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Attachment to Dogs and Cats in Germany: Translation of the Lexington Attachment to Pets Scale (LAPS) and Description of the Pet Owning Population in Germany

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Introduction: Attachment to pets has been shown to impact pet owners' (PO) physical health and quality of life. As no instrument for obtaining this kind of data currently exists in German, translating and validating the Lexington Attachment to Pets Scale (LAPS) was the aim of this study. *Method:* Online and paper-pencil questionnaires were used. LAPS and socio-demographic data were recorded. Subjects were recruited via social media and with the help of the Verband für das deutsche Hundewesen (VDH) and one other association. A second trial was performed to examine test-retest reliability for the online questionnaire at least five days after initial completion. *Results*: Internal consistency is high for the total LAPS score (Cronbach's = .89). Test-retest reliability is high for total LAPS score (ICC = .95; 95 % CI = .94, .96; p < .001). A significant negative correlation was found between age of the subject and total LAPS score (r = -.24, p < .001). Women scored significantly higher than men in total LAPS score (p = .008, d = -.36) and dog owners (DO) scored higher than cat owners (CO) (p = .020, d = .23). Further, significant differences have been found when comparing among PO to their level of educational attainment (p < .001, ω = .21). No significant differences between owners of pure-bred and owners of mixed breed pets to their animals were found. *Conclusion:* The German translation of the LAPS is a reliable instrument and can be used for future research.

Keywords: LAPS, attachment, dog, cat, Germany

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Attachment to pets and human health

Pet ownership plays an important role in owners' physical and psychological health. In stressful situations that required calculation, dog owners performed better in the presence of their canine companion than in the presence of a human friend (Allen, Blascovich, Tomaka, & Kelsey, 1991). Furthermore, pets have been shown to help reduce hypertension in stressful situations (Allen, Shykoff, & Izzo, 2001). The authors therefore concluded that pets could help decrease stress.

Pet attachment plays an important role in how owners care for their pets. Attachment has been shown to correlate with physical activity and dog owners' (DO) motivation to go on dog walks (Cutt, Giles-Corti, & Knuiman, 2008; Westgarth et al., 2016; Westgarth et al., 2013). On the other hand, Hoerster et al. (2011) did not find that dog-walkers had higher attachment to their dogs than non-dog-walkers. Besides enhancing physical activity, pet dogs have been shown to be important attachment figures for adults (Kurdek, 2009). In an older population it was reported that pet attachment and perceived loneliness are positively correlated (Krause-Parello, 2008; Krause-Parello & Gulick, 2013). The authors state that pet ownership has a moderating effect on general health. It has been shown that loneliness has an overall smaller effect on general health when pet ownership is involved in the model (Krause-Parello, 2008). Consequently, the author states that pet ownership is helpful for older adults to maintain good health.

Conversely, attachment to pets has been associated with higher levels of perceived stress (Peacock, Chur-Hansen, & Winefield, 2012). The authors state that there does not seem to be a moderating effect of attachment to pets on psychological distress. The authors note, however, that the cause-effect relationship remains unclear. As such, it is not possible to declare the reasons for these findings.

Research in cat owners

Within cat owners (CO), research on attachment does not seem to be as advanced as in DO. Johnson, Garrity, and Stallones (1992) found that people who prefer cats do not show as high attachment to their pets as people who prefer dogs. Earlier animal studies failed to find a reliable method for testing attachment of cats to their owners (Potter & Mills, 2015). The main reason for the tests in cats failing to detect bonds might be the different type of territoriality: A cat being tested in an unfamiliar room away from home tends to behave rather cautiously and less confidant than a dog. When looking at results by Wedl et al. (2011), who videographed cat owners and their cats at home, there indeed were subtle types of non-random behavioural synchronization/interaction patterns.

Cultural aspects of animal attachment

Attachment to animals appears to be culturally determined, and the way people see animals can be classified into three categories: humanistic (animals are seen as equal), dominionistic (animals are seen as useful but below humans), and protectionistic (animals are seen as individuals but they are not humanized) (Blouin, 2013). Cultural differences in dog ownership and the perception of dogs can be seen between Japan and the USA (Nagasawa, Kanbayashi, Mogi, Serpell, & Kikusui, 2016). For example, dogs were acquired at

different ages in Japan and the United States of America (USA) (Nagasawa et al., 2016). Moreover, dogs from Japan were reported to differ in their behaviour of aggression in comparison to dogs from the USA (Nagasawa et al., 2016). Additionally, differences in dog keeping that could be related to attachment have been detected between urban and rural populations in the Czech Republic (Baranyiová, Holub, Tyrlík, Janáčková, & Ernstová, 2005). The authors state that people in rural environments walk their dogs less frequently, and if they do so, dogs were more often kept on the leash.

