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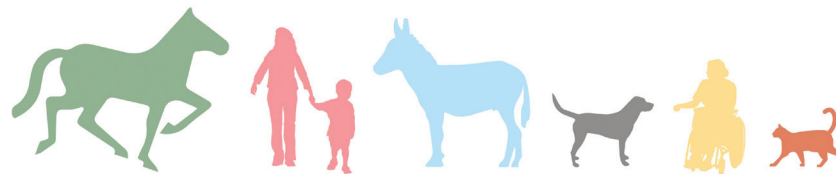
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## Interpersonal and Pet Attachment, Empathy toward Animals, and Anthropomorphism: An Investigation of Pet Owners in Romania

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**Keywords:** pet attachment anxiety, pet attachment avoidance, interpersonal attachment, empathy toward animals

**Abstract** The current study investigates the associations between interpersonal and pet attachment (anxiety and avoidance dimensions), empathy toward animals, and anthropomorphism in the Romanian cultural context, where problems regarding the effectiveness of pet management programs are still being reported. A sample of 244 adult respondents, with a mean age of 32.9 years, mostly females (89.8%) and pet owners, completed standard instruments of interpersonal and pet attachment, empathy toward animals and anthropomorphism. In agreement with other studies in the field of human-animal interactions, our data indicate that female pet owners scored higher than male owners in empathy toward animals and the level of anthropomorphism. Dog owners scored higher in empathy toward animals and anthropomorphism, and lower in pet attachment avoidance compared to owners of other types of pets (cats, reptiles, birds, etc.). Our data indicate significant correlations between anxiety and avoidance dimensions of pet and interpersonal attachment. The level of anthropomorphism was positively associated with pet attachment anxiety and empathy toward animals, and negatively associated with pet attachment avoidance. A partial mediation of the relationship between pet attachment avoidance and anthropomorphism by empathy toward animals was found. Results are discussed from the perspective of considering empathy toward animals as an important variable to be addressed in humane education programs and in attachment-based counseling of current and future pet owners.

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## Introduction

Companion animals, especially dogs and cats, are a constant presence in human ecologies and are increasingly perceived as family members and significant others (Meehan, Massavelli, & Pachana, 2017; Okoniewski, 1984; Woodward & Bauer, 2007). The beneficial role of companion animals in human life has long been documented and various positive effects have been described for human physical and psychological health (e.g., Beck & Madresh, 2008; Beetz, Julius, Turner, & Kotrschal, 2012; Chandler, Portrie-Bethke, Minton, Fernando, & O'Callaghan, 2010; Fine, 2010).

From an evolutionary perspective, pet keeping is considered a paradox in terms of the costs of caring for animals and the fitness-related benefits to humans (i.e., benefits for survival and reproduction; Serpell & Paul, 2011). Even though the mechanisms behind the communality of companion animals' presence in human life are still being investigated, a series of adaptive and nonadaptive explanations are currently found in the literature (Dawkins, 1976; Herzog, 2010; Paul et al., 2014; Serpell, 2003; Serpell & Paul, 2011), such as the cross-species adoption explanation, the theory of hyper-inclusive parental motivation, the theory of sociality motivation, pet keeping as meme, pet keeping as social buffering against stressors, social parasitism theory, honest advertisement of social and parenting abilities, and so on.

Aspects of attachment theories and anthropomorphic thinking, sometimes approached individually or in an embedded manner (i.e., attachment as part of anthropomorphic thinking), can be found in all the explanatory frames listed above, referring to characteristics of both humans and animals (Epley, Waytz, Akalis, & Cacioppo, 2008; Paul et al., 2014; Serpell, 1996). Anthropomorphic thinking, that is, the phenomenon of attributing to animals human mental (and physical) capacities, as well as perceiving them in terms of human-like qualities (Paul et al., 2014), has started to be analyzed from a functional perspective in terms of the evolution of the human-animal bond. Serpell (1996) indicates that pet keeping involves some degree of anthropomorphism,

which is further related in the literature to the ability of the owners to identify and address the needs of their animals in the context of reciprocal beneficial interaction (e.g., Enders-Slegers, 2000; Paul, 2000; Paul et al., 2014). The question arises about the optimal level of anthropomorphic thinking in terms of healthy interactions with the companion animals.

Some studies indicate that high levels of anthropomorphic thinking and behavior might have negative impacts on the well-being of companion animals based on unrealistic expectations regarding their needs (Boni, 2008), for example, physical problems based on selection of baby-face characteristics (Thompson, 1996) or behavioral problems, such as separation distress associated with dependence-based relationships with the owners (Serpell, 2002; Topal, Miklosi, & Csanyi, 1997). But anthropomorphic assumptions, especially that animals think and feel like humans, are widespread in the adults of all cultures that have been investigated (Turner & Al Hussein, 2013). While an increasing number of authors point toward the reconsideration of anthropomorphic thinking in terms of a better understanding of its place in the evolution of human-companion animals interaction, little is known about the connections between low levels of anthropomorphism and pet attachment in the context of functionality of the human-animal bond.

