

Development and validation of a scale for measuring pet owners' loyalty to their pet*

Seda ÇAVUŞ ALAN^{1**}, Abdullah ÖZEN¹, Nurhan HALİSDEMİR²

¹Department of History of Veterinary Medicine and Deontology, Faculty of Veterinary Medicine, Firat University, Elazığ, Turkey

²Department of Statistics, Faculty of Arts and Sciences, Firat University, Elazığ, Turkey

Received: 15.11.2022

Accepted/Published Online: 03.02.2023

Final Version: 10.02.2023

Abstract: Loyalty is a person's willingness to devote oneself to a cause and consists of concepts such as fidelity, not giving up, continuity, and stability. For this reason, this relationship stems from loyalty to be able to talk about a strong attachment between humans and animals. This study aimed to develop a measurement tool for the evaluation of the loyalty levels of people toward their pets. The qualitative method for determining the judgments in the scale will be called the pet loyalty scale; the quantitative methods (explanatory factor analysis and confirmatory factor analysis) were used to determine the validity and reliability of the scale. The qualitative method was carried out with 40 animal owners in Bursa, while both quantitative methods were applied to 580 animal owners in İstanbul, Ankara, and İzmir. The analysis of the results revealed that the total variance explanation rate of the scale was 62.1%, and Cronbach's alpha value was 0.764. Consequently, a 19-item pet loyalty scale consisting of four factors, namely "hearty commitment", "stability", "possibility of giving up", and "responsibility", was developed. This scale was considered to have sufficient validity and reliability to measure the loyalty of animal owners to their animals.

Key words: Animal companion, animal owner, loyalty, pet, scale development

1. Introduction

It is seen that the human-animal relationship of thousands of years has continued until today by increasing and differentiating [1]. Especially in the transition period from the agricultural society to the industrial society, there have been structural changes in the way of life of human communities. These changes have indirectly caused a transformation in the meanings that people attribute to animals. Besides other duties, cats and dogs have now started to take on the role of friendship for humans, and the importance of these animals in human life as a family member has increased even more [2,3].

Many studies have been conducted to understand the relationship of attachment between humans and animals [4,5]. Although attachment and loyalty seem very close to each other, they are two different concepts. Loyalty is a person's willingness to devote oneself to a cause and consists of concepts such as fidelity, not giving up, continuity, and stability. However, attachment is a general definition and may only sometimes stem from these concepts. The act of attachment may arise because of loyalty alone or from unrequited love, fidelity, conflicts

of interest, contractual relationship, or addiction [5,6]. Therefore, it is not wrong to say that the measurement of loyalty alone as a parameter that affects the strength of the bond between humans and animals is essential in understanding the quality of power between humans and animals.

The concept of pet is generally defined as "the animal that lives in our house and shares our life" [7]. The fact that being a 'pet' is not a fundamental feature and is only a concept that emerges as a result of people's perspectives and behaviors towards animals causes many animal species (fish, amphibians, birds, reptiles) to be included in this group. Because of their characteristics (ideal body size, not needing to be caged continuously, and being more social than other species), dogs and cats are among the most popular pet animals [7,8]. Therefore, only cats and dogs were included in the scope of this research as pets to limit the field of study.

According to the literature review, there needs to be more information on developing a scale that can measure the loyalty levels of pet owners regarding their animals. The present study was therefore carried out to develop a

* This study is derived from the doctoral thesis titled Development and Validation of a Scale for Measuring Pet Owners' Loyalty to their Pet.

** Correspondence: sedacavuss@gmail.com

measurement tool that can evaluate the loyalty levels of people towards their pets.

2. Materials and methods

The target population of the study was pet owners. Although no official record was available regarding the number of pets and pet owners in Türkiye, the sample was formed based on European Pet Food Industry Federation Report¹, the number of households², and licensed veterinary clinics/hospitals³. The quantitative method was applied in İstanbul, İzmir, and Ankara, while the qualitative method was carried out in Bursa Province. These provinces are the four most crowded provinces in terms of both the number of households and the number of veterinary clinics/hospitals. The study was carried out with animal owners in veterinary clinics in these provinces.

Within the scope of the study, ethics committee approval was obtained from the Ethics Committee of Firat University, Social and Human Sciences Research on May 23, 2019, with the decision number 2019/13.