Since the attachment to animals and the way people see them are culturally determined, it is necessary to evaluate the effects of animal attachment for different populations. Since none of the above-mentioned studies were conducted in Germany, it remains unclear whether attachment to pets in Germany is comparable to other countries. Furthermore, there is no valid instrument available in German to measure human animal attachment.

Therefore, the aim of this study was to translate an instrument shown to be reliable in earlier studies and test the translated version for reliability in a German speaking population.

Methods

Translation Process

The instrument chosen for translation was the Lexington Attachment to Pets Scale (LAPS) by Johnson, Garrity, and Stallones (1992). It has been used in several publications on human-animal attachment (Hayama, Chang, Gumus, King, & Ernst, 2016; Helms & Bain, 2009; Kruger, Stern, Anstead, & Finley, 2014; Kwan & Bain, 2013; Miller et al., 2009; Raina, Waltner-Toews, Bonnett, Woodward, & Abernathy, 1999; Reevy & Delgado, 2015; Richards, Ogata, & Cheng, 2016; Schoenfeld-Tacher, Kogan, & Wright, 2010; Shore, Douglas, & Riley, 2005; Singer, Hart, & Zasloff, 1995; Stephens et al., 2012; Stoeckel, Palley, Gollub, Niemi, & Evins, 2014; Weiss & Gramann, 2009). We found it to be the most widely used instrument to measure pet attachment.

The questionnaire contains 23 items overall and measures a total value of pet attachment on a scale of 0 to 69. The subscales “General Attachment”, “People Substituting” and “Animal Rights / Animal Welfare” contain 11, 7 and 5 items each. The coding of the items lies between 0 (strongly disagree) and 3 (strongly agree). All items except items H (I think my pet is just a pet.) and U (I am not very attached to my pet.) show a higher attachment if a higher number is given. In the items H and U a lower coding indicates higher attachment. Consequently, these two items need to be re-coded with the order being reversed.

The translation was performed by the first author (BH) and was validated by the second (UG) and third author (IF). Disagreements in wording were resolved by discussion until consensus was achieved.

Participants

Respondents had to be at least 18 years of age and own at least one dog or one cat.

Materials

Socio-demographic data were collected. These factors were: age, weight in kg, height in cm, sex, family status, educational level, income, employment status, number of people living in the household,

number of children and adolescents under 18 years of age living in the household, number of people over 60 years of age living in the household, state of residence in Germany, size of hometown, access to a garden, and whether the garden is directly adjacent to the home. The last question was asked because it is common in Germany to own a garden that is not directly attached to the home but is frequently visited in leisure time. The authors hypothesized that having a garden directly adjacent to the home could lead to less time shared with the pet, which could result in lower attachment. However, little is known about this condition in Germany and how it might correlate with attachment to pets.

Further, participants were asked about any pre-existing diseases. Additionally, it was asked whether the respondent was the main person responsible for taking care of the animal and, if not, who the main person involved in caring for the animal is. Participants were also asked what kind of animal they own. It was possible to choose whether they owned a dog, a cat, or both a dog and a cat. Depending on the choice made in the before mentioned question, participants were asked about their pet. For both dogs and cats, participants were asked about the number of dogs or cats living in the household. Also, they were asked for the size in cm (measured at the shoulders while standing), the weight in kg, the age, sex, neutering status, and breed of the animal. Dog breeds were divided into subgroups as indicated from the FCI on their website (Federation Cynologique Internationale Office, n.d.). Additionally, they were asked about chronic diseases of the animal. If there was more than one animal of any of a species living in the household, participants were asked to fill out the questionnaire only for the cat or dog that had been living in the household for the longest time. If two animals were acquired at the same time participants were asked to fill in the questionnaire for the older animal. If both animals were the same age and were acquired on the same date, participants were asked to choose one of the animals for the questionnaire. If dogs and cats lived in the household this procedure was followed for each species.

After this, participants answered the LAPS. For these questions participants had to choose whether they filled it in for a dog or a cat. Participants were asked to choose the animal in the same way as they were asked to fill in the data for the dog or cat beforehand. Thus, they had to fill it in for the animal that had lived with them for the longest time. If they had two animals of different species that were acquired on the same day they were asked to focus on the older one.