The question of whether animals can become attachment figures for their owners has been raised in multiple studies addressing different categories of age, from children to elderly owners (e.g., Hawkins & Williams, 2017; Julius, Beetz, Kotrschal, Turner, & Uvnäs-Moberg, 2013; Sable, 2013; Serpell, 1996; Serpell & Paul, 2011). Similar to other species, human beings hold a biological predisposition to seek and maintain physical contact and emotional bonds with significant others that offer them physical and psychological protection (Sable, 2013). According to Mikulincer & Shaver (2007), attachments have several characteristics: (1) proximity seeking in times of perceived distress is a preferred way to cope and self-regulate; (2) availability and responsiveness from partners have beneficial effects on the emotional state, self-image, behavior in close

relationships, as well as engagement in personal development; (3) temporary or permanent lack of availability, as well as the loss of the attachment figure, generate intense distress. Bowlby (1982) described the function of the attachment figure to reduce distress and increase emotional comfort and balance as the “safe haven” function, whereas the role of the attachment figure to foster personal development, exploration, risk taking useful for growth, and goal attainment was described as the “secure base” function. Julius et al. (2013) have further developed these human-pet attachment ideas in connection with therapeutic practice.

Several characteristics of companion animals, such as their natural availability for direct physical contact, responsiveness, activism, and affection, represent a strong basis for the attachment bond with the owner (Sable, 2013). Literature indicates that animals are often perceived as a source of emotional support or as loyal companions (Lakatos & Miklosi, 2012), while the loss of a pet can be associated with grief reactions similar to those specific to the loss of a significant person (Field, Orsini, Gavish, & Packman, 2009). Physical proximity or mental activation of the image of the pet may function as a source of comfort and support for the owner and contribute to distress alleviation (Kurdek, 2009; Zilcha-Mano, Mikulincer & Shaver, 2012). The main argument against the idea that a pet can become an attachment figure is the fact that it cannot be a “stronger and wiser” figure for the owner, as Bowlby (1982) mentioned.

Attachment security, an internalized mental representation of the attachment figures as responsive, available in difficult times, is considered a resilience factor and it is associated with better mental health, high-quality relationships, proper emotional self-regulation, and social adjustment in adolescence and adulthood (Kobak, Zajac, & Madsen, 2016). Lack of trust, availability and constancy in relationships, and a history of rejection are associated with attachment insecurity, either anxiety or avoidance in attachment relationships, and in turn associated with vulnerability to mental disorders (Dozier, Stovall-McClough, & Albus, 2008; Mikulincer & Shaver, 2007). In particular, Beetz et al. (2012) have studied the role of

social support by a dog on stress modulation in male children with insecure attachment.

Several studies indicate that the nature and structure of human-animal attachment is similar to interpersonal attachment, as there is a significant association between security and insecurity in human-animal and interpersonal human relationships (Zilcha-Mano, Mikulincer, & Shaver, 2011a; Beck & Madresh, 2008). However, some authors have found lower levels of insecurity in the human-animal attachment relationship compared to the level of insecurity in interpersonal relationships. In particular cases, such as elderly persons and couples without children, the animal can become a substitute for a human being (Bagley & Gonsman, 2005), but this was also associated with a tendency to anthropomorphize the animal, that is, to perceive animals in terms of their human-like qualities and to attribute human mental capacities to them (Paul et al., 2014; Peacock, Chur-Hansen, & Winefield, 2012). *Anxiety in human-animal attachment* (or pet attachment anxiety) was associated with higher emotional distress and poorer mental health, ambivalence, pervasive worry for the integrity of the animal, doubt regarding owner’s worth for the animal (Zilcha-Mano et al., 2011a), and a higher tendency for pathological grief (Davis, 2011). *Avoidance in human-animal attachment* (or pet attachment avoidance) was associated with lower emotional distress, a relative indifference toward the animal’s integrity and needs (Konok et al., 2015), negative expectancies regarding the animal, lower level of trust in the animal, and a tendency to distance oneself from the animal (Zilcha-Mano et al., 2011a).