The mixed research methods (exploratory sequential design) were used in this study [9]. In this context, four phases were established as preliminary test, the qualitative method, the first quantitative method, and the second quantitative method. A purposive sampling technique was employed for qualitative analysis [10]. Cat or dog owners over 18 years old who have owned a pet for at least one year constituted the target population. A total of 40 people (20 dog owners and 20 cat owners) were interviewed in each subgroup. A semistructured interview form developed by the researchers was used for the interviews. First, the participants were informed about the scope of the research that would be carried out voluntarily. The interviews were recorded with a voice recorder with the consent of the participants and then transcribed as they were. The codes were created from the data with the support of 22 experts consisting of 10 academicians from different veterinary faculties, 11 veterinary ethicists, and one sociologist. Subsequently, based on these codes, three themes were created: 'hearty commitment', 'possibility of giving up', and 'responsibility'. After determining the themes and codes, the data was reexamined, and an 'item pool' consisting of 284 items was created. A preliminary test was conducted with 63 pet owners in Bursa to evaluate the items' relevance to the subject, measurability of the features, and intelligibility of the language and meaning. The participants expressed their opinions as "positive

(agree/accept)" or "negative (disagree/reject)" for each item and marked the items that they did not understand or had difficulty in answering as "neutral (I am not sure / I have no idea)". At the end of this test, the items marked as "neutral (I am not sure / I have no idea)" by most participants were removed from the model. A draft Pet Loyalty Scale (DPLS1) constructed of the remaining 55 items was used in the first quantitative method. The items were arranged according to the 5-Point Likert scale, and the option "strongly agree" was scored as five, "agree" as four, "neutral" as three, "disagree" as two, and "strongly disagree" as one.

In the research, the quantitative method was carried out in two stages, namely the first and second quantitative methods. In scale development studies, the sample size should be at least five times the number of items in the scale [11]. A total of 580 people were included in the sample for the analysis by the quantitative methods. In the first quantitative method, 280 people (the number of items in the item pool was 55) were included, and the remaining 300 (the number of items in the item pool was 30) were in the second quantitative method. The first quantitative method was conducted in İstanbul between September and October 2020, and the second was carried out in İstanbul, İzmir, and Ankara between February and March 2021. Both the qualitative and quantitative methods were conducted face-to-face in volunteer veterinary clinics. SPSS 22.00 (IBM, Corp. Armonk, NY, USA) and JAMOVI 2.2.5 (The Jamovi Project, Sydney, Australia) package programs were used to analyze the data [11,12]. Cronbach's alpha (α) coefficient was used to determine the scale's reliability. Explanatory factor analysis (EFA) was performed in the first quantitative method, while explanatory factor analysis and confirmatory factor analysis (CFA) were applied in the second quantitative method.

3. Results

3.1. The first quantitative method

Bartlett's test of sphericity and Kaiser-Meyer-Olkin (KMO) tests, followed by EFA, were used in analysis of DLPS1. The values in Bartlett's test of sphericity and KMO were calculated as $p < 0.001$ and 0.966, respectively. Following EFA, 25 items were removed from the model, and the remaining 30 items were observed to be gathered under three factors. The eigenvalue of the three-factor scale was greater than one and explained 61.1% of the total variance (Table 1).

¹ European Pet Food Industry Federation (FEDIAF). European Facts and Figures 2019 [online]. Website https://www.jardinerie-animalerie-fleuriste.fr/wpcontent/uploads/2020/07/FEDIAF_Facts_and_Figures_2019_compressed.pdf [accessed 1.10.2021].

² Turkish Statistical Institute. Number of households by household types and sizes in 2019 [online]. Website <https://data.tuik.gov.tr/Bulten/Index?p=Istatistiklerle-Aile-2019-33730> [accessed 1.10.2021].

³ Ministry of Agriculture and Forestry. Number of licensed private clinics, policlinics and hospitals in 2019 [online]. Website <https://www.tarimorman.gov.tr/konular/veteriner-hizmetleri/serbest-veterinerlik-ve-veteriner-Laboratuvarlari> [accessed 7.01.2021].

The scree plot was examined to determine the appropriate factor structure in the study. The fourth point was detected as the breaking point, and the scale was explained with three components (Figure).

Cronbach's α coefficient was calculated for the 30-item scale, and the values for each factor are presented in Table 2. A new draft pet loyalty scale 2 (DPLS2) consisting of 30 items was created based on the results of the first quantitative method and was applied in the second quantitative method.