Procedure

The questionnaire was administered both online and as traditional paper format. The link for the online version was published in social media groups for DO. Further, the “Verband für das Deutsche Hundewesen” (VDH), which is the German representative of the Federatión Cynologiqué International (FCI), published the link on their webpage and their Facebook page. Additionally, an organization that is focused on organizing lectures on animal related topics was contacted to send the link to their clients. This was done to enhance the number of CO in the tested population. Additionally, paper-pencil questionnaires were given to veterinarians who were in-

structed to hand them out to their customers. Overall, five different veterinarians agreed to participate. Two of them in Cologne, one in Berlin, one in Welver, Northrhine-Westphalia (NRW), and one in Rattelsdorf, Bavaria. All veterinarians practiced in Germany.

Data collection was performed for three months from April 1st, 2017 to June 30th, 2017. Within this time participants that filled in the questionnaire in the online form received an e-mail on the fifth, seventh, and tenth day after they filled in the questionnaire for the first time to do the LAPS once again to test for test-retest reliability. Therefore, participants were asked to fill in the questionnaire once (T1) and were contacted via e-mail five days after they filled it in for the first time (T2). If they did not respond to the first e-mail they were contacted for a second (7 days later) and third time (10 days later).

Ethical Approval

Ethical approval of the study was obtained from the ethical committee of the German Sports University Cologne (approval number: 019/2017).

Statistical Analysis

Overall, 686 questionnaires were completed. Only questionnaires that answered the last question were used for analysis. SPSS V24.0 was used. Level of significance was chosen to be $p \leq 0.05$.

Descriptive analysis was done first. Further, internal consistency was tested for T1 in the online and paper-pencil questionnaires. Additionally, internal consistency was calculated for each type of survey using Cronbach's α. Test-retest reliability was tested using the intraclass-correlation-coefficient (ICC) for online questionnaires only. A two-way, mixed model with absolute agreement was used. This analysis was run for the overall scale and all subscales.

After internal consistency and test-retest reliability analyses were run, unpaired *t*-tests were calculated using species of animal, gender of the owner, accessibility of a garden, and being the main person who takes care of the animal as grouping variables. Standard deviation (SD) was calculated. Further, several analyses of variance (ANOVA) were calculated using income, educational status, size of hometown and whether cats, dogs, or cats and dogs were living in the household for grouping. Standard Bonferroni post-hoc procedure was computed if the ANOVA showed significance. Attachment to pets was chosen as the dependent variable (DV). Effect sizes were computed for ANOVA and *t*-tests. For ANOVA, ω was computed, using degrees of freedom and sum of squares. For *t*-tests, Cohen's *d* was calculated using average values and standard deviations. For comparisons between groups only the total LAPS score was used.

Finally, correlations were computed for metric variables with the total LAPS score. For this, the Pearson correlation coefficient was used.

Results

Descriptive statistics – humans

The average age of the population was 40.15 years (SD = 12.45). Average BMI was calculated to be 26.05 (SD = 6.11). Additional descriptive information is available in Table 1. Overall 601 people owned dogs and 242 owned cats. 157 owners owned at least one dog and one cat.

Descriptive statistics – pets

Overall, data for 601 dogs and 242 cats were ascertained. 54.1% of dogs and 54.4% of cats were female. Most cats (94.6%) were castrated/neutered, while this label accounted for only 43.3% of the dogs. Most dogs (75.5%) were classified as pure-breed. Overall, 123 different dog breeds are represented in this study.

The breeds that were most common were Labrador (n = 40) and Golden Retriever (n = 23). Within the FCI-groupings group 1 (Sheepdogs and Cattledogs except Swiss Cattledogs) were most common. The second most stated group was group 8 (Retriever - Flushing Dogs - Waterdogs).