While several studies support the idea that companion animals are capable of offering features of secure attachment for children, which can be facilitated by encouraging children to participate in the pets’ care (Hawkins & Williams, 2017), the authors point out that pets might satisfy several attachment functions, but are unlikely to fulfill all functions of secure interpersonal attachment. Several variables, from individual to social environment characteristics (family, peers, educational system, societal values, etc.), have been investigated as factors related to the development and the dynamics of human-animal attachment, such as gender—with women proving to

have a stronger emotional connection to pets than men (Quinn, 2005); life cycle—with higher emotional bonds with pets in young couples and couples in the “empty nest” cycle; in persons who were never married and widowers (Albert & Bulcroft, 1988); and type of animal owned—with mixed results showing that horses, dogs, and cats can become attachment figures (Potter & Mills, 2015; Quinn, 2005; Topal & Gacsi, 2012; Zasloff, 1996).

Inspired by Bowlby's definition of attachment as a lasting psychological connectedness between two living beings (Bowlby, 1982, cited in Woodward & Bauer, 2007), it was hypothesized that, for human-pet attachment to occur, this should be supported by an isomorphic behavioral structure with a common function in both species, such as, for example, parental behavior. Along the same line, Woodward and Bauer (2007) consider that matching of the owner's and pet's needs and personality has a predictive value for human-animal attachment. Further, general level of pet attachment was found to be positively associated with the level of empathy toward animals and with the level of interpersonal empathy (Khalid & Naqvi, 2016), as well as with anthropomorphic thinking (Serpell, 2003; Duvall Antonacopoulos & Pychal, 2010), with higher attachment bonds in persons with a tendency to anthropomorphize the animals. Anthropomorphic thinking has been found to be positively associated to empathy to animals (empathy is generally defined as the ability to perceive, identify, and share in another being's emotional state; Eisenberg, 2000), and they are both factors that can predict favorable attitudes and behavior toward animals (e.g., Apostol, Rebeaga, & Miclea, 2013; Hills, 1993).

Starting from evidence-based theories of interpersonal relationships in humans, instruments for measuring indicators of human-animal attachment are continuously being developed and adapted in order to identify the optimal explanations for the physiological and psychosocial effects on the well-being of both humans and animals (Anderson, 2007; Meehan et al., 2017; Zilcha-Mano et al., 2012). While most of the instruments offer a general assessment of the level of attachment toward the companion animals, tools have been recently developed with subscales

that distinguish between the avoidance and anxiety dimensions of human-animal attachment (e.g., Zilcha-Mano et al., 2012), similar to the dimensions identified in human interpersonal relationships (Fraley, Waller, & Brennan, 2000).

The aim of the current study is to investigate the associations between the interpersonal and pet dimensions of attachment (anxiety and avoidance), empathy toward animals, and anthropomorphism in owners of several types of animals, predominantly dogs. The investigation was performed in the Romanian cultural context, where dilemmas regarding the effectiveness of pet management programs are still being reported (Rusu, Pop, & Turner, 2018) and the use of attachment-based intervention in clinical practice is in its early years. Bowlby's attachment theory (1982) was used as the main theoretical background, while instruments were specially selected to assess two dimensions of attachment (anxiety and avoidance) both in interpersonal human relationships (Fraley et al., 2000) and in human-animal bonding (Zilcha-Mano et al., 2011a).

The following hypotheses are proposed: (1) Demographic characteristics such as gender, type, and number of companion animals owned will be reflected in the analyzed variables (interpersonal attachment, attachment toward pets, empathy toward animals, and anthropomorphism). (2) There will be positive associations between the scores on interpersonal attachment avoidance and pet attachment avoidance, respectively, between the scores on interpersonal attachment anxiety and pet attachment anxiety. (3) Positive associations will be found between the level of anthropomorphism and empathy toward animals. Additionally, exploratory analyses will be performed in order to identify significant mediation relationships between interpersonal and pet attachment (anxiety and avoidance), anthropomorphism, and empathy toward animals.

## Methods

### Participants

This research was conducted with the voluntary participation of 244 adult respondents from Romania,

aged between 17 and 66 years ( $32.9 \pm 9.7$ ), mostly females (89.8%), animal owners (84.4%), college graduates and postgraduates (88.5%), single (59.4%), and some with human-animal interaction-related training (25.4%), such as an animal psychology course (undergraduate level) or animal-assisted therapy training (postgraduate level). The participants were recruited via social media networks and motivated to participate with various motivational messages posted online by the authors.