3.2. The second quantitative method

In the second quantitative method, EFA was conducted with the data obtained from 300 pet owners. Bartlett's test of sphericity and KMO test values are shown in Table 3.

Following EFA, 11 items were removed from the model, and a 19-item scale consisting of four factors was formed. The distribution of the items by factors, factor loadings, item-rest correlation, and Cronbach's α coefficient is presented in Table 4.

When the scree plot was examined to determine the appropriate factor structure, the fifth point was observed as the breaking point, and the scale was explained with four components (Figure).

The percentage of explanation of the total variance by the number of factors, the contribution of each factor to the total variance and the factor eigenvalues are shown in Table 1.

DPLS2 was evaluated with model fit indices for the fit between the data set and the model. The chi-square (X^2) value was 356, the degree of freedom (df) was 146, and $p < 0.001$ in the chi-square conformity test. The fit index results of the scale are given in Table 5.

The Cronbach's α coefficients were calculated for 19 items and each factor is given in Table 2.

4. Discussion

This study aimed to develop a scale that can measure the loyalty of animal owners to their animals. Only cats and

dogs were included in the scope of the study as pets. In addition, the research covered four provinces (İstanbul, Ankara, İzmir, and Bursa) which are the most crowded in terms of the number of veterinary medicine establishments and the number of households, instead of all the provinces in Türkiye. This situation may have caused socio-cultural (literacy rate, economic welfare) bias. EFA and CFA were applied to determine the validity and reliability of the scale. In the first quantitative method, Bartlett's sphericity and the KMO tests were used to understand whether the scale was suitable for EFA. The sample and data are considered adequate for factor analysis provided that Bartlett's test of sphericity analysis results are at a significant level ($p < 0.05$) and that the KMO coefficient is greater than 0.60 [13,14]. In the present study, the values for Bartlett's Test of Sphericity and KMO indicate that the sample and data set were sufficient for modeling. In order to reveal the most appropriate factor structure, EFA was performed several times, and 25 items were removed from the model since the factor loadings of these items were below 0.40, and they had a loading value below more than one factor. Moreover, factor eigenvalue, scree plot chart, and the contribution rate of factors to total variance were examined to determine the factor structure of the model [15,16]. It is recommended that factors with an eigenvalue above one should be preferred when determining the number of factors [15]. It was seen that the eigenvalues of the three factors were above one. In the Scree Plot Chart, each line between two points represents a factor. However, since the contribution of the factors after the breakpoint to the total variance is too small to be ignored, the number of factors before the breakpoint is accepted as the ideal for the scale [13,17]. When the scree plot chart was examined in this study, the fourth point was observed as the breaking point and the curve tended to flatten after this point. From this point of view, it was decided to construct DPLS1 with a three-factor structure. In scale studies, different values are accepted in terms of the level of explained the total

Table 1. Explained total variance values.

	Factors	Eigenvalue	Percentage of variance (%)	Percentage of total variance (%)
First quantitative method	1	15.18	50.6	50.6
	2	1.70	5.7	56.3
	3	1.43	4.8	61.1
Second quantitative method	1	7.48	19.2	19.2
	2	1.71	18.5	37.7
	3	1.20	12.2	49.9
	4	1.40	12.2	62.1