Table 1.
Descriptive statistics of the human population

Variable		n	%
Gender	male	64	9.3
	female	622	90.7
Marital status	single	162	24.0
	married	287	42.5
	in relationship, not married	173	25.6
	widowed	11	1.6
	divorced	43	6.4
	missing	10	
Grew up with animals	yes	572	83.4
	no	114	16.6
	missing	0	
State	Baden-Wuerttemberg	71	10.4
	Bavaria	67	9.8
	Berlin	27	3.9
	Brandenburg	13	1.9
	Bremen	2	.3
	Hamburg	5	.7
	Hessia	45	6.6
	Lower Saxony	72	10.5
	Mecklenburg-Western Pomerania	12	1.8
	NRW	239	34.9
	Rheinland-Palatinate	37	5.4
	Saarland	10	1.5
	Saxony	39	5.7
	Saxony-Anhalt	13	1.9
	Schleswig-Holstein	22	3.2
	Thuringia	11	1.6
	missing	1	
Size of hometown in number of people living in the city	< 5 000	196	28.9
	5 000 - 19 999	161	23.7
	20 000 - 99 999	138	20.3
	100 000 - 499 999	85	12.5
	≥ 500 000	99	14.6
	Missing	7	
Owns a garden	yes	550	80.3
	no	135	19.7
	missing	1	
Garden is directly adjacent to home	yes	471	85.5
	no	80	14.5
	missing	135	

Table 1.
Descriptive statistics of the human population (continued)

Variable		n	%
Monthly income in €	< 1 000	68	12.1
	1 000 - 1 999	160	28.5
	2 000 - 2 999	120	21.4
	3 000 - 3 999	96	17.1
	4 000 - 5 999	90	16.0
	6 000 - 7 999	26	4.6
	8 000 - 9 999	2	.4
	missing	124	
Educational achievement	no graduation	6	.9
	secondary modern school qualification	52	7.6
	intermediate high school certificate	214	31.2
	university of applied science qualification	106	15.5
	high school diploma	131	19.1
	college or university degree	160	23.3
	dissertation	17	2.5
	missing	0	
Employment status	fulltime	329	48.0
	part-time	231	33.7
	not employed	126	18.4
	missing	0	
Alternative if not employed	housewife/-husband	42	33.6
	student	5	4.0
	university student	19	15.2
	apprentice	1	.8
	retired	30	24.0
	unemployed	10	8.0
	other	18	14.4
Mainly responsible for pet	yes	632	92.1
	no	54	7.9
	missing	0	
If not mainly responsible for pet	responsibility is being shared	25	46.3
	spouse/partner is mainly responsible	15	27.7
	children are mainly responsible	2	3.7
	parents are mainly responsible	10	18.5
	siblings are mainly responsible	1	1.9
	dog-sharing	1	1.9
Children/adolescents below 18 years of age are living in the household	yes	147	21.4
	no	539	78.6
	missing	0	
Elderly above 60 years of age are living in the household	yes	93	13.6
	no	591	86.4
	missing	2	
At least one chronical disease is apparent	yes	36	5.2
	no	633	92.3
	no information given	17	2.5

Among cats most individuals did not belong to a defined breed (69.0%). There were 17 cat breeds represented for in this study with European Shorthair (n = 17) being the most prominent one.

The average number of pets in the household, size and weight of dogs and cats are shown in Table 2.

Comparison of DO, CO, and Owner of Both Animals (OB)

Table 3 shows significant results in the comparison of the socio-demographic status of DO, CO, and OB. Regarding family status, DO and OB were more likely to be married than CO, while CO were more likely to be divorced than DO. OB were significantly more likely to state that they grew up with animals than CO, but not DO. DO and OB were more likely to have a garden

Table 2.
Size and weight of dogs and cats

	Dogs				Cats			
Variable	n	M	SD	Range	n	M	SD	Range
Number of Animals owned	599	2.06	1.48	1 - 11	241	2.42	2.13	1 - 15
Age in years	597	6.57	3.79	0.1 - 17.0	241	8.75	4.60	0.25 - 20.0
Body weight in kg	598	22.80	12.82	2.0 - 78.0	240	4.72	1.47	1.5 - 11.0
Body size in cm measured at withers	590	50.16	13.86	16.0 - 86.0	232	26.37	6.15	12.0 - 54.0

Table 3.
Differences in sociodemographic status between DO, CO and OB. Only significant results are shown.

