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## CHILDREN PET OWNERSHIP: ATTACHMENT TO PARENTS AND PSYCHOLOGICAL ADJUSTMENT

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### *Abstract*

*The purpose of this study was to investigate whether the presence of a pet at home influences children's attachment to their parents and psychological adjustment. A convenience sample of 276 participants (48.9% of whom owned of a dog or dogs; 138 children with a mean age of 8.79 years and 138 parents with a mean age of 40.37 years) was used. Two multivariate analyses of covariance (MANCOVAs), controlling for parent's age, were performed to analyze the data. The MANCOVA results show lower levels of attachment to the mother and father in children with pets compared to children without pets. Additionally, compared to children without pets, children with pets scored lower in emotional symptoms and conduct problems and higher in prosocial behavior. These findings suggest that the presence of a pet could correlate with less perceived security in the attachment relationship with parents, probably because pets are often adopted into families with children to compensate for loneliness or closeness. However, according to the literature, the presence of a pet in itself seems to be a protective factor for a child's psychological development. Limitations and future research perspectives are described.*

Keywords: attachment to parents; pet; children's adjustment; human-animal interaction

### **Introduction**

The present study aims to offer an Italian contribution to an expanding area of research on the presence of a pet in the family nucleus and its impact on the psychological adjustment of children. To this end, we tested whether the presence of a pet, especially a dog, is associated with less attachment to parents and greater psychological well-being in children. In Italy, an estimated 5.9 million families (or 27% of Italian families) own a dog, the Italian population's most preferred pet (Assalco-Zoomarket Report, 2019; Euromonitor, 2018). Thus, dogs have become not just pets but integral parts of many Italian

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families. Considering that the presence of a pet in the household can contribute to the psychological well-being of the family (Serpell & Paul, 2011), it is important to extend our knowledge of the potential influence that the presence of a dog has on children's socioemotional development, moving from the theoretical perspective of attachment.

*Pet ownership and developmental outcomes*

Although the literature is inconsistent and not always in agreement (Bures et al., 2019; Duenas et al., 2021; Jacobson & Chang, 2018; Purewal et al., 2017), several pieces of evidence suggest that pet ownership contributes to the psychological development of children and adolescents. For children, pet ownership appears to be associated with higher levels of empathy and prosocial behavior (Daly & Morton, 2006, 2009; Duenas et al., 2021; Svensson, 2014; Vidovic, 1999), greater self-esteem (Covert, 1985; van Houtte, 1995), reductions in anxiety and perceived stress (Arambasic et al., 2000; Covert, 1985; Gadamaski et al., 2015), and a decreased sense of loneliness (Black, 2012). Pet ownership also appears to affect cognitive development and educational outcomes (Prokop, 2008; Purewal et al., 2017; Svensson, 2014). Additionally, compared to other animals, owning a dog seems to be more strongly associated with empathy and prosocial skills (Daly & Morton, 2006). This could be because dogs seem to demonstrate more human-like communication behaviors than other animals. Pet ownership, and especially dog ownership, can influence a child's well-being and development in several ways. For instance, play stimulates physical activity and provides opportunities for exploration and independence; pet ownership promotes empathy and responsible and caring attitudes; it stimulates verbal and nonverbal communication, provides emotional support, and reduces stress; the pet serves as a confidant; and pet ownership promotes positive relationship building and closeness (Gadamaski et al., 2015).

Some data return us to the characteristics of families most frequently found to be pet owners. In these families, it appears that children are often only children or have no younger siblings (Fifield et al., 1999; Paul & Serpell, 1992), single parents predominate (Marsa-Sambola, 2016), and the parent(s) tend(s) to work full- or part-time (Marsa-Sambola, 2016; Melson, 1988). In addition, some data suggest that child dog owners come from more deprived socioeconomic backgrounds (Fifield et al., 1999; Westgard et al., 2013). Thus, it is possible that parents provide children with a pet to compensate for isolation and loneliness or that children themselves request a dog to meet their own needs for companionship and closeness (Fifield et al., 1999). Considering that the request or motivation for adopting a dog in the presence of a child could often be a need to dampen a feeling of loneliness, we wondered if the presence of a pet dog could be somehow connected to perceived security in the child's relationship with the parent(s).