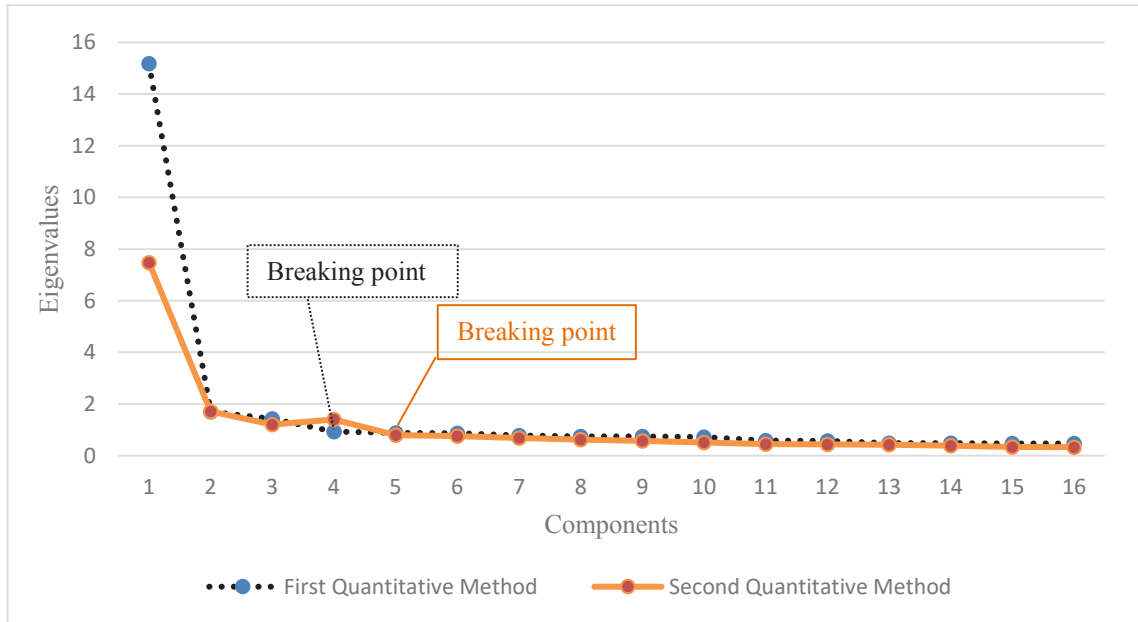


Figure. Scree plot chart.

Table 2. Reliability analysis results of DPLS1 and DPLS2.

	Factors	Number of items	Cronbach's α
First quantitative method	1	22	0.965
	2	4	0.825
	3	4	0.716
	Total (DPLS1)	30	0.928
Second quantitative method	1	6	0.873
	2	6	0.846
	3	4	0.696
	4	3	0.782
	Total (DPLS2)	19	0.764

DPLS1: draft pet loyalty scale 1; DPLS2: draft pet loyalty scale 2

variance. While 50% or more [16,18] is accepted in some sources, 40%–60% [11] is considered ‘sufficient’ in other sources. The total variance explanation level of DPLS1 for three factors was calculated as 61.1% in the current study, which was above the reference values. The contribution of each factor to the total variance is expected to be at least 5% [16]. Although the contribution of Factor 3 to the total variance was below 5% (4.8%), when evaluated with the eigenvalue and scree plot results, it was decided that the most appropriate factor number for DPLS1 was three. In addition, the number of factors determined was the same as the number of themes in the qualitative method. This data was considered an indication that the factor structure was strong.

Cronbach’s α coefficient was calculated to determine the reliability of DPLS1. A high Cronbach’s α coefficient of a scale indicates that the scale items are consistent with each other and contain items measuring the same feature [19]. Cronbach’s α coefficient calculated for the 30-item DPLS1 was 0.928 in this study. Since $0.80 \leq \alpha < 1.00$ is accepted as ‘high reliability’ in the literature [19], it was interpreted that DPLS1 had ‘high reliability’ and provided the necessary internal consistency. As a result of the first quantitative method, a new draft pet loyalty scale (DPLS2) of 30 items was created, consisting of three factors: ‘hearty commitment’ (factor 1), which included 22 items, ‘responsibility’ (factor 2), which included four items, and ‘possibility of giving up’ (factor 3), which included four items.

Table 3. Bartlett’s test of sphericity and Kaiser–Meyer–Olkin results of DPLS2.

Bartlett’s test of sphericity	Chi-square	4952
	df	435
	p-value	<0.001
Kaiser–Meyer–Olkin	0.929	

DPLS2: draft pet loyalty scale 2; df: degrees of freedom; P: probability

After the second quantitative method, Bartlett’s sphericity and KMO tests were conducted to reveal the adequacy of DPLS2 for EFA and suitability for modeling. The result of Bartlett’s test of sphericity ($p < 0.001$) showed that the matrix formed by the relationship between the variables was significant ($p < 0.05$). The KMO test was performed for the sufficiency of the sample size, and the coefficient was calculated as 0.929. Since this value was in the range of 0.90–1.00, the sample size was defined as ‘excellent’ [14]. Because the sample size was sufficient for EFA, it was concluded that the correlation matrix

was significant and the data set was appropriate for modeling and factor analysis. EFA was repeated several times to reveal the most appropriate factor structure, and 11 items with factor load less than 0.40 and appearing below more than one factor were removed from the scale. When the remaining 19 items were evaluated in terms of factor loadings, it was detected that the load values were between 0.422 and 0.810. In general, items with a load value of 0.30–0.59 and 0.60 and above represent the relevant factor as ‘moderate’ and ‘high’ levels, respectively [15]. In the present study, it was observed that 13 of the 19 items represented the relevant factor at a ‘high level’, and the remaining six items represented the relevant factor at a ‘moderate’ level.