		DO	CO	OB		
Variable		n (%)	n (%)	n (%)	p	Cramer's V
Family status	single	104(23.9)	22(25.9)	36(23.2)	.025	.11
	in stable relationship, not married	110(25.2)	29(34.1)	34(21.9)		
	married*‡	195(44.7)	23(27.1)	69(44.5)		
	widowed	8(1.8)	1(1.2)	2(1.3)		
	divorced*	19(4.4)	10(11.8)	14(9.0)		
Grew up with animals	yes‡	365(82.2)	66(77.6)	141(89.8)	.028	.10
	no‡	79(17.8)	19(22.4)	16(10.2)		
Access to garden	yes, directly adjacent home*‡	318(71.8)	32(38.1)	121(77.1)	<.001	.31
	yes, not adjacent to home	55(12.4)	9(10.7)	16(10.2)		
	no*‡	70(15.8)	43(51.2)	20(12.7)		

DO, dog owner; CO, cat owner; OB, owner of both (dog and cat); *, significant difference between DO and CO $p \leq 0.05$ after Bonferroni correction; ‡, significant difference between CO and OB $p \leq 0.05$ after Bonferroni correction.

attached to their home than CO, while CO were more likely to have no access to a garden at all. Within all other categories no differences between DO, CO, and OB were found.

Attachment to pets - LAPS

The overall descriptive statistic for the online (T1) and paper-pencil questionnaire of the LAPS are shown in Table 4.

Cronbach's α for the overall scale and the subscales is shown in Table 5. The values of the overall scale summed from all items shows good reliability. The scales "General Attachment" and "People Substituting" can be rated as acceptable. The scale "Animal Rights / Animal Welfare" shows not very high reliability.

The results of the test-retest reliability are shown in Table 6. The test-retest analysis shows a high correlation after the retest. Average duration between the first test and the retest was 6.97 days (SD = 2.72 days, range = 5 - 30 days).

Overall, people who completed the questionnaire for a dog scored significantly higher on their attachment (M = 55.49, SD = 8.28) than people who completed the questionnaire for a cat (M = 53.22, SD = 9.92), (t[161.78] = 2.36, p = .020, Cohen's d = .25). Women (M = 55.35, SD = 8.56) scored higher than men (M = 52.30, SD = 8.92), (t[677] = -2.65, p = .008, Cohen's d = -.35). There were no significant differences in attachment to purebred pets compared to mixed breed pets, for either dogs or cats.

Results of the ANOVA show that there are significant differences in the total score of the LAPS when compared to educational level, (F(=[4, 674] = 9.12, p < .001, ω = .21). The Bonferroni post-hoc analysis shows that participants with a college degree ranked significantly lower than all other participants on total LAPS scores (range p = 0.005 - ≤ .001). Further, there is a significant difference when comparing the accessibility of a garden; (F[2, 675] = 4.57, p = .011, ω = .10), with people who have access to a garden that is not adjacent to their homes scoring significantly higher (M = 57.40, SD = 8.03) than participants who have a garden adjacent to their home (M = 54.47, SD = 8.60, p < .05). Additionally, there is a significant difference between groups that differ in income level on total LAPS scores; (F[5, 550] = 5.33, p < .001, ω = .19). Post-hoc analysis finds that people who make less than 1,000 € (M = 56.31, SD = 8.75) or between 1,000 € - 1,999 € (M = 57.21, SD = 8.40) per month show greater attachment to their pets than people who make 4,000 € - 5,999 € (M = 52.04, SD = 8.11) per month. No differences were found in total LAPS scores between people who live in differently sized cities.

Significant correlations were found between the total LAPS score and the age of the participant, the number of people overall, and the number of children living in the household (Table 7), all of which were negatively associated with the total LAPS score. The overall number of dogs and cats owned shows no association to the total LAPS score, nor does the number of elderly people living in the household.

Table 4.
Average Scores of the LAPS for online- (T1) and paper-pencil-questionnaires

	n	M	SD	Range
LAPS total	679	55.07	8.63	20 - 69
General Attachment	681	27.81	3.89	10 - 33
People Substituting	681	14.60	3.98	2 - 21
Animal Rights / Animal Welfare	686	12.64	2.05	5 - 15

Table 5.
Cronbach's α coefficients

	Number of items	Cronbach's α Johnson et al.	Cronbach's α overall	Cronbach's α online	Cronbach's α paper-pencil
LAPS total	23	.928	.89	.89	.89
General Attachment	11	.90	.78	.78	.78
People Substituting	7	.85	.80	.80	.75
Animal Rights / Animal Welfare	5	.80	.69	.69	.68

Table 6.
Test-retest-reliability of the online questionnaire

	ICC	95 % CI	F	df1, df2	p
LAPS total	.95	.94, .96	19.23	453, 453	< .0005
General Attachment	.90	.88, .91	9.64	453, 453	< .0005
People Substituting	.93	.92, .94	15.00	453, 453	< .0005
Animal Rights / Animal Welfare	.91	.90, .93	11.67	453, 453	< .0005

