

# Construction and Validation of a Scale Regarding the Attitudes of Parents of Young Children towards Animals

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## ABSTRACT

This study aims to discuss and analyze the reliability as well as construct validity of the *Attitudes of Young Children Parents Towards Animals Scale* (PATAS) to be used in parents of preschool children. Data were obtained from eight hundred eighty-one parents of preschool children who participated in an educational program regarding pets. The initial model comprised four factors: *Learning for and from animals* (F1), *Cruelty and stereotypes against animals* (F2), *Fears for children* (F3), and *Delinquency* (F4). In the brief version of the scale, the factors proposed were *Learning for and from animals* (F1) and *Cruelty and stereotypes against animals* (F2). The PATAS presented satisfactory validity and reliability, allowing its use in parents. Results are discussed in terms of helping parents to promote positive changes in their approaches towards animals and influencing children to cultivate positive attitudes towards animals at the early stage of their development.

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## 1. INTRODUCTION

Over recent decades, more and more scientists have been concerned with the welfare of pets (Blouin, 2012), and based on research findings, they emphasize the benefits of human coexistence with pets; they are a source of social support (McConnell *et al.*, 2011), contribute to better physical health (Allen, 2003; Headey & Grabka, 2007; Headey, 1995), foster the development of social interactions in society (such as in the case of neighbors; Wood *et al.*, 2005) and offer emotional satisfaction (Sable, 1995). Reviews of the literature on the benefits of the interaction between pets and humans (Barker & Wolen, 2008) and the benefits of dogs to humans and various vulnerable groups in general (Wells, 2007) have been done elsewhere.

Even in critical times such as during the COVID-19 pandemic, not only has the human-animal relationship (Markodimitraki *et al.*, 2022) and the benefits of this coexistence even through touch been explored (Young *et al.*, 2020) but also the quality of life of the pets themselves (Piotti *et al.*, 2021). In addition, the need for changes in perceptions about pets has been highlighted (e.g., Broom, 2005; Wuensch *et al.*, 2002) with consequent key additions

to the relevant legislation and a growing interest in constructing scales to detect individuals' perceptions of pets. The European Union has strengthened the undeniable need for more substantial and effective information and sensitization of different age groups to ensure the right conditions for animal welfare (COM, 2012, as cited in Mazas *et al.*, 2013). The need for the use of scales (as mentioned above) and theoretical background in order to explore the benefits of human-animal interaction has been highlighted by researchers (Dwyer *et al.*, 2006; Wells, 2007). Both qualitative (interviews, observation) and quantitative methods (questionnaires) were used to detect all the positive aspects of the interaction with pets (Meehan *et al.*, 2017).

Many surveys examining adult attitudes towards pets have been conducted through questionnaires or interviews. For example, the study by Alie *et al.* (2007) examines adult perceptions (241) about pet protection, treatment, and adoption, especially dogs. Researchers used information from the World Health Organization (WHO, 1990), and specially trained individuals administered the questionnaire. This study showed that dogs and parrots were the



most popular choice for pet ownership among participants, whereas snakes were the least popular choice. Also, regarding the interaction with these animals, the participants showed a more “passive” participatory interaction, were unaware of the legislation, expressed preferences for animals with specific characteristics, and visited the vet when the pet was ill, which reinforces the view that more information is needed on pets and their well-being.

Few scales explore pupils’ and university students’ perceptions of pets. There are limited scales that assess adults’ attitudes towards pets. In particular, Mazas et al. (2013) constructed a scale to investigate student and university student attitudes about pet welfare. The scale in its initial form was given to 329 subjects aged 11 to 25 years and in its final form to 1,007 subjects aged 12–25 years. The scale in its final version includes 29 statements and has significant internal reliability. In particular, the statistical analyses revealed four factors: animal abuse for pleasure or due to ignorance (e.g., hitting because of frustration), leisure with animals (e.g., circus, animal fights), farm animals (e.g., circumstances of captivity), and animal abandonment. Significant differences were found in perceptions of gender and whether or not to attend university, with women scoring higher rates on pet welfare (Mazas et al., 2013).