*Children's attachment to humans and pet*

According to attachment theorists (Ainsworth, 1989; Bowlby, 1969, 1973), a child is biologically predisposed to forming an emotional bond with a human caregiver to ensure closeness, protection, and survival. The child, therefore, asks for closeness and satisfaction of their physical, emotional, and relational needs from their caregiver. The child can also use their human caregiver as a “safe base” for exploration, evoking a response of emotional and physical support in case of need, stress, or danger in the child. In the presence of a warm, responsive, and sensitive relationship, the child can use the parent as a secure base and derive from this experience a positive self-representation and positive relationships with others, developing a relational model that will guide future relationships. In this direction, secure attachment seems to be a predictor of a child's good psychological adjustment (Brumariu et al., 2018; Demby et al., 2017; Granot et al., 2001) and associated with less occurrence of behavioral disorders (Madigan et al., 2016) and greater emotional regulation (Cook et al., 2019), self-esteem, empathy, and prosocial relationships (Brumariu et al., 2018; Groh et al., 2014; Li et al., 2021). Conversely, poor perceived safety in relationships with caregivers tends to be associated with worse developmental outcomes, dysfunctional relationships, and psychopathological symptoms (Badenes-Ribera et al., 2019; Groh et al., 2012; Longobardi & Badenes-Ribera, 2017; Prino et al., 2019; Roelofs et al., 2006; Schimmenti & Bifulco, 2015). The effects of perceived safety in the child-caregiver relationship appear to impact the child's psychological adjustment in the short and long terms (Brumariu et al., 2018). Yet despite the importance of the relationship with one's parents, research suggests that a child is capable of developing multiple attachments and can, thus, form secure attachments even with non-parental figures (Ahnert et al., 2006; Lin et al., 2021; Longobardi et al., 2016; 2017, 2021), including with pets (Hawkins et al., 2017; Melson et al., 1991; Zilcha-Mano et al., 2011, 2012).

A growing body of evidence shows that dogs might serve as attachment figures for children and that their presence might also compensate for some deficiencies in attachment relationships with parents (Carr & Rockett, 2017; Hawkins et al., 2017; Zilcha-Mano et al., 2012). In fact, a dog may serve as a secure base, encouraging a child to explore the environment and providing feelings of proximity, closeness, and support and an emotional bond. Adults and children evaluate pets as consistent sources of emotional support on par with family and friends (Kurdek, 2008; Meehan et al., 2017), with those who demonstrate more intense attachment to the animal rating their pet higher in their attachment hierarchy than those less attached (Meehan et al., 2017). Of course, the pet cannot fulfill all attachment needs, but it can facilitate human relationships and re-establish secure attachment with others, particularly where other attachment figures are absent or where human attachment relationships are disrupted (Carr & Rockett, 2017; Hawkins et al., 2017; Strand, 2004).

Very interestingly, some authors have shown that in adult pet owners, a feeling of loneliness correlates strongly with a positive attitude toward pets and a stronger desire for parenthood (Krause-Parello et al., 2014). According to these authors, the data suggest that adult pet owners may seek to compensate for loneliness through a relationship with a dog. The dog would allow them to experience a greater sense of attachment, feel a sense of safety and security, and provide an opportunity to extend their network of social contacts to people with interests and concerns compared to their respective pets. In addition, the relationship with the dog would reduce loneliness and foster the development of caring and protective skills that would prepare them for eventual parenthood. Green et al. (2018) suggested that the attachment theoretical matrix may be useful in explaining the motivation to adopt a pet and the choice of pet. According to Green et al., an adult with insecure attachment has a smaller social network of friends and acquaintances and would tend to adopt a pet to create opportunities to extend their social network or turn to their pet as a replacement for human companionship. Overall, these data suggest that pet-owning adults may be characterized by loneliness and relational deficits that could affect a relationship with a child by making it seem less secure (Bullock, 1993; Şahin-Bayraktar et al., 2020). More generally, evidence suggests a possible intergenerational transmission of secure and insecure attachment (van IJzendoorn et al., 2019), and several animal-assisted therapy interventions are prescribed to intervene in attachment deficits in children (Pari-Plass, 2008; Zilcha-Mano et al., 2011). In this direction, a pet dog could be considered a coping tool with respect to such relational deficits and may become a source of attachment, support, and closeness for the child and likely also for other family members, promoting greater family well-being.