### *Instruments and Procedure*

The variables addressed in the study, as well as the instruments used for the assessment of each of the variable, are presented below:

1. Empathy towards animals—This variable was assessed using the Animal Empathy Scale (AES; Paul, 2000), which is widely used as a unidimensional measure of empathy toward animals. Inspired by the Measure of Emotional Empathy (QMME; Mehrabian & Epstein, 1972), AES is an instrument with 22 items, which can be answered on a 6-point Likert scale ranging from “completely disagree” to “fully agree.” In this study, the Cronbach’s alpha value of the AES was .79, which yields an acceptable reliability of the instrument for this specific group of participants.
2. Attachment to companion animals (pet attachment)—This variable was assessed using the Pet Attachment Questionnaire (PAQ; Zilcha-Mano et al., 2011a). The PAQ is an instrument with 26 items that assesses the individual differences on the two dimensions of pet attachment (anxiety and avoidance). The PAQ was developed based on the Emotions in Close Relationships–Revised form (Fraley et al., 2000), which is one of the most widely used assessment instruments of interpersonal attachment in adulthood. In this study, a Cronbach’s alpha of .71 was found for the avoidance dimension (i.e., acceptable degree of reliability of the avoidance subscale) and a value of .81 for the anxiety dimension, which indicates a good degree of reliability.
3. Anthropomorphism—This variable was assessed using the Anthropomorphism Scale Interview (Albert & Bulcroft, 1988). The scale contains 10 items, which were developed based on an interview targeting pet attachment and further refined based on factor analysis as a distinct dimension reflecting feelings toward the pets that reflect a tendency to attribute human features to nonhuman animals. A Cronbach’s alpha of .74 was found in our study, yielding an acceptable reliability of the scale.
4. The variable “interpersonal adult attachment”—This variable was assessed using the Experiences in Close Relationships–Revised instrument (Fraley et al., 2000, translated into Romanian by Skolka, 2009). This instrument has 36 items investigating the two dimensions of adult attachment: anxiety and avoidance in interpersonal relationships. Avoidance is generally associated with independence and discomfort with intimacy, and anxiety with fear of rejection and abandonment by intimate partners. In the current study, a Cronbach’s alpha of .93 was calculated for the anxiety dimension and a value of .92 for the avoidance dimension, indicating excellent psychometric properties of the instrument.
5. Demographic information on the owners—age, gender, level of education, type and numbers of current companion animals, and the existence of previous training in the field of human-animal interactions (education and/or research).

The answers were collected online by using the ECAS–EUSurvey Platform (<http://ec.europa.eu/eusurvey>), which is one of the official research management tools of the European Commission. An informed consent was conceived for the research, so that all of the participants were aware of the amount of time needed to complete all the scales, as well as the general purpose of the research. Data were collected between December 2016 and February 2017. All statistical analyses were conducted in SPSS



v. 20. Nonparametric tests were performed after checking for the normality of the distribution of the sample data.

## Results

The comparative analysis of the targeted variables (pet and interpersonal attachment, anthropomorphism, and empathy toward animals) based on the demographic characteristics of the owners indicates several significant differences, as shown in Table 1.

In terms of gender differences between the pet owners, the results indicate that female owners scored higher in empathy toward animals (Mann-Whitney  $U$ ,  $z = 3.621$ ,  $p < .001$ , see Table 1) and in the level of anthropomorphism (Mann-Whitney  $U$ ,  $z = 3.115$ ,  $p < .001$ ) than did male owners, who scored slightly higher in pet attachment avoidance (Mann-Whitney  $U$ ,  $z = 1.988$ ,  $p < .05$ ). Significant differences were found based on the type of animal owned (Table 1). Hence, compared to other pet owners (e.g., cats, rabbits, birds, fish), dog owners scored higher in empathy toward animals (Mann-Whitney  $U$ ,  $z = 3.186$ ,  $p < .001$ ), lower in pet attachment avoidance (Mann-Whitney  $U$ ,  $z = 2.616$ ,  $p < .01$ ), and higher in anthropomorphism (Mann-Whitney  $U$ ,  $z = 6.630$ ,  $p < .001$ ).

With regard to the number of owned pets, comparisons were made between the scores of the participants that had one animal, more than one animal (all mammals), and more than one animal from different species, for example, birds, fish, reptiles. No significant differences were found between

**Table 1.** Means and standard deviations (in parentheses) of the scores for the variables AE = animal empathy, PANx = pet attachment anxiety, PAv = pet attachment avoidance, Anthr = anthropomorphism, IAnx = interpersonal attachment anxiety, IAv = interpersonal attachment avoidance.