In another study, Miura et al. (2000) examined the attitudes of Japanese and English students toward dogs, taking into account the specificities of the two countries. Important topics explored were the positive and negative effects, perceptions about euthanasia, education, cohabitation inside and outside the home, and responsible guardianship. In particular, the sample consisted of 229 Japanese (142 females) and 212 English participants. A questionnaire was used with 57 statements initially and 46 in the final form of the questionnaire, accompanied by questions from other scales, and was enriched with new questions based on existing conditions in England and Japan. The research results yielded 7 factors for the Japanese and 5 for the British, respectively. Significant differences were found between the two sexes in both countries, with women having higher scores in considering dogs as equal members of the family and in accepting the euthanasia factor less easily than men. In addition, Japanese participants seemed to accept euthanasia less easily than English participants.

Some tools have a theoretical background, a very important perspective for measuring perceptions of pets. For example, Meehan et al. (2017) relied on Attachment Theory and Social Support Theory to investigate whether pets constitute sources of support and attachment figures. The study analyzed two studies. One of them was composed of 1,161 students who were pet guardians and completed the Modified Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988), which included questions about whether a pet is a source of support for the guardian but also a scale with 60 statements about pet attachment. This scale, called the Emotional and Supportive Attachment to Companion Animals Scale (ESACA) in its final form, was administered to the subjects of the second research (presented below). It included 31 items and gave four factors related to the attachment to pets:

(a) Proximity maintenance and interaction, (b) Emotional attachment behaviors, (c) Emotional support given and received, and (d) Emotional and monetary value. In addition, this research showed that participants consider pets as a very important source of support, as important as relatives or friends. The other study described in their research (Meehan et al., 2017) investigated whether participants included their pets in their attachment hierarchy and whether they met all relevant functions. The sample of this research was composed of 83 students, whose perceptions were evaluated based on a differentiated version of the Attachment Hierarchy Scale (Hazan & Zeifman, 1994) and the ESACA mentioned above, as well as the Miller Rada Commitment to Companion Animals Scale (MRCPS; Staats et al., 1996). The results showed that pets were included in the hierarchy of pet guardians in important relationships, ranking even higher than siblings.

In their research, Wuensch et al. (2002) attempted to investigate whether there is a relationship between perceptions about animals and their rights and hatred for humans (misanthropy). One research hypothesis was that misanthropy is associated with advocating for animal rights to a greater extent for non-idealists than idealists. The study included 154 college students, mostly women, who completed a questionnaire that included three scales: (1) 10 statements from Forsyth’s Ethics Position Questionnaire (Forsyth & Pope, 1984), (2) 5 statements about misanthropy, and (3) 28 statements about perceptions of animal rights. The results showed, among other things, that a positive relationship exists between not being liked by others and advocating for animal rights, a finding that pertains to non-idealists.

Knight et al. (2004) attempted to explore adult perceptions of the role of animals in society and perceptions concerning the animal mind. In particular, they sought to design a questionnaire that would detect perceptions of those mentioned above and additional factors such as age, gender, place of residence, and so on that influence the formation of these perceptions. The sample consisted of 96 participants (55 women), and the data was collected through a questionnaire focusing on six thematic areas concerning the use of animals and the perception that animals have intellect (use for experiments, for fun, for personal appearance, for financial gain, for workshops for students, for animal management and the existence or non-existence of intellect and emotions). The research results showed—among other things—that the perception of intellect in animals is a predictor for all thematic areas related to the use of animals.