Table 7.
Correlations of LAPS total score

	BMI	Age of the participant	No. of dogs and cats owned	No. of people living in household	No. of children living in household	No. of elderly living in household
LAPS total	0.08*	-0.24***	0.05	-0.10*	-0.14**	0.01

*, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$

Discussion

The results of testing for reliability show that the German translation of the LAPS is a reliable instrument for testing human attachment to dogs and cats. Both the online and the paper-pencil version show good reliability in the total score and the subscales "General Attachment" and "People substituting". Analyzing the scale "Animal Rights / Animal Welfare" is questionable, since internal consistency does not seem to be high enough. Test-retest reliability shows very high correlations after an average time of one week, which suggests that stability over this period of time is high. Not

all scales show good internal consistency. Test-retest reliability, however, is excellent. Consequently, it can be suggested that this instrument is a reliable tool for assessing animal attachment of owners to their pets in German.

Overall, average LAPS values in this study are higher than in the studies of Hayama et al. (2016), Johnson et al. (1992), Shore et al. (2005), and Weiss and Gramann (2009). The two studies of Reevy and Delgado (2015) and Stephens et al. (2012) found similar values, while Kruger et al. (2014) found higher scores in their examination. Singer et al. (1995) found mixed results with the overall score that is higher than the values in this study. All the abovementioned studies that used the LAPS were conducted in the United States of America. One of the reasons for these differences could be the study populations. Hayama et al. (2016) focussed solely on a male population. Therefore, it is plausible that they found a low LAPS value due to sampling bias. Males tend to score lower than females (Johnson et al., 1992; Reevy & Delgado, 2015), which is supported by the current results. Additionally, Hayama et al. (2016) used only a small sample size (30 men total), which makes the LAPS values less reliable because of a lack of statistical power. Shore et al. (2005) questioned undergraduate students about the attachment to their animals. Johnson et al. (1992) stated that age correlates positively with LAPS values. Consequently, the results of Shore et al. (2005) were expected to show lower attachment in young people. Additionally, people with a higher educational degree scored lower in attachment (Johnson et al., 1992), thus lower attachment scores were expectable. Weiss and Gramann (2009) only focussed on CO in the first months
(1 - 14 months) after adoption. Since people who chose cats as their favorite pet were reported to have lower LAPS scores than people who chose dogs as their favorite pets (Johnson et al., 1992) and the duration of owning the animal in this study was rather short, it could explain the lower total LAPS scores in this study compared to the current studies results.

Reevy and Delgado (2015) used a design similar to this study and reached a high number of participants. They chose an internet survey. The recruitment was done via social media networks which might especially attract subjects that are highly attached to their animals and therefore seek to interact with other animal enthusiasts. The reason for the similarity of the results of Stephens et al. (2012) might be that dog owners in this study were recruited in a veterinary clinic. The personal interaction of the researcher and participant might cause subjects to give answers that they expect to be socially desirable. Additionally, the reason might be that people who have higher attachment to their pet seek veterinary advice more often. Also, they only focused on DO who scored higher than CO in earlier findings (Johnson et al., 1992). Although it is complicated to compare the current results with Johnson et al. (1992) because they chose to ask for the favorite pet, not for the pet owned, which might lead to bias in the results.

Considering the previous results, it can be assumed that there are cultural differences in animal attachment. Schoenfeld-Tacher et al. (2010) did not find differences in animal attachment measured with the

LAPS between a Hispanic and non-Hispanic population in the United States and Mexico. This seems to contradict this thesis, but Schoenfeld-Tacher et al. (2010) did find that some questions needed clarification in Mexico City. This could show a difference in what pets mean to people from different cultures. The current study might support Blouin's (2013) statement that pet attachment is culturally determined. Attachment to pets might be different in Central Europe than in the countries studied so far.