	M (SD)					
	AE	PANx	PAv	Anthr	IAnx	IAv
Gender						
Female	91.84 (8.5)***	34.02 (11.5)	18.05 (5.5)	30.83 (4.5)***	46.52 (22.4)	45.68 (20.4)
Male	84.68 (9.9)	33.64 (11.2)	22.32 (11.3)*	27.16 (5.6)	47.48 (24.1)	44.44 (18.2)
Level of education						
High school	88.68 (7.5)	40.04 (12.2)*	18.36 (5.5)	31.36 (4.4)	51.68 (23.3)	49.61 (23.8)
Higher education (college)	91.63 (7.7)	33.61 (11.4)	17.77 (5.2)	30.34 (4.5)	42.62 (23.5)	45.84 (20.1)
Postgraduate education	91.08 (10.9)	32.53 (10.7)	19.69 (8.3)	30.34 (5.2)	43.31 (20.3)	43.71 (18.9)
Marital status						
Single	90.68 (8.7)	34.88 (11.6)	18.82 (6.9)	30.41 (4.8)	49.22 (22.7)**	46.62 (19.5)
In a couple relationship	91.74 (9.3)	32.66 (11.1)	18.01 (5.8)	30.53 (4.6)	42.81 (21.8)	43.98 (21.1)
Dog owner (versus other pets)						
Yes	92.40 (7.68)***	33.83 (11.1)	17.64 (5.2)	32.01 (3.7)***	46.25 (21.9)	47.33 (21.6)
No	88.58 (10.4)	34.09 (12.2)	20.13 (8.1)**	27.62 (5.1)	47.48 (23.9)	42.71 (17.1)

\*Significant at the .05 level (2-tailed). \*\*Significant at the .01 level (2-tailed). \*\*\*Significant at the .001 level (2-tailed).

the owners of one pet and owners of several pets on the levels of pet attachment (avoidance:  $\chi^2 = 3.651$ ,  $p > .05$ , and anxiety:  $\chi^2 = .520$ ,  $p > .05$ ), empathy toward pets ( $\chi^2 = 1.260$ ,  $p > .05$ ), or anthropomorphism ( $\chi^2 = 3.796$ ,  $p > .05$ ). No differences in the levels of pet anthropomorphism ( $\zeta = .756$ ,  $p > .05$ ), empathy ( $\zeta = .993$ ,  $p > .05$ ), and pet attachment (pet anxiety:  $\zeta = .120$ ,  $p > .05$ , pet avoidance:  $\zeta = .302$ ,  $p > .05$ ) were found between the participants that had participated or not in trainings related to the field of human-animal interactions. In terms of the general level of education of the pet owners, our data indicate that participants with a lower level of education (high school) scored slightly higher on their level of pet attachment anxiety compared to those with a higher level of education, postgraduate (Table 1, chi-square,  $\chi^2 = 8.320$ ,  $p < .05$ ).

In terms of marital status, no significant differences were found between single participants and those involved in a couple relationship in terms of animal empathy (Mann-Whitney  $U$ ,  $z = 1.393$ ,  $p > .05$ ), pet anxiety (Mann-Whitney  $U$ ,  $z = 1.511$ ,  $p > .05$ ), pet avoidance (Mann-Whitney  $U$ ,  $z = .914$ ,  $p > .05$ ), and the level of anthropomorphism (Mann-Whitney  $U$ ,  $z = .065$ ,  $p > .05$ ).

Pearson correlation analyses were performed between the scores of the pet owners on the anxiety and avoidance dimensions of interpersonal and pet attachment questionnaires (Table 2). The results indicate a highly significant correlation between pet attachment anxiety (PANx) and interpersonal attachment anxiety (IANx),  $r = .389$ ,  $p < .01$ ) and a more

modest, yet statistically significant, positive correlation between pet attachment avoidance (PAv) and interpersonal attachment avoidance (IAv),  $r = .16$ ,  $p < .05$ , Table 2). While a significant positive correlation was found between the anxiety and avoidance dimensions of interpersonal attachment ( $r = .494$ ,  $p < .01$ ), no significant correlation was found between the two dimensions of pet attachment.

The level of anthropomorphism was positively associated with the level of pet attachment anxiety ( $r = .452$ ,  $p < .01$ ), positively associated with the level of empathy toward animals ( $r = .452$ ,  $p < .01$ ), and negatively associated with the level of pet attachment avoidance ( $r = -.463$ ,  $p < .01$ ). A significant negative correlation was found between the level of empathy toward animals and the pet attachment avoidance ( $r = .485$ ,  $p < .01$ ), that is, the higher the level of empathy to animals, the lower the level of pet attachment avoidance. In our sample, no significant correlations were found between empathy toward animals and the levels of anxiety and avoidance in interpersonal attachment.