Knobel et al. (2008) constructed a scale to investigate the perceptions of pet guardians (dogs) towards them in Tanzania and the factors associated with shaping these perceptions. The initial scale (in the pilot phase) included 32 statements, and after the appropriate statistical analyses, 12 statements remained. The research sample consisted of 824 dog guardians from 12 regions of Tanzania. Two subscales emerged: one related to the perception of the dog as an equal member (Equality subscale) and the second related to the management/interaction with it (Handling Scale). The results of the present study showed, indeed, among others that the participants

had positive attitudes and that men had more positive perceptions than women concerning dogs being equal members and sustaining interaction with them. Additionally, Muslims had formed more positive perceptions of the “equality” of the pets compared to the Christian participants. Finally, the guardians who had vaccinated their dogs considered them more as equal members of the family.

Another study on the relationship between dogs and their guardians is that of Dwyer et al. (2006), who constructed a relevant scale emphasizing the importance of research aimed at a specific species. The sample consisted of 1125 adults of both sexes who were dog guardians. Three subscales emerged with 28 statements: the subscale that examines the relationship between guardian and dog and their interactions. This subscale examines emotional closeness experienced by the guardian-dog from the guardian’s perspective and (c) the cost that emerges from this relationship for the guardian. The important thing on this scale, among other things, is that it focuses on the negative aspects of this relationship and, therefore, covers more important aspects.

In addition to research focusing on pets or dogs in particular, there is also research focused on cats. For example, Howell et al. (2017) investigated the relationship between cat guardians and cats. In particular, they attempted to build a tool that would explore these relationships. To achieve this, they conducted three surveys. In the first study investigating the interaction between the cat and its guardian, they used the Monash Dog-Owner Relationship Scale (MDORS) by modifying the animal species in a sample of 293 women who were cat guardians aged 18 years old, owned a cat who was one year old or older and lived in the United Kingdom and compared their answers with those of women who were dog guardians. Significant differences were found in the subscale concerning animal-guardian interaction. However, no differences were found in the subscales concerning emotional closeness and the cost of having a pet. In the second survey (which was qualitative), a free-text analysis was performed accompanied by open-ended questions about the relationship between cats and 61 cat guardians to include in the final scale additional important aspects/activities between cats and their guardians (women only). In the third survey, including a sample of 570 guardians, a modified scale was given that included questions from the second survey, as well as questions modified by MDORS. This modified scale was a new tool for measuring perceptions of cats in caregivers.

Barba (1995), in a literature review of studies published from 1988 to 1995, identifies 52 pet-related surveys, noting, among other things, that despite knowledge enhancement in that specific direction, in several cases, the sample was one of convenience. Therefore, there were limitations in terms of methodology. In several cases, psychometric criteria were not used, emphasizing the need for a theoretical framework. Then, Anderson (2007) described 21 tools that investigate the human-animal relationship (but in total, he mentioned 69 in the book), emphasizing that although there were many tools, there was confusion about their reliability and credibility. More specifically, it included scales concerning the relationship of children and adults

with pets and, in particular, attitudes, treatment, attachment, bonding, responsibility, and friendship with animals (Anderson, 2007).

A few years later, Wilson and Netting (2012), drawing on the book of Anderson (2007), identified 140 tools related to human-animal interaction until the publication date of their study. The authors stated:

*“We listed each tool, what it measures (or its stated purpose), information on the structure and properties of the instrument, the source in which it was published, and a citation to another study in which the tool was also used or cited as available.” (Wilson & Netting, 2012, pp. 14).*

The tools included in this review of existing tools were related to various aspects of the human-animal relationship, such as perceptions, attachment, abuse, loss, commitment, experiences with pets, interventions, empathy, fears, animal rights, knowledge about assistant dogs, and demographic characteristics. In addition, the authors emphasized the need for valid and reliable tools for factor analyses and different groups.