To determine the factor structure of the scale, the scree plot chart, factor eigenvalue, and contribution rate of factors to total variance were examined [13,15,16]. In the scree plot chart, the fifth point was the breaking point. Based on this finding, it was decided to construct DPLS2 with a four-factor structure. Factors with an eigenvalue above one are preferred in determining the number of factors [15]. In this study, it was seen that the eigenvalue for each of the four factors was above one.

Table 4. Factor loads, item-rest correlation, Cronbach’s a coefficient results of DPLS2.

	Item no	Factor loading	Item-rest correlation	Cronbach’s a coefficient
Factor 1	I-2	0.624	0.668	0.853
	I-4	0.643	0.740	0.847
	I-9	0.675	0.645	0.859
	I-11	0.649	0.729	0.843
	I-15	0.578	0.678	0.852
	I-19	0.549	0.649	0.856
Factor 2	I-18	0.688	0.644	0.821
	I-5	0.655	0.631	0.821
	I-13	0.422	0.530	0.838
	I-1	0.639	0.706	0.809
	I-14	0.810	0.750	0.795
	I-8	0.462	0.555	0.835
Factor 3	I-7	-0.561	0.508	0.613
	I-16	-0.519	0.433	0.674
	I-12	-0.629	0.518	0.615
	I-10	-0.609	0.487	0.629
Factor 4	I-3	0.634	0.620	0.704
	I-17	0.679	0.597	0.731
	I-6	0.729	0.650	0.673

DPLS2: Draft pet loyalty scale 2

Table 5. Fit index values of DPLS2.

Fit index	DPLS2 value
X ² /df	2.438
CFI	0.916
TLI	0.902
SRMR	0.053
RMSEA	0.069

DPLS2: draft pet loyalty scale 2, X²: chi-square; df: degrees of freedom, CFI: comparative fit index, TLI: Tucker-Lewis index, SRMR: standardized root mean square residual, RMSEA: root mean square error of approximation

The explained total variance value shows the degree of explanation of the scale [16]. The level of the explained total variance of DPLS2 for four factors was calculated as 62.1%, which was above the reference values [11,16,18]. In addition, it was observed that the contribution to the total variance for each factor was over 5% [16,18]. Based on the analysis of the results, the most appropriate factor number for DPLS2 was four. Although the factors were mainly similar to the first quantitative method, EFA results showed that some items (I-1, I-5, I-8, I-13, I-14, I-18) in the theme of ‘hearty commitment’ were grouped as a separate factor and a second factor emerged. It was understood that the participants evaluated these items differently from the theme of ‘hearty commitment’. The factor, including the related items, was renamed ‘stability’, considering the literature content [6,20,21,22] and expert opinions. Accordingly, the scale was shaped as factor 1: ‘hearty commitment’, factor 2: ‘stability’, factor 3: ‘possibility of giving up’ and factor 4: ‘responsibility’.

CFA was conducted to reveal the construct validity of the created measurement tool. In order to evaluate whether the results of the model evaluated in CFA fit the data set, the model was examined using fit indices. The X²/df value of the scale (2.438) was in the range of 2–3, which is considered a ‘good fit’ [23]. On the other hand, the Tucker-Lewis index (TLI) value (0.902) determined in the study was between 0.90 and 0.94, which is considered an ‘acceptable fit’ [24,25]. The comparative fit index (CFI) value (0.916) obtained in this study was above 0.90, which is considered a ‘good fit’ [24]. The root mean square error of approximation (RMSEA) value (0.069) was below 0.08, which indicates an ‘acceptable fit’ [24]. Lastly, the standardized root mean square residual (SRMR) value (0.053) was below ≤0.08, which indicated an ‘acceptable fit’. In sum, the model showed ‘good fit’ in terms of X²/df and CFI, and ‘acceptable fit’ in terms of TLI, RMSEA, and SRMR. These findings showed that

the model and the data set are coherent, and high scores on the loyalty scale might indicate a high level of loyalty.