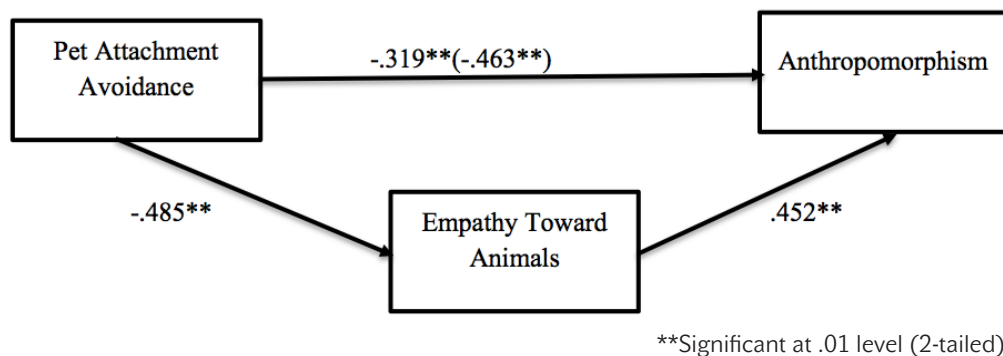
Based on the results of the correlation analyses (Table 2), corroborated with results from previous studies (e.g., Zilcha-Mano et al., 2012), the relationships between pet attachment avoidance, anthropomorphism, and empathy toward animals were further tested. We hypothesized there would be a mediation effect of empathy toward animals in the relationship between pet attachment avoidance and anthropomorphism. The mediation model was tested following the steps described by Baron and

**Table 2.** Correlation matrix between the variables included in the analysis.

	EA	PANx	PAv	Anthr	IANx	IAv
Empathy toward animals (EA)	1					
Pet attachment anxiety (PANx)	.027	1				
Pet attachment avoidance (PAv)	-.485**	-.077	1			
Anthropomorphism (Anthr)	.452**	.406**	-.463**	1		
Interpersonal attachment anxiety (IANx)	-.043	.389**	.248**	.069	1	
Interpersonal attachment avoidance (IAv)	-.120	.157*	.163*	.072	.494**	1

\*Correlation is significant at the .05 level (2-tailed). \*\*Correlation is significant at the .01 level (2-tailed).





**Figure 1.** Partial mediation of EA (Empathy toward Animals) on the causal relationship between PAv (Pet Attachment Avoidance) and Anthr (Anthropomorphism).

Kenny (1986), using the estimation of a series of three regression models (Figure 1).

When controlling for the variable empathy toward animals, the effect of pet attachment avoidance on anthropomorphism slightly decreases, though it remains significant. Therefore, in our sample of Romanian pet owners, empathy toward animals has a decreasing effect on the relationship between pet attachment avoidance and the level of anthropomorphism.

## Discussion and Conclusions

Several studies on attitudes toward animals have been performed in Romania in the last 10 years, all of them indicating a high level of favorability toward animals, especially toward pets (Apostol et al., 2013; Cocia & Rusu, 2010; Rusu et al., 2018). Empathy toward animals and anthropomorphic thinking, as well as the gender of the owners were identified as predictors of favorable attitudes toward animals in a large sample of respondents in Romania (Apostol et al., 2013). Despite the increasing number of NGOs promoting the adoption of stray animals, as well as humane education programs in the area of management of human-animal interactions, cases of pet abandonment and abuse toward animals are still reported in that country (Rusu et al., 2018). This situation might be explained by the lack of national early childhood education programs addressing the optimal interaction with animals. Such programs are very rare in Romania and are mainly performed

under the umbrella of animal-assisted activities like school visitation programs or those targeting the socioemotional development of children with special needs (Rusu, 2017).

With regard to adult pet owners in general and in Romania in particular, we consider that an important step in preventing animal abuse (as well as the development of behavioral problems in pets) and pet abandonment is the identification of those factors related to favorable attitudes and behavior toward animals that can be shaped through education and/or psychological counseling. In light of this, the objective of the current study was to investigate the associations between the interpersonal and human-animal dimensions of attachment (anxiety and avoidance), empathy toward animals, and anthropomorphism in owners of several types of pets, predominantly dogs and cats. The investigation was performed in the Romanian cultural context, where discussions regarding the effectiveness of pet management programs are still continuing (Rusu et al., 2018) and the use of attachment-based intervention in clinical practice is in its early years. In this study, Bowlby's attachment theory (1982) was drawn upon as the main theoretical background, while instruments were specially selected to assess the two dimensions of attachment (anxiety and avoidance) both in interpersonal human relationships (Fraley et al., 2000) and in human-animal bonds (Zilcha-Mano et al., 2011a).

In line with previous studies (e.g., Smolkovic, Fajfar, & Mlinaric, 2012; Winefield et al., 2008), the

current data support the gender differences between the pet owners in that female owners scored higher in empathy toward animals and in their level of anthropomorphism. Regarding the type of pet, Romanian dog owners scored higher than the owners of other pets (e.g., cats, rabbits, birds, reptiles) in empathy toward animals. Also, compared to the owners of other types of pets, dog owners had lower scores in pet attachment avoidance and higher scores in the level of anthropomorphism. These results are supported by explanations offered in the literature regarding the implications and demands of canine companionship in the context of the current lifestyle of most dog owners (Boni, 2008; Smolkovic et al., 2012). Hence, dog owners will often manifest instrumental types of anthropomorphic behaviors in relation to their own lifestyles, for example, lobbying for dogs to have access to public transportation and public places (Boni, 2008). One can conclude that, in our sample, in which most of the dog owners had a high level of education and were currently employed in urban areas, the high level of anthropomorphism expressed by the respondents might reflect their lifestyle.