From the review of the literature, it became clear that the present project for the construction of a scale that detects the perceptions of parents of preschool children is original, as no scale has been constructed to date-as far as we know-that studies the perceptions of parents and even children of preschool age, since they are the ones who influence the formation of perceptions in their children to a very significant extent (Lightfoot et al., 2005) and therefore by studying their perceptions we can detect what they are and design corresponding information/intervention programs. Consequently, there is a growing interest in the human-animal relationship to know the significant benefits of this relationship, especially the impact that these perceptions can have on children, especially young children who are more malleable and can change entrenched perceptions concerning pets (Lightfoot et al., 2005). In addition, research has focused on perceptions toward pets rather than adults’ perceptions and attitudes regarding stray animals. Our research is filling this research gap, as it also includes perceptions of stray pets. Besides a few exceptional cases, extensive research has focused on the positive view of the coexistence between humans and pets. Nevertheless, the negative views and attitudes towards breeds have not been adequately investigated, which constitutes another important aspect of this study. Finally, it can be used for various pets (e.g., dog/cat) and by parents of children who are or are not guardians of pets.

This study aims to construct and weigh a scale that will detect the perceptions and attitudes of parents of preschool children toward pets. By studying the parents’ attitudes, we will get insights regarding the living conditions of pets, how they behave towards them, and how they perceive their role. This will urge those in charge of intervention programs, including parents and children, to become active guardians of pets and properly informed citizens to behave responsibly towards stray animals.

## 2. METHODOLOGY

### 2.1. Tool Development

The development of the attitudes of young children's parents towards animals scale (PATAS) was comprised of several stages. Actually, the tool was developed in four stages: literature review, selection of variables, pilot study, and evaluation of the psychometric properties. The literature review was the base for the tool development, with the identification of studies regarding perceptions towards animals. The tool was constructed in collaboration with the research team [two academic psychologists, two academics (one specialized in Statistics in Education and one in Science Education at Early Childhood), two educators (one was the president of an Animal Welfare Organization), and one special educator]. Respondents provided the extent of agreement on the items of the scale on a 5-point Likert scale, with 1 representing "totally disagree" and 5 labeling "totally agree." Participants/parents received a hard copy of the questionnaire through the 86 educators who were participating in the project (<http://eyzwwn.edc.uoc.gr>). The instruction of the educators to the parents was that only one parent per student would respond to the questionnaire.

A pilot study was performed with a sample of 466 parents who did not participate in the final study. All were parents of preschool children from public and private preschool classrooms in Greece. Informed written consent was provided by all parents. They answered 19 items regarding demographic data, 53 items regarding their perceptions towards animals, and 5 open-ended questions (regarding the benefits of animal-human interaction and coexistence and other important issues such as their sensitization towards animals). There were phrasal changes in some items, and moreover, some were eliminated. The analysis of the pilot data showed that five factors could be extracted from the initial scale. (*F1: Positive perceptions and interaction with animals, F2: Responsibility towards animals, F3: Delinquency towards animals, F4: Cruelty towards pets, and F5: Stereotypes against animals*).

In the final version, the tool consisted of 18 statements on perceptions of pets, and the questionnaire was distributed on two pages. The first page included demographic data regarding parent and child (e.g., gender, family type, residence, educational level, and disability status of the child), resulting in 13 questions in total and the PATAS scale. The options for answers in the PATAS scale were on a 5-point Likert scale, with 1 representing "totally disagree" and 5 labeling "totally agree". Data was collected in 2018–2019 for the pilot phase and 2019–2020 for the main phase after the approval by the Ethics Committee under protocol No G.A. 544/18.10.2017 and the approval of the Greek Ministry of Education under the protocols  $\Phi 15/212237/53347/\Delta 1$  (pilot phase) and  $\Phi 15/113403/156095/\Delta 1$  (main phase). The study was conducted only in parents whose children participated in schools that agreed to participate in the project regarding pets (<http://eyzwwn.edc.uoc.gr>). Consequently, only parents whose children participated in that educational program and signed an informed consent for their child and themselves were enrolled in the study.

The main phase of the data collection used a total of 881 completed questionnaires. The analyses were performed with SPSS v.24 and R language.

