they may be more likely to rate their dogs higher on this trait, even if the actual behavior of dogs in the two countries is similar. Therefore, future cross-cultural studies should include behavioral observation in order to determine whether cross-cultural differences in owner reports accurately reflect differences in dog behavior.

Lastly, it should be noted that the participants in our study were recruited through breed and obedience clubs. Therefore, the owners in our samples may have been more engaged with their dogs than average dog owners, and the behavior of their German Shepherds may have differed from the behavior of German Shepherds not involved in clubs. However, such biases would have been present in the samples from both countries and therefore should not have impacted the overall trends in our cross-cultural comparison.

5. Conclusion

In the current study, owners of German Shepherds in Hungary and the USA reported on their dog-keeping practices and rated the behavior of their German Shepherds. We found both similarities and differences between reports from the two countries. Our findings highlight the need for the incorporation of observational methods in cross-cultural studies and the need to account for multiple environmental factors. Ethnic, regional, and socioeconomic information might also be considered and could possibly provide insight into within-country variability.

The differences that were observed between German Shepherd owners in the USA and Hungary are examples of the types of cross-cultural differences that may be important to consider when interpreting the results of studies on dog cognition and behavior. Usually, the latter are conducted within a single country, region, or even city, but their findings are often assumed to apply to dogs in general. Boesch (2007) challenged this type of generalization, especially for species found in wide-ranging environmental and social conditions. Dog-keeping practices, owners' perceptions of their dogs, and in fact, dogs themselves may vary around the world, and researchers might consider replicating cognitive and behavioral research with dogs from a variety of environments worldwide before firmly concluding that the findings are applicable to all dogs.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:[10.1016/j.applanim.2009.09.015](https://doi.org/10.1016/j.applanim.2009.09.015).

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