Although no significant differences were found in the level of the targeted variables between participants who attended human-animal interaction training and those who did not, in terms of the general level of education, our data indicate that the pet owners with a lower level of education (high school) scored slightly higher on their level of pet attachment anxiety compared to those with a higher education level, that is, college. One possible interpretation is that the level of education might shape expectations about the relationship with the animals, which might lower the level of anxiety in the interactions with the pet. This interpretation needs further investigation.

In the current study, the level of anthropomorphism was positively associated with the level of pet attachment anxiety of the pet owners and negatively associated with the level of pet attachment avoidance. While the results are in line with previous research showing a link between pet attachment and anthropomorphism (e.g., Duvall Antonacopoulos & Pychyl, 2010; Meehan et al., 2017; Serpell, 2003), the added value brought by our data is represented by

the distinction between the pet attachment anxiety and avoidance dimensions. As has been discussed in previous studies, an unsuitable level of anthropomorphism might be harmful to the well-being of the companion animals, as that can lead to mistreatment and neglect of the animal's needs or behavioral problems (e.g., Thompson, 1996; Topal et al., 1997). Therefore, various measures to modify the level of anthropomorphizing behaviors up to a normatively moderate level would be useful. Nevertheless, these types of behaviors are difficult to change.

While a significant positive correlation was found between the anxiety and avoidance dimensions of interpersonal attachment, no significant correlation was found between the two dimensions of pet attachment, which might indicate that the two dimensions of human-pet attachment reflect rather distinct aspects in terms of the relationship that the owners have with their pets. In this sample of Romanian pet owners, a negative association was found between pet attachment avoidance and empathy toward animals. As shown in the literature in the field of attachment, avoidant individuals in interpersonal relationships also tend to be less empathic in interpersonal relationships (e.g., Khalid & Naqvi, 2016); based on the results of the current study, one can conclude that this might be also the case in human-pet relationships.

A partial mediation of the relationship between pet attachment avoidance and anthropomorphism by empathy toward animals was found. When controlling for empathy toward animals, the effect of attachment avoidance on anthropomorphism slightly decreased, though it remained significant. Therefore, empathy toward animals had a decreasing effect on the relationship between attachment avoidance and anthropomorphism. This result is promising in that it shows that, by modifying the level of animal empathy, an influence might be obtained on anthropomorphic behavior toward animals in avoidant owners, which can in turn help with the problematic features that avoidant individuals bring into the relationship with the pet, such as emotional distance from the pet, the risk of neglect, and attention to the pet's needs for care and affection. In the

human-animal interaction (HAI) literature, pet attachment avoidance was related to the development of separation anxiety in dogs and other behavioral problems (Konok et al., 2015), due to the lack of the owner's ability to function as a secure base for the animal.

In conclusion, the results of this study support the idea that programs aiming at increasing empathy toward animals have the potential to influence human-animal attachment avoidance, with impact on anthropomorphizing behaviors and consequently on the functionality of human-animal relationships. Several examples of efficient humane education programs in terms of increasing the level of empathy toward animals have been reported in the literature, most of them primarily targeting the development of favorable attitudes and behaviors toward animals (Ascione, 2001; Faver, 2010; Nicoll, Trifone, & Samuels, 2008; Thompson & Gullone, 2005). In Romania, dog-assisted humane education programs have begun to be tested in some primary schools, indicating significant positive impacts on empathy and attitudes toward animals in children, but with no assessment of human-animal attachment (Rusu & Mihalache, 2013; Tulpan, Cuzum, & Velcu, 2009). Hence, another conclusion supported by our current results is that, in Romania, the optimization of training in animal-assisted activities and therapy, as well as intervention programs addressing responsible ownership and well-being of animals (and of their owners), should include the attachment component.

Recent studies investigating the human psychological predictors of pet adoptions in shelter visitors (Green, Coy, & Mathews, 2018) indicate that attachment anxiety and avoidance may influence not only the decision to adopt a pet or not, but also the nature of the human-animal relationship (e.g., time spent with the pet, perceived security of the bond with the pet, etc.). Hence, along with the support offered by this recent literature on attachment anxiety and avoidance as predictors of the decision to adopt an animal, the findings of the current study on pet owners in Romania might also provide useful

recommendations for planning short-term and low-cost educational programs (e.g., online and printed materials, workshops, public seminars targeting empathy toward animals) at public and private animal shelters, which have increased in number in Romania in the last decade.