One reason for this cultural difference might be the living environment. It differs between countries and might result in enhanced or reduced attachment to pets. The results show that participants show lower attachment to their pet if there is a garden directly adjacent to the home than if they own a garden that is not directly adjacent to the home. It might be true that if there is a garden directly adjacent to the home pets are allowed to be outside for most of the day. Because of this, pet owners with a garden adjacent to their house might not spend as much time with the pet as if they had to engage in activities with the pets. Consequently, the amount of time shared with the pet is less than for people who do not have a garden adjacent to their home or no garden at all. Further, since CO are more likely to not have a garden available, and CO have overall lower total LAPS values, it can be argued that CO might influence the total LAPS score. Since CO have lower total LAPS score values, they might cause an average lower attachment within the population not owning a garden at all. Particularly since CO are a larger percentage of this population. This leads to the conclusion that owning bigger properties and a higher likelihood of having access to a garden adjacent to the home might cause a lower attachment to their animals. This could be a reason why DO and CO in Germany show higher attachment to their pets than DO and CO in larger, less densely populated countries. Additionally, it can be argued that an important role could be that having bigger properties might correlate with a higher income. Attachment has been shown to be higher in low income groups in the current study, which might be the same population that is not able to afford a garden neighbouring their home.

Overall, attachment of cats to humans seems to be different than attachment of dogs to humans. The usage of the Ainsworth Strange Situation test has been shown to be valid for dogs (Topál, Miklósi, Csányi, & Dóka, 1998), but not for cats (Potter & Mills, 2015). Although Potter and Mills (2015) do not fully reject the idea of cats having some sort of attachment, they state that it does not seem to be an attachment that is based on security and safety like in dogs and children. Potter and Mills (2015) found that cats played the same duration when the owner was absent, which is the contrary finding to the same test when dogs were used for testing (Topál et al., 1998). Thus, it can be assumed that the attachment of dogs to a preferred human being is stronger or at least different than the attachment of a cat. Potter and Mills (2015) argue that cats' social behavior shifts on a continuum of social behavior to independency. Additionally, the current study shows differences between the number of dogs and cats being purebred. Being purebred might have an effect on owners attachment to their pets. Turner (2004) states that Siamese cats engage in more social play than

persian cats. A similar tendency has been shown with mixed-breed cats by Turner (2004). It seems that cats seem to have a very broad interindividual continuum for the desire of social contacts (Schwartz, 2003). This makes it difficult to detect overall effects of attachment of cats to CO and might result in a very broad variety of attachment scores of CO to their cats. In the current study, most of the cats are of mixed breed. Following this result, it might be concluded that they do not engage in social play as much as purebred cats which might cause lower degrees of attachment between owner and cat. Logically, it is reasonable that the attachment between CO and their cats is not as strong as the attachment of DO and their dogs. This could explain the higher LAPS scores of DO in the current study.

This study has several limitations. First, participants were recruited online and the sample, consequently, very likely suffers from self-selection bias. It cannot be ruled out that more attached pet owners are more likely to visit the web pages and be involved in groups that engage in discussion about pet animals via social networks. Consequently, generalizing the results of this study should be done with caution.

Second, the retest was done after five days. It could be argued that this period is too short to be informative about how stable attachment to an animal is as characteristic. Indeed, it must be considered that the chance of a carryover effect is possible (Polit, 2014). On the other hand, a longer period of time increases the risk of changing the variable of interest over time (Polit, 2014). It could be argued that this survey should be repeated over a longer time to ensure that the scales are reliable.

Third, the disparity between male and female participation is striking, but within the literature of pet attachment this finding is not uncommon. It is notable but seems to be a typical problem in this research domain. Still, it needs to be mentioned that the likelihood of the sample representing the female population is higher than for the male population. Therefore, giving information about the male population is problematic. This is especially true since Schöberl, Wedl, Beetz, and Kotrschal (2017) found differences in attachment related hormones between dog and human sexes, and Kotrschal, Schöberl, Bauer, Thibault and Wedl (2009) showed that behaviour of male dogs differs between male and female owners. Thus, attachment to pet dogs, and possibly cats, might change between men and women.

Fourth, it is unclear whether the questionnaire gives information about the attachment of the pets to their owners is unknown. Since the questionnaire is only carried out by the owner it is not possible to give a statement about the pets' attachment to its owner. For this another study needs to be done, and the LAPS needs to be compared to an objective test that gives information not only about the owner, but about the dog as well. For dogs, the Ainsworth Strange Situation test might be of appropriate usage (Topál et al., 1998), but this test has been questioned in recent research to be appropriate for use in cats (Potter & Mills, 2015).