## 3. RESULTS

The sample consisted of 881 parents of preschool age children. 85.3% of them were mothers, 13.1% fathers, and 0.6% were coded as "other". 68% were from urban areas and the remaining from rural. 4% were a single-parent family. Regarding the highest completed educational level of the parents, 3.4% of mothers and 7.0% of fathers have completed only primary education. 8.2% of mothers and 16.5% of fathers have completed the first 3 classes of secondary education. 39.3% of mothers and 43.9% of fathers have completed all 6 classes of secondary education. 39.9% of mothers and 26.4% of fathers hold an undergraduate University degree, and finally 9.2% of mothers and 6.2% of fathers hold a master or PhD degree.

Table I shows the mean and standard deviation (SD) of each item of the scale. An initial exploratory factor analysis (EFA) on all 18 items showed a KMO measure of sampling adequacy equal to 0.730 and  $X^2(136)$  Bartlett's test of sphericity equal to 3132.856,  $p < 0.01$ . The number of eigenvalues greater than 1 suggested a 5 factor model, whereas 4 factors were suggested by the scree plot. Item 3 was a single-item factor, thus it was excluded from the analyses. A 4-factor model (Model 1, see Table I) explained 47.958% of the total variance. All factor loadings were greater than 0.3 on absolute value. On a CFA 4-factor model, even after the inclusion of 6 items' covariance terms in the model, the fit was poor;  $X^2(107) = 383.306$ ,  $p < 0.01$ , the criterion  $X^2/df$  was equal to 3.58 lying between 3 and 5, CFI = 0.913, TLI = 0.889, RMSEA = 0.037 and SRMR = 0.064. Moreover, Cronbach's alpha coefficient for the scale was 0.677. Items on the 4 factors had an alpha equal to 0.772 (7 items), 0.422 (5 items), 0.347 (3 items), and 0.935 (2 items), respectively. The Spearman-Brown and Guttman Split-Half coefficients were also estimated, and they were found close to the Cronbach's alpha coefficients.

Due to the poor fit of the model, additionally with the low Cronbach's alpha coefficients of factor 3 and the low number of items, additionally with their similarity, of factor 4, we estimated a model on the first two factors only. In this model of 11 items, item 5 had a loading less than 0.3 and, therefore, it was excluded from the model. This new model (Model 2, see Table I) explained 41.69% of the total variability. The overall Cronbach's alpha for this new model was increased to 0.707. For this model,  $X^2(37) = 97.670$ ,  $p < 0.01$ ,  $X^2/df = 2.64 < 3$ , CFI = 0.964, TLI = 0.946, RMSEA = 0.045 and SRMR = 0.038, indicating a very good fit of the model on the data, and, thus, we propose the use of the short version/2 factors scale.

The scores of the two factors of Model 2 (through the average of the items after reversing the items that are reverse coded) were calculated. Higher scores of factor 2 indicate a more positive attitude against cruelty and stereotypes. Differences in the mean scores of the two factors between the gender of parents as well as the area of residence (urban/rural) were tested through independent samples t-test. The results are given in Table II.

TABLE I: DESCRIPTIVE STATISTICS OF THE ITEMS AND EFA MODEL FIT (WITH VARIMAX ROTATION)