## Summary for Practitioners

The effectiveness of pet management programs has been questioned in Romania, where this study was conducted, as well as in several other countries. With regard to adult pet owners in general and in Romania in particular, we believe that an important step in preventing animal abuse and pet abandonment is the identification of those factors related to favorable attitudes and responsible behavior toward animals that can be shaped through education and/or psychological counseling. Even though the use of attachment-based intervention in clinical practice is in its early years, we have investigated the associations between interpersonal and pet attachment (both the anxiety and the avoidance dimensions), empathy toward animals, and anthropomorphism in the Romanian cultural context. A sample of 244 adult respondents, with a mean age of 32.9 years, mostly females (89.8%) and pet owners, completed standard instruments to assess interpersonal and pet attachment, empathy toward animals, and anthropomorphism. In agreement with other studies in the field of human-animal interactions, our data indicate that female pet owners in the current sample scored higher than male owners in empathy toward animals and the level of anthropomorphism. Dog owners scored higher in empathy toward animals and level of anthropomorphism, and lower in pet attachment avoidance compared to owners of other types of pets (mostly cats). Our data indicate significant positive correlations between anxiety and avoidance dimensions of pet and interpersonal attachment.

The level of anthropomorphism was positively associated with pet attachment anxiety and empathy toward animal, and negatively associated with

pet attachment avoidance. This may be interpreted as follows: In some cases animals can become emotional substitutes for people, especially for those with a higher preoccupation with separation and abandonment and anxious attachment, which in turn also attend more to the needs of the pets. Further, persons with higher tendency to distance themselves from others in significant interpersonal relationships (i.e., persons that score higher on avoidance) tend to be less attuned to the needs of pets. As pointed out in the literature, an optimal level of anthropomorphism is beneficial to the functioning of human-animal interactions, as it is related to higher sensitivity toward the needs of the animal. A partial mediation of the relationship between pet attachment avoidance and anthropomorphism by empathy toward animals was found in the current study, meaning that by increasing either the cognitive or the emotional awareness of avoidant persons toward the features of the animals, this could lead not only to a potential increase of their ability to perceive the animals as having feelings and mental capacities, but to an increase of their ability to identify, address, and care for the needs of the animals. This, in turn, would foster the development of a healthy relationship and the occurrence of beneficial effects for both humans and animals. Results are discussed from the perspective of considering empathy toward animals as an important variable to be addressed in humane education programs and in attachment-based counseling of current and future pet owners.

In terms of applied value to psychological counseling and psychotherapeutic interventions, it has been recognized that the presence of an animal in the therapy room (e.g., a therapy dog, the psychotherapist's dog, the client's pet, etc.) could be beneficial to the dynamics of the therapeutic relationship, strengthening the client's security and the communication between the therapist and the client (e.g., Chandler et al., 2010; Zilcha-Mano, Mikulincer, & Shaver, 2011b). In line with these ideas, our study shows that empathy toward animals is an important component of the relationship in both anxious and avoidant pet owners. Moreover, empathy partially mediates the

association between attachment avoidance and anthropomorphism, meaning that by increasing empathy toward animals, the person's ability to reflect on the emotional and mental skills of the animal also increases. This idea could have important implications for clinical practice, especially for clients with attachment insecurity, who tend to have diminished abilities to reflect on their own and others' mental states. The emotional experiences associated with positive human-animal interactions could be corrective in terms of the person's functioning, and these corrective experiences could further be extrapolated to other close interpersonal relationships, thus fostering the acquisition of more functional relational patterns.

With respect to counseling with the purpose of animal health care for owners, our study shows that people differ in terms of their rapport with animals, depending on their attachment style. While anxiously attached individuals tend to be more empathic toward animals, but also anthropomorphize their pets to a higher extent, avoidant persons tend to have lower levels of empathy and a lower tendency to anthropomorphize the animals. We therefore suggest that programs should be designed to address these issues differently: for anxiously attached persons with messages targeting the increase of their security in the relationship with the animal (e.g., loyalty of the pet, respect for owner, willingness to stand by owner's side if properly cared for, etc.), for avoidantly attached persons with messages destined to increase empathy and anthropomorphism (e.g., animals are beings with their own needs and feelings, they can suffer if mistreated, they have a will of their own, etc.).

In conclusion, the results of this study support the idea that programs aiming to increasing the level of empathy toward animals have the potential to influence human-animal attachment avoidance, with impact on anthropomorphizing behaviors and consequently on the functionality of human-animal relationships. Another important conclusion supported by our results is that in Romania, the optimization of training (e.g., humane education programs) and intervention programs addressing responsible

ownership and the well-being of animals and their owners should include the attachment component.

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