### **Objective**

The literature on human-animal relationships seems to be expanding, but little is known about the effects of the presence of a domestic animal on children's psychological development. This limitation is felt particularly in Italy, where there seem to be no studies in this direction. Yet more than a quarter of Italian families adopt a pet, with the dog being the preferred pet. Therefore, the present research is intended to extend our knowledge of the possible correlates of the presence of a pet on children's development, taking into account the perception of security in the relationship with their parents and psychological adjustment. In this research, we focused on a sample in middle childhood because it is during this period of development that children seem to show more interest in pets and parents likely feel more confident in adopting a dog because they may consider children at this age capable of taking care of pets in a more independent and adequate way (Melson, 1988; Paul & Serpell, 1992). Thus, the study addressed the following three research questions:

Research question one: Are there differences in attachment to the mother between children with and without a pet at home?

Research question two: Are there differences in attachment to the father between children with and without a pet at home?

Research question three: Are there differences in adjustment between children with and without a pet at home?

## Method

### *Participants*

We conducted a cross-sectional study using a convenience sample. The sample comprised 276 participants (138 children and 138 parents), who volunteered to participate in the study without compensation. Among them, 48.9% owned a dog or dogs. The children ranged in age from 7 to 11 years with a mean age of 8.79 years ( $SD=1.37$ ). Most of the children were female (64%) and Italian (99.3%); only one child did not report a nationality. The parents ranged in age from 29 to 55 years with a mean age of 40.37 years ( $SD=5.88$ ). Most of the parents were female (74.1%) and most of them were Italian (97.1%).

There were no statistically significant differences between children with and without a pet in terms of age ( $t(137)=-1.90$ ,  $p=.060$ , Cohen's  $d=-0.32$ , 95% CI [-0.67, 0.02]) and sex ( $\chi^2=0.08$ ,  $p=.779$ , Phi coefficient=.02, 95% CI [-.14, .19]).

Regarding the sampled parents, there were no statistically significant differences between those who had and did not have a pet in terms of sex ( $\chi^2=0.62$ ,  $p=.432$ , Phi coefficient=.07, 95% CI [-.10, .23]) and nationality ( $\chi^2=2.23$ ,  $p=.661$ , Cramer's  $V=.12$ , 95% CI [-.04, .28]), but there was a difference in terms of age ( $t(137)=-3.09$ ,  $p=.002$ , Cohen's  $d=-0.53$ , 95% CI [-0.87, -0.18]). Parents with a pet ( $M=41.9$ ,  $SD=5.81$ ) were older than parents without a pet ( $M=38.9$ ,  $SD=5.60$ ).

### *Measures*

Children and their parents were asked to provide the following background information: current age, biological sex, and nationality. Additionally, children were asked to respond to a self-reported measure related to their attachment to their parents, and the parents were asked to respond to a measure regarding children's adjustment.

Children completed the *Security Scale* (SS; Kerns et al., 1996). The SS is a self-reported measure consisting of 15 items rated on a 4-point Likert scale using Harter's (1982) "Some kid... Other kids..." format, and it measures children's perceptions of security in parent-child relationships in middle childhood and early adolescence. The children were asked to respond to the SS items for the mother (15 items) and father (15 items) separately. Total scores were calculated as the mean of the items. Higher scores reflected more secure attachment to the parent. In the present study, the scores' reliability, measured as internal consistency, was adequate for attachment to the mother ( $\alpha=.69$ ,  $\omega=.73$ ) and the father ( $\alpha=.76$ ,  $\omega=.79$ ).

Parents answered the *Strengths and Difficulties Questionnaire* (SDQ; Goodman, 1997; Italian version: Tobia et al., 2011). The SDQ comprises 25 items scored on a 3-point Likert scale (0=not true, 1=partially true, 2=absolutely true) divided into five dimensions: Emotional Symptoms (5 items), Conduct Problems (5 items), Hyperactivity (5 items), Peer Problems (5 items), and Prosocial Behavior (5 items). The SDQ is a well-validated behavioral screening questionnaire developed using factor analyses and the nosological concepts that underpin the International Statistical Classification of Diseases and Related Health Problems (World Health Organization, 1993) and the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1994) classifications of childhood psychopathology. Parents were asked about their children's adjustment in the last month. The total score was computed as the mean of the items. In the present study, the scores' reliability, measured as internal consistency, was acceptable for Emotional Symptoms ( $\alpha=.57$ ,  $\omega=.59$ ) and Conduct Problems ( $\alpha=.54$ ,  $\omega=.56$ ) and adequate for Hyperactivity ( $\alpha=.73$ ,  $\omega=.74$ ), Peer Problems ( $\alpha=.65$ ,  $\omega=.65$ ), and Prosocial Behavior ( $\alpha=.73$ ,  $\omega=.73$ ).