| Items                                                                                                                  | Model 1 loadings              |                                         |                    |             | Model 2 loadings              |                                         | Mean | SD   |
|------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------|--------------------|-------------|-------------------------------|-----------------------------------------|------|------|
|                                                                                                                        | Learning for and from animals | Cruelty and stereotypes against animals | Fears for children | Delinquency | Learning for and from animals | Cruelty and stereotypes against animals |      |      |
| 1. Having an animal (e.g., a dog or cat) in the house helps a child to realize the power of the animal's faith in man. | 0.758                         |                                         |                    |             | 0.782                         |                                         | 4.08 | 0.86 |
| 2. Animals need to be cared for and their basic needs met.                                                             | 0.605                         |                                         |                    |             | 0.564                         |                                         | 4.67 | 0.59 |
| 6. Animals help the socio-emotional development of children with disabilities.                                         | 0.712                         |                                         |                    |             | 0.731                         |                                         | 4.47 | 0.67 |
| 7. Water and food bowls used on the animals should be clean.                                                           | 0.604                         |                                         |                    |             | 0.528                         |                                         | 4.63 | 0.54 |
| 11. Having a pet at home helps a child learn about companionship.                                                      | 0.771                         |                                         |                    |             | 0.805                         |                                         | 4.28 | 0.79 |
| 12. Cleaning the animal's area is important.                                                                           | 0.532                         |                                         |                    |             | 0.483                         |                                         | 4.74 | 0.48 |
| 16. Informing and raising awareness of children about stray animals is the responsibility of the family.               | 0.483                         |                                         |                    |             | 0.492                         |                                         | 3.97 | 0.80 |
| *4. It is reasonable to poison stray animals since animals interfere in the space that belongs to humans.              |                               | 0.463                                   |                    |             |                               | -0.399                                  | 1.34 | 0.89 |
| 8. Permanent chaining is not a good practice for animals.                                                              |                               | -0.480                                  |                    |             |                               | 0.591                                   | 4.47 | 0.88 |
| *9. The economic crisis is a reason for people to express their aggression against animals.                            |                               | 0.654                                   |                    |             |                               | -0.542                                  | 1.59 | 1.04 |
| *14. We throw the babies of the animals in the trash when we don't want them.                                          |                               | 0.585                                   |                    |             |                               | -0.613                                  | 1.12 | 0.55 |
| *5. Children are at risk when, during their development, they are in contact with stray animals.                       |                               | 0.382                                   |                    |             |                               | -                                       | 3.00 | 1.09 |
| *10. The coexistence of an animal with a child is a big responsibility.                                                |                               |                                         | 0.600              |             |                               |                                         | 4.34 | 0.80 |
| 13. Pets should only be allowed on the streets with their guardian.                                                    |                               |                                         | 0.557              |             |                               |                                         | 4.32 | 0.79 |
| *15. A child should not be forced to grow up with an animal that can be life-threatening (e.g., diseases).             |                               |                                         | 0.594              |             |                               |                                         | 3.69 | 1.14 |
| 17. Electronic marking (microchip) is unnecessary for non-stray dogs.                                                  |                               |                                         |                    | 0.942       |                               |                                         | 2.13 | 1.13 |
| 18. Electronic marking (microchip) is unnecessary for non-stray cats.                                                  |                               |                                         |                    | 0.952       |                               |                                         | 2.16 | 1.11 |
| Cronbach's alpha                                                                                                       | 0.772                         | 0.422                                   | 0.347              | 0.935       | 0.772                         | 0.391                                   |      |      |
| Spearman-Brown                                                                                                         | 0.797                         | 0.453                                   | 0.153              | 0.935       | 0.797                         | 0.418                                   |      |      |
| Guttman Split-Half                                                                                                     | 0.781                         | 0.424                                   | 0.144              | 0.935       | 0.781                         | 0.417                                   |      |      |
| 3. Living animals in barrels or unsuitable accommodation is illegal. (Deleted item)                                    |                               |                                         |                    |             |                               |                                         | 4.51 | 0.99 |

TABLE II: DESCRIPTIVE STATISTICS AND INDEPENDENT SAMPLES T-TESTS OF THE MEAN FACTOR SCORES

|           |        | Learning for and from animals | Cruelty and stereotypes against animals |
|-----------|--------|-------------------------------|-----------------------------------------|
| Mean (SD) | Mother | 4.43 (0.43)                   | 4.63 (0.49)                             |
|           | Father | 4.29 (0.49)                   | 4.50 (0.58)                             |
| t(df)*    |        | 3.05 (824)                    | 2.66 (840)                              |
| p         |        | <0.01                         | <0.01                                   |
| Mean (SD) | Urban  | 4.45 (0.42)                   | 4.66 (0.47)                             |
|           | Rural  | 4.32 (0.50)                   | 4.50 (0.56)                             |
| t(df)**   |        | 3.78 (429.56)                 | 4.03 (448.39)                           |
| p         |        | <0.01                         | <0.01                                   |

Notes: \*Equal variances assumed; \*\*Unequal variances assumed.