In order to determine the reliability of the scale (DPLS2), Cronbach’s α coefficient was calculated. The Cronbach’s α coefficient for factor 1 (0.873 - hearty commitment) was within the range of 0.80 – 1.00, which indicated ‘high reliability’ [19]. In the analysis of the item-rest correlation coefficients, the lowest correlation coefficient among the items was calculated as 0.645 (I-9), whereas the highest correlation coefficient was found as 0.740 (I-4). Correlation coefficients must be at least 0.30 to measure the scale’s relevant feature [26]. The items of Factor 1 met this requirement. In addition, a correlation coefficient between 0.40–0.69 and 0.70–0.90 indicates ‘moderate’ and ‘high’ correlations between the items, respectively [27]. Two items (I-4, I-11) of factor 1 had a ‘high level’ correlation, and the rest had a ‘moderate’ correlation. It was concluded that the items of factor 1 could measure the concept of ‘Hearty commitment’.

The Cronbach’s α coefficient for factor 2 (Stability) was calculated as 0.846, which indicated ‘high reliability’. When the item-rest correlation coefficients were examined, it was observed that the values ranged from 0.530 (I-13) to 0.750 (I-14). Two items of factor 2 (I-1, I-14) had a ‘high’-level correlation and the rest had a ‘moderate’-level correlation. It was, therefore, suggested that the items of factor 2 could measure the concept of ‘stability’.

The Cronbach’s α coefficient for factor 3 (possibility of giving up) was calculated as 0.696. This value was between 0.60 and 0.80, which indicates a ‘quite reliability’ [19]. When the item-rest correlation coefficients were examined, it was seen that the values ranged from 0.433 (I-16) to 0.518 (I-12). The items of factor 3 had a ‘moderate’-level correlation. Based on these findings, it was concluded that the items of factor 3 had the ability to measure the concept of ‘possibility of giving up’.

The Cronbach’s α of factor 4 (Responsibility) was 0.782 that was regarded as ‘quite reliable’. When the item-rest correlation coefficients were examined, it was observed that the values ranged from 0.597 (I-17) to 0.650 (I-6). Based on these results, it was suggested that the items of factor 4 could be used to measure the concept of the ‘responsibility’. When the whole scale’s Cronbach’s α coefficient (0.764) was evaluated, it was revealed that the scale was ‘highly reliable’.

In the last step, the items in the Pet Loyalty Scale (PLS) were randomly arranged [28], and the scale was finalized (Appendix 1, 2). All the items were allocated according to the four factors: factor “hearty commitment” (items 2, 4, 9, 11, 15, 19), factor “stability” (items 1, 5, 8, 13, 14, 18), factor “possibility of giving up” (items 7, 10, 12, 16), and factor “responsibility” (items 3, 6, 17). Since items 7, 10,

12, and 16 in the scale were negative, they were reverse-coded in scoring. The highest score of 95 and the lowest score of 19 could be obtained from the scale. When the total score obtained from the scale increases, the loyalty level of the owner to the animal increases.

In conclusion, the PLS was considered a valid and reliable scale that could measure pet owners' loyalty level towards their animals. With PLS, it is aimed to achieve the following gains:

- It will be possible to clarify the unknowns about how and in what way loyalty contributes to the strength of the human-animal bond.
- The low level of loyalty may be related to the torture, cruelty, and mistreatment of animals. Therefore, knowing the loyalty level of the animal owner may be necessary for controlling the animal owners' attitudes and behaviors.
- Leaving or abandoning pets can also be related to loyalty level. Measuring loyalty and in the future preparing a document regarding this test result may contribute to the healthier execution of adoption/sell processes in shelters and other animal sales place.
- It can be said that PLS has the potential to be used effectively in research on veterinary ethics, animal

use, animal behavior, animal welfare, and the human-animal relationship.

Acknowledgment

The study was financially supported by the Firat University Scientific Research Projects with the project numbered VF.20.03.

Conflict of interest

The authors have no conflicts of interest to declare.

Ethical approval

Ethics committee approval of the study was obtained from Firat University Social and Human Sciences Research Ethics Committee with the date of 23.05.2019 and decision number 2019/13.