#### *Procedure*

Several schools in North-West Italy were contacted and consent was obtained from the school director. The children took part in the research anonymously and without rewards only after their parents provided signed informed consent. A psychologist explained the research objectives to the children and administered the anonymous questionnaires in their classrooms. Parents of children completed the questionnaire before the child entered the classroom. The research obtained approval from the Ethics Committee of the University of Turin: protocol number 47503.

#### *Data analysis*

First, exploratory analyses were conducted to examine missing values and the normality of distribution of the continuous variables. Missing values were less than 5% for each variable and, thus, were not considered to cause bias in the estimates (Graham, 2009). Moreover, skewness and kurtosis values were calculated to assess the normality of the data. All the variables were satisfactorily within the conventional criteria for normality (-3 to 3 for skewness and -10 to 10 for kurtosis), according to Kline's (2015) guidelines. Thus, the data were considered to have a normal distribution.

Second, descriptive statistics (means and standard deviations for continuous variables and frequencies and percentages for categorical variables) were computed on the sociodemographic information and variables under study. Then, to compare significant differences in sociodemographic characteristics between pet ownership and no pet ownership, a Chi-squared test or Fisher's exact test were performed on the categorical variables, while the Student's t-test was used for continuous variables. Fisher's exact test was used when the cell count of the categorical variables was lower than five (*i.e.*, nationality). When the

Student's t-test was used, the equality of variance was checked using Levene's test. As the two groups analyzed had equal variance, no corrections to the Student's t-test were required. To measure the magnitude of differences, Cohen's *d* was used as effect size statistics (Cohen, 1988) for the Student's t-test and *Phi* coefficient or Cramer's V was used for the Chi-squared test or Fisher's exact test, respectively.

Lastly, two separate multivariate analyses of covariance (MANCOVAs) were performed to examine if the presence of a pet at home affects parental attachment (SS scores for mother and father separately) and children's adjustment (SDQ dimensions scores). Parent's age was added as a covariate to control any influence it might have on outcomes, since the Student's t-test showed statistically significant differences between parents with and without a pet at home in terms of age. The most robust criterion, Pillai's criterion, was used (Tabachnick & Fidell, 2007), and partial eta squared ( $\eta^2$ ) was estimated. The data were analyzed with IBM SPSS Version 26 for Windows and were interpreted assuming a significance level of 5% ( $\alpha=.05$ ).

## Results

Two MANCOVAs, controlling for parent's age, were performed to determine the effect of having a pet at home on children's attachment to parents and their psychological adjustment scores. Previously, the assumption of homogeneity of covariance was checked using Box's M test (18.4,  $F=6$ ,  $p<.001$  for children's attachment to parents; 31.96,  $F=2.04$ ,  $p=.010$  for children's adjustment). Thus, Pillai's trace was applied instead of Wilk's lambda to examine the multivariate statistical significance.

### *Children's attachment to parents and the presence of a pet at home*

The MANCOVA results reveal a statistically significant effect of the presence of a pet at home on children's attachment to parents (Pillai's trace=0.06,  $F[2, 126]=3.74$ ,  $p=.026$ ,  $\eta^2=.056$ ). Posterior univariate analyses of variance (ANOVAs) show a statistically significant difference between the two groups of children in scores for attachment to the mother and father. Table 1 displays the descriptive statistics for the variables under study for children with and without a pet at home as well as comparisons between the two groups in relation to their outcomes. As Table 1 displays, children with a pet at home show lower levels of attachment to the mother and the father than children without a pet at home.

### *Children's adjustment and the presence of a pet at home*

The MANCOVA results show a statistically significant effect for the presence of a pet at home on children's adjustment (Pillai's trace=0.24,  $F[5, 123]=7.73$ ,  $p<.001$ ,  $\eta^2=.239$ ). Posterior univariate ANOVAs reveal a statistically significant difference between the two groups of children on emotional symptoms, conduct problems, and prosocial behavior scores. As

Table 1 displays, children with a pet at home show lower levels of emotional symptoms and conduct problems and higher levels of prosocial behavior than children without a pet at home.