All the comparisons between the means-tested showed highly statistically significant differences ( $p < 0.01$ ), indicating that both the gender of parent and area of residence are significant; mothers and residents of urban areas have a more positive attitude (higher mean value) on both factors than fathers and residents of rural areas respectively.

Moreover, we examined through ANOVA if the mother's education level impacts the mean values of the two factors. No difference in the first factor was found ( $F(4, 695) = 0.15, p = 0.961$ ), whereas there were significant differences in the mean values on the second factor ( $F(4, 709) = 4.61, p < 0.01$ ). Through Bonferroni correction, we found significant differences in the mean values of factor 2 between (a) mothers who have completed only three classes of secondary education and mothers who hold a University degree (mean difference  $-0.27, p < 0.01$ ), (b) mothers who have completed only three classes of secondary education and mothers that hold a master/Ph.D. degree (mean difference  $-0.28, p = 0.026$ ). No differences were found in the father's mean values; that may be because mainly mothers chose to complete the questionnaire.

#### 4. DISCUSSION

Regarding the objective of this paper, which is to create a scale of parents' attitudes towards animals and the results of the current study, the PATAS (brief version/2 factors scale) has sufficient evidence of validity and reliability. Several studies in the literature were related to adults' attitudes toward animals in different aspects, but not even one explored the attitudes of parents of preschool children toward animals. One of the main difficulties of performing research in this area is the lack of validated tools to measure this knowledge in different countries and areas, a scale for parents of preschool children to evaluate their perceptions towards animals. The internal consistency of the statements of the scale shows that these items are grouped to measure the same object of the attitude. Concerning the scale's reliability, the results indicate that PATAS is highly reliable.

In other countries, some studies have been related to assessing adults' attitudes and behaviors towards animals, such as those mentioned in the introduction section. The main strategy of our study is to evaluate parents' perceptions to construct school-based interventions aiming at increasing their positive perceptions to positively influence the perceptions of their young children or to differentiate their well-established negative perceptions. The validity of a tool is determined by the load value of each item, representing the relationship the different variables have in order to give a common (general) factor. Literature (Cecchetto & Pellanda, 2014) indicates that regarding tool validation, load values  $\geq 0.3$  are important, and in this study, all the remaining items were higher than this range. An initial analysis of the 18 items provided a five-factor solution, then an item (item 3) was a single-item factor and thus excluded. Hence, a four-factor analysis seemed to represent the structure of PATAS in a Greek sample. Furthermore, due to the low Cronbach's alpha coefficients of factor 3 and the few items of this factor; additionally, with their similarity to factor 4, we estimated and proposed

a model on the first two factors only. In this new model of 11 items, item 5 ("Children are at risk when, during their development, they are in contact with stray animals") was excluded since it did not consistently load with a value of 0.30 in any of the factors.

The initial model, as mentioned, comprised four factors. The names of the four factors were the following: "Learning for and from animals" (F1), "Cruelty and stereotypes against animals" (F2), "Fears for children" (F3), and "Delinquency" (F4). In the brief version of the scale, the factors proposed were "Learning for and from animals" (F1) and "Cruelty and stereotypes against animals" (F2).

Researchers have pointed out different numbers of items ranging from two to five items (Raubenheimer, 2004). A scale specific to measuring attitudes toward parents of preschoolers is necessary for researchers, educators, and policymakers who intend to study animals and their well-being (welfare). Developing a scale for parents to measure attitudes towards animals is challenging, especially after the new law was passed recently in Greece (Government Gazette, 2021) and especially after considering the extent of animal welfare and awareness in many countries worldwide.