Informed consent

Information on the subject is available in the main manuscript. *"First of all, the participants were informed about the research and the study was carried out on a voluntary basis. The interviews were recorded with a voice recorder with the consent of the participants and then transcribed as they were."*

References

1. Serpel J. In the Company of Animals: A Study of Human-Animal Relationships. 1st ed. New York, NY, USA: Cambridge University Press; 1996.
2. Hanson JB. The effect of human-animal bonding on quality of life. MSc, University of Nevada, Las Vegas, Nevada, USA, 1997.
3. Özkul T. Empati: Soru ve Cevaplarla İnsan Hayvan Etkileşimi. 1st ed. Bursa, Türkiye: Ezgi Press; 2018 (in Turkish).
4. Hirschman EC. Consumers and their animal companions. Journal of Consumer Research 1994; 20 (4): 616-632. <https://doi.org/10.1086/209374>
5. Zilcha-Mano S, Mikulincer M, Shaver PR. An attachment perspective on human-pet relationships: Conceptualization and assessment of pet attachment orientations. Journal of Research in Personality 2011; 45: 345-357. <https://doi.org/10.1016/j.jrp.2011.04.001>
6. Koç E. İnsan ve sadakat. Felsefe Dünyası Dergisi 2002; 35: 49-57 (in Turkish).
7. Eddy TJ. What is a pet? Anthrozoös 2003; 16 (2): 98-105. <https://doi.org/10.2752/089279303786992224>
8. Wrye J. Beyond pets: Exploring relational perspectives of petness. Canadian Journal of Sociology 2009; 34 (4): 1033-1064. <https://doi.org/10.29173/cjs4110>
9. Creswell JW, Plano Clark VL. Designing and Conducting Mixed Methods Research. 3th ed. Los Angeles, LA, USA: Sage publication; 2018.
10. Robson C. Bilimsel Araştırma Yöntemleri: Gerçek Dünya Araştırması. Çinkır Ş, Demirkasımoğlu N (Translators). 1st ed. Ankara, Türkiye: Anı Press; 2015 (in Turkish).
11. Tavşancıl E. Tutumların Ölçülmesi ve SPSS ile Veri Analizi. 1st ed. Ankara, Türkiye: Nobel; 2002 (in Turkish).
12. Love J, Dropmann D, Selker R, Gallucci M, Jentschke S et al. Jamovi. Computer software. Sydney, Australia: 2017.
13. Shrestha N. Factor analysis as a tool for survey analysis. American Journal of Applied Mathematics and Statistics 2021; 9 (1): 4-11. <https://doi.org/10.12691/ajams-9-1-2>
14. Fernandez G. Statistical Data Mining Using SAS Applications. 2nd ed. New York, NY, USA: CRC Press; 2010.
15. Büyüköztürk Ş. Faktör analizi: Temel kavramlar ve ölçek geliştirmede kullanımı. Kuram ve Uygulamada Eğitim Yönetimi 2002; 32: 470-483 (in Turkish).
16. Yaşlıoğlu MM. Factor analysis and validity in social sciences: Application of exploratory and confirmatory factor analyses. Istanbul University Journal of the School of Business 2017; 46: 74-85 (in Turkish).
17. Koçak D, Çokluk Ö, Kayri M. The Comparison of MAP test, parallel analysis, K1 and Scree-Plot methods in terms of assigning factor numbers. YYU Journal Of Education Facult 2016; 13 (1): 330-359.
18. Streiner DL. Figuring out factors: the use and misuse of factor analysis. The Canadian Journal of Psychiatry 1994; 39 (3): 135-140. <https://doi.org/10.1177/070674379403900303>

19. Özdamar K. Paket Programlar ile İstatistiksel Veri Analizi. 4th ed. Eskişehir, Türkiye: Kaan Press, 2002 (in Turkish).
20. Royce J. The Philosophy of Loyalty. 1st ed. New York, NY, USA: The Macmillan Company; 1908.
21. Connor J. The Sociology of Loyalty. 1st ed. Canberra, ACT, Australia: Springer; 2007.
22. Ustabası Z. Religious experience dimension in Gabriel Marcel's philosophy. *Mizanü'l-Hak: İslami İlimler Dergisi* 2019; (9): 211-249 (in Turkish).
23. Samancıoğlu M. Validity and reliability of Turkish form of leadership density inventor. *Erciyes University Journal of Social Sciences Institute* 2015; 1 (39): 132-144 (in Turkish).
24. Sümer N. Structural equation modeling: Basic concepts and applications. *Türk Psikoloji Yazıları* 2000; 3 (6): 49-74 (in Turkish).
25. Hooper D, Coughlan J, Mullen MR. Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods* 2008; 6 (1): 53-60.
26. Ratner B. The correlation coefficient: Its values range between +1/- 1, or do they? *Journal of Targeting Measurement and Analysis for Marketing* 2009; 17 (2): 139-142. <https://doi.org/10.1057/jt.2009.5>
27. Akoğlu H. User's guide to correlation coefficients. *Turkish Journal of Emergency Medicine* 2018; 18 (3): 91-93. <https://doi.org/10.1016/j.tjem.2018.08.001>
28. Uyumaz G, Çokluk Ö. An investigation of item order and rating differences in Likert-type scales in terms of psychometric properties and attitudes of respondents. *Journal of Theoretical Educational Science* 2016; 9 (3): 400-425. <http://dx.doi.org/10.5578/keg.10011>