Table 1. Descriptive statistics of variables under study for the children who had a pet at home and children without pet groups and comparisons between both groups

	Children with pet at home		Children without pet at home		F (Univariate ANOVA)	P	ES ( $\eta^2$ )
	n	M(SD)	n	M(SD)			
Mother attachment	63	3.36(0.40)	67	3.50(0.27)	6.29	.013	.05
Father Attachment	63	3.24(0.41)	67	3.35(0.40)	4.10	.045	.03
Emotional Symptoms	61	2.05(2.03)	69	2.93(2.02)	5.56	.020	.04
Conduct Problems	61	2.20(1.26)	69	2.88(1.57)	9.84	.002	.07
Hyperactivity	61	4.03(1.45)	69	4.10 (1.49)	0.27	.602	.00
Peer Problems	61	4.46(1.09)	69	4.35 (1.55)	0.16	.692	.00
Prosocial Behaviour	61	8.20(1.62)	69	6.68 (2.42)	12.7	.001	.09

Note: M = mean; SD = standard deviation; n = frequency; ES ( $\eta^2$ ): effect size (partial eta squared)

## Discussion

The present study primarily aimed to investigate whether the presence of a pet at home influences children's attachment to parents and psychological adjustment. Findings from the present work indicate that the presence of a pet at home can have an effect on children's attachment to parents. Compared to children without a pet, children who had a pet showed lower levels attachment to the mother and father. To the best of our knowledge, no previous study examined perceived safety in the relationship between child pet owners and their parents. Some evidence has indicated that the motivation to adopt a dog is very often related to loneliness and a need for closeness (Green et al., 2018; Krause-Parello et al., 2014). Some authors have pointed out that adults with insecure attachment are likely to adopt a dog due to a feeling of loneliness or to replace companionship derived from human relationships (Green et al., 2018). These elements of insecurity could influence a child's perception of attachment to parents, causing pet-owning children to perceive less security.

In addition, some studies have suggested that child pet owners tend to be only children with parents who work full- or part-time (Fifield et al., 1999; Marsa-Sambola, 2016; Melson, 1988; Paul & Serpell, 1992), while one finding correlated the number of pets in the family with disadvantaged family circumstances (Fifield et al., 1999). Taken together, these data suggested to us that the family or child might consider a dog a requirement to cope with feelings of loneliness or isolation. Therefore, we hypothesized that pet-owning children might somehow perceive a less secure bond with their parents and that the presence of pets at home might be an indirect indicator of this state. Therefore, we focused on the presence of a pet and not so much on the quality of the relationship with the pet (i.e., the attachment bond). In this regard, the literature has produced evidence that a pet may constitute an attachment figure



for a child (Hawkins et al., 2017; Melson et al., 1991; Zilcha-Mano et al., 2011, 2012) and that this could also compensate for deficiencies in the attachment bond with the parents by compensating for a feeling of security (Melson et al., 1991; Zilcha Mano et al., 2011, 2012). It could also be that the stable presence of a pet, such as a dog, may somehow become a preferred source of affective investment for a child, causing the perception of a less secure bond with the parent. However, further studies with more dimensionally specific instruments may be conducted in the future to answer these hypotheses more pointedly.

Our data further show that children with pets tend to present better psychological adjustment than children without pets, resulting in fewer emotional symptoms, less occurrence of conduct disorders, and more prosocial behavior. We must say that the literature does not always seem to agree on the possible contribution of pets to the psychological well-being of children, adolescents, and adults, and this could be due to methodological factors, such as sample types and instruments used to assess socioemotional outcomes (Jacobson & Chang, 2018). However, several pieces of evidence suggest that the presence of a pet tends to promote better psychological adjustment (Hawkins et al., 2017; Jacobson & Chang, 2018; Purewal et al., 2017), and our data seem to point in this direction. In our sample, children with pets exhibited fewer emotional symptoms than children without pets did. An association between pet ownership and decreased anxiety levels was found in a sample of rural children aged 4-10 years (Gadomski et al., 2015) and a large sample of Croatian youth (Vidovic, 1999). Moreover, Wright et al. (2015) found a reduction in anxiety in children with autism spectrum disorders after the purchase of a pet dog. Crossmann et al. (2019) experimentally detected a reduction in anxiety and increase in positive affect following a brief, unstructured interaction with a non-family dog. Similarly, experiments have demonstrated a significant reduction in anxiety in hospitalized children following a brief pet therapy intervention (Hinic et al., 2019). The presence of a pet could increase emotional well-being through reductions in feelings of loneliness and depressive symptoms and an association with increased self-esteem (Purewal et al., 2017; Van Houtte et al., 1995). Overall, the presence of a pet could offer emotional support, regulate emotions, and reduce stress, resulting in a decrease in emotional symptoms. In addition, the presence of a pet could help increase a child's self-esteem, reduce feelings of loneliness, and increase physical activity, indirectly increasing emotional well-being (Hawkins et al., 2017; Purewal et al., 2017; Van Houtte et al., 1995).