The first strength of the study is the large sample size. It is also a strength that a comparison took place between an online questionnaire and a paper-pencil version. Since both results did show high internal consistency, a conclusion might be inferred

that both versions are reliable instruments. This finding is supported by the correlation of the test-retest scenario. Additionally, to our knowledge no test-retest reliability test has been calculated for this questionnaire before. Another strength of this investigation being performed as an online questionnaire is that it is less likely to be biased by social desirability, because there is no direct observation of the subject during the testing (van Gelder, Bretveld, & Roeleveld, 2010).

Conclusion

It can be said that the tested instrument is a reliable questionnaire for testing animal attachment in the German language. Although it is unclear whether the questionnaire considers the pet's side of attachment, it is a reliable questionnaire for measuring human-pet attachment. Since this study only focused on the human side of the relationship, it can be said that the aim of this study has been fulfilled. The authors note that the overall score shows the best reliability. Thus, we suggest only the use of the full inventory. The questionnaire can be used easily, and it can be filled out quickly, which makes it an important instrument for future research and practitioners in Germany. Taking into consideration that the study's population might not be representative for pet owners overall in Germany, it needs to be said that generalizing the results might be troublesome and further studies need to be performed to give final information about attachment to pets in Germany. Additionally, since attachment is culturally determined, the current results might only be a temporary result, and therefore, attachment to pets might change within future research.

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Appendix

Table 8.

Item choices in the English and German version of the LAPS

	English (Johnson et al., 1992)	German Translation
0	Strongly disagree	Trifft überhaupt nicht zu
1	Somewhat disagree	Trifft eher nicht zu
2	Somewhat agree	Trifft eher zu
3	Strongly agree	Trifft voll zu

Table 9.

Items in English and the german translation

	English (Johnson et al., 1992)	German Translation
Ax	My pet means more to me than any of my friends.	Mein Haustier bedeutet mir mehr als jeder meiner Freunde.
Bx	Quite often I confide in my pet.	Ich vertraue mich meinem Haustier häufig an.
C#	I believe that pets should have the same rights and privileges as family members.	Ich finde, dass Haustiere dieselben Rechte und Privilegien haben sollten wie andere Familienmitglieder auch.
Dx	I believe my pet is my best friend.	Ich finde, dass mein Haustier mein bester Freund/meine beste Freundin ist.
Ex	Quite often, my feelings towards people are affected by the way they react to my pet.	Meine Gefühle gegenüber Leuten werden häufig davon beeinflusst, wie sich diese meinem Haustier gegenüber verhalten.
Fx	I love my pet because he/she is more loyal to me than most of the people in my life.	Ich liebe mein Haustier, weil er/sie mir gegenüber loyaler ist, als die meisten Menschen in meinem Leben
Gx	I enjoy showing other people pictures of my pet.	Ich genieße es anderen Menschen Bilder meines Haustieres zu zeigen.
H*#	I think my pet is just a pet.	Ich finde, mein Haustier ist nur ein Haustier.
Ix	I love my pet because it never judges me.	Ich liebe mein Haustier, weil es mich nie verurteilt.
J+	My pet knows when I'm feeling bad.	Mein Haustier weiß es, wenn es mir schlecht geht.
K+	I often talk to other people about my pet.	Ich spreche oft mit anderen Menschen über mein Haustier.
L+	My pet understands me.	Mein Haustier versteht mich.
M+	I believe that loving my pet helps me stay healthy.	Ich glaube, dass die Liebe zu meinem Haustier mir hilft gesund zu bleiben.
N#	Pets deserve as much respect as humans do.	Haustiere verdienen genau so viel Respekt wie Menschen.
O+	My pet and I have a very close relationship.	Mein Haustier und ich haben eine sehr enge Beziehung.
P#	I would do almost anything to take care of my pet.	Ich würde fast alles tun um gut für mein Haustier zu sorgen.
Q+	I play with my pet quite often.	Ich spiele häufig mit meinem Haustier.
R+	I consider my pet to be a great companion.	Ich finde, dass mein Haustier ein toller Begleiter ist.
S+	My pet makes me feel happy.	Mein Haustier macht mich glücklich.
T#	I feel that my pet is a part of my family.	Ich finde, dass mein Haustier ein Teil meiner Familie ist.
U*+	I am not very attached to my pet.	Ich bin meinem Haustier nicht sehr verbunden.
V+	Owning a pet adds to my happiness.	Der Besitz eines Haustieres macht mich glücklicher.
W+	I consider my pet to be a friend.	Für mich ist mein Haustier ein Freund/eine Freundin.

*items that are coded reversely; +General Attachment; xPeople Substituting; #Animal Rights / Animal Welfare