Appendix-1. Pet loyalty scale (English version).

	Pet loyalty scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	I never forgive myself if I abandon my pet.					
2	I consider my animal as the companion that accompanies me in my life.					
3	I can change my daily schedule (work, private life, etc.) for my pet.					
4	If my pet gets lost, I'll look for everywhere.					
5	I consider my loyalty is vital to my pet.					
6	I can postpone my vacation plans for my pet if necessary.					
7	Damage to things in the house is a reason for me to leave my pet.					
8	I think abandoning an animal is like 'use and throw away'.					
9	If my pet gets lost, I'll look for until I'm convinced she/he's dead.					
10	If my pet's expenses increase, I may abandon my pet.					
11	I want my pet to be in my life as long as I live.					
12	I can adopt my animal to someone else in cases such as shedding, dirtying the house, damaging the furniture.					
13	I believe abandoning my animal will leave a lasting impression on my pet.					
14	I consider adopting my pet to someone else is like giving up a family member.					
15	When planning my life, I also consider my animal.					
16	If my pet runs away from home, I consider that my pet doesn't want to be with me and I don't look for.					
17	I design my house according to the needs of my animal.					
18	I consider leaving my animal on the street as equivalent to leaving a member of my family on the street.					
19	I use all communication networks (advertising, social media, etc.) to find my animal if she/he gets lost.					

Appendix-2. Pet Sadakat Ölçeği (Turkish version).

Pet sadakat ölçeği	Kesinlikle Katılıyor	Katılıyor	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
1					
Hayvanımı terk edersem kendimi affedemem.					
2					
Hayvanımı yaşamımda bana eşlik eden yol arkadaşım olarak görüyorum.					
3					
Hayvanım için gündelik programımı (iş, özel hayat vb.) değiştirebiliyorum.					
4					
Hayvanım kaybolursa gideceği gidemeyeceği her yeri ararım.					
5					
Hayvanıma olan sadakatimin onun için hayati olduğunu düşünüyorum.					
6					
Gerekirse ev hayvanım için tatil planlarımı erteleyebilirim.					
7					
Evdeki eşyalara zarar vermesi, hayvanımı bırakmam için bir sebeptir.					
8					
Bir hayvanı bırakmanın, onu 'kullanıp atmak' gibi olduğunu düşünüyorum.					
9					
Ev hayvanım kaybolursa öldüğüne kanaat getirinceye kadar ararım.					
10					
Hayvanımın masrafları artarsa onu bırakabilirim.					
11					
Yaşadığım müddetçe hayvanımın hayatında hep olmasını istiyorum.					
12					
Tüy dökme, evi kirletme, eşyalara zarar verme gibi durumlarda hayvanımı başkasına sahiplendirebilirim.					
13					
Hayvanımı terk etmenin onda hiç geçmeyecek bir iz bırakacağı düşünüyorum.					
14					
Hayvanımı başka birine sahiplendirmenin ailemden birinden vazgeçmek gibi bir şey olduğunu düşünürüm.					
15					
Hayatımı planlarken hayvanımı da göz önünde bulundururum.					
16					
Eğer evden kaçıp giderse hayvanımın benimle olmak istemediğini düşünürüm ve aramam.					
17					
Evimi, hayvanımın rahatına göre dizayn ederim.					
18					
Hayvanımı sokağa bırakmayı ailemden birini sokağa bırakmakla eşdeğer görüyorum.					
19					
Kaybolması halinde hayvanımı bulmak için tüm iletişim ağlarımı (ilan verme, sosyal medya vb.) kullanırım.					