Finally, the better psychological adjustment of children with pets compared to children without pets was demonstrated by an increase in prosocial behaviors and a decrease in conduct disorders in child pet owners in our sample. Some previous research has reported an association between the presence of a pet and increases in empathy and prosocial behaviors (Daly & Morton, 2006, 2009; Duenas et al., 2021; Svensson, 2014; Vidovic, 1999). It is possible that through the relationship with a pet, a child is spurred to experience

caring for another, which engenders a more responsible and empathic attitude, and this supports the child's moral development (Daly & Morton, 2006; Williams et al., 2010). Prosocial behaviors and empathic tendencies generally correlate negatively with aggressive behaviors. Although we are not aware of any studies that have found an association between pet ownership and lower occurrence of conduct disorders in children, some previous studies have found that the inclusion of a dog in the classroom tends to predict a reduction in aggressive behaviors among peers (Hergovich et al., 2002; Tissen et al., 2007). It is possible that interacting with a pet not only regulates emotions but also allows a child to experience a positive interaction that favors behaviors of care, closeness, and sharing, resulting in the internalization of more positive and prosocial relational models and, thus, reducing interpersonal conflicts and aggressive behaviors.

### **Conclusions**

Ultimately, our study contributes to the current literature by suggesting that pet-owning children perceive less security in their relationships with parents, and the latter may be a risk factor for behavioral and relational difficulties. However, pet-owning children reported greater psychological adjustment than non-pet owners, showing higher scores for prosocial behaviors and lower levels of emotional symptoms and conduct disorders. This could mean that although children with pets may feel less secure in their relationships with their parents, pets are a possible protective factor for children's psychological adjustment. It is possible that children tend to prefer the pet as a source of security and this makes them perceive the bond with their parents as less secure, or it may be that some characteristics of the parents or of the family context solicit less perceived security in children with pets than in children without pets. Further studies will be needed to support these hypotheses, and the data presented here must be read in light of the limitations of the study.

In fact, ours was an exploratory study, since previous studies in the Italian context are lacking and, as far as we know, no prior study considered measures of attachment to parents in pet-owning children. We limited the present study to assessing the presence of a pet or more specifically a dog. Future studies may consider child-pet relationship variables, such as pet attachment (Wasner et al., 2019) or pet attitude (Jacobson & Chang, 2018), that may be more significant in predicting child adjustment. In addition, future studies may examine the presence of and relationship with different types of pets, such as cats, rabbits, or rodents, and analyze comparisons. A more detailed collection of sociodemographic data, or data related to family climate or motivations for adopting a pet, or the number of years the pet has been in the home may help us better elucidate the relationships between constructs.

Moreover, the sampling method (convenience sample from a specific social context) does not allow for generalizing the findings to people from

different cultural backgrounds (other cities or countries). Consequently, future research should use more representative samples to facilitate generalizing the results to other social contexts.

Another limitation concerns the reliability of scores pertaining to emotional symptoms ( $\alpha=.57$ ,  $\omega=.59$ ) and conduct problems ( $\alpha=.54$ ,  $\omega=.56$ ) of the SDQ (children's adjustment). These reliability values may be considered acceptable for exploratory research, but they should be taken into account when interpreting the results. Consequently, future studies with larger and representative samples from different backgrounds should replicate this work and examine the differences in attachment to parents and children's adjustment as functions of the presence of a pet at home. More generally, since we used self-reported instruments completed by children in this study, factors such as text comprehension or social desirability may have intervened. Therefore, future research may vary the instruments used to detect the constructs of interest and involve different observers to assess socioemotional outcomes. Finally, the cross-sectional nature of the study precluded us from investigating causal links between constructs. Therefore, future studies may use longitudinal designs.

#### *Ethics statement*

This study was carried out in accordance with the recommendations of Code of Ethics of University of Turin. The protocol was approved by the Ethics Committee for Research, protocol number 47503. In accordance with the Declaration of Helsinki, all parents gave written informed consent for adolescents' participation in the study.

#### *Conflicts of interest*

The authors declare no conflict of interest.

#### *Author contributions*

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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