In the present study, parents' perceptions and knowledge of the benefits of animals were studied, as well as stereotypes and cruelty against animals, and it was observed that parents expressed more positive views regarding stereotypes and cruelty towards animals (that is, in the second factor there are higher scores). This suggests that there may be more positive (perceptions of) attitudes towards animals and greater and better societal awareness about abusive/cruel behaviors, possibly something that can be achieved through social media. However, the importance of coexistence with animals may not be fully recognized, as well as the benefits that adults and children derive from them and relevant knowledge about animal welfare.

Moreover, mothers had a higher mean score in PATAS than fathers who comprised the sample. This finding probably indicates that mothers are more sensitive towards animals and cruelty towards them and may have had better experiences during their childhood than fathers who adopt a tougher attitude towards animals and even participate in their killing, especially in rural areas. This finding is in line with previous studies that found differences in attitudes between men and women, with women having more positive attitudes towards animals (Furnham et al., 2003; Phillips et al., 2012; Selby & Rhoades, 1981); in fact, studies have shown that women are more attached to their pets compared to men (Meehan et al., 2017), consider pets (dogs) as equal members more than men (Miura et al., 2000), score higher on issues related to animal welfare (Mazas et al., 2013) and spend more time verbally communicating with their dog. Nevertheless, no differences were found in play and affiliative behaviors (Prato-Previde et al., 2006).

One possible explanation for these significant differences between the sexes may be related to the tendency of women to have a more nurturing and caring role as far as gender roles are concerned. However, these may differ depending on the circumstances (Wade & Tavis, 2016). These results contradict the findings of Knobel

*et al.* (2008), which showed that men had more positive perceptions towards dogs than women. Findings are therefore contradictory, while Herzog (2007), in a literature review on the differences between men and women concerning their interaction with animals, emphasizes the contribution of other factors such as age and the species of animals when sex differences are detected. Therefore, training focuses on promoting more positive attitudes in society and educational settings, especially for younger samples, to increase awareness in both sexes, dispel myths, and increase respect towards animals and every living being. To improve parents' attitudes towards animals, several methods can be reported, including specific lectures delivered by academic staff or even volunteers, direct contact with animals in shelters and foster homes, videos to demonstrate the social aspects of the problem (e.g., cruelty, abandonment) as well as educational programs with their children's participation.

The results of the current study show that residents of urban areas have more positive attitudes on both factors: "Learning for and from animals" (F1) and "Cruelty and stereotypes against animals" (F2). Thus, it seems that the parents in urban areas are more sensitized, have developed more positive perceptions about the benefits of animals, are more aware of the needs of animals, and are more negatively predisposed towards abusive behaviors that occur against animals. On the other hand, in rural areas, there are still many abusive behaviors against animals, and they are considered more as "working" animals and "guardians" and less as pets and equal members of the family. In contrast, the use of dogs as guardians with all this act entails has been reported (Anderson, 1990) in low-income urban areas. This suggests that the construction of intervention programs in urban and rural areas with adults is pivotal to raise awareness to adequately produce positive perceptions and attitudes, and thus, reveals a need to promote changes in attitudes towards animals in the long-term by involving preschoolers. Educational courses may also be needed for students to further promote positive behaviors towards animals and their care and support teacher-centered and child-centered interventions to improve attitudes towards animals and maximize their chances for their welfare.

Findings suggest that regarding the educational level, there were significant differences between mothers who have completed only three classes of secondary education and mothers who hold a university degree, as well as mothers who have completed only three classes of secondary education and mothers who hold a Master's/Ph.D. degree only for the factor "Cruelty and stereotypes against animals". In particular, mothers that had a university degree and mothers who hold a Master's/Ph.D. degree have less stereotypical attitudes towards animals and are more aware of acts of cruelty and abuse towards them. This may be because, during their studies, they may have attended some courses, seminars, or training sessions/conferences related to the awareness of "vulnerable groups" or to beings, such as animals, whose prosperity depends solely on the human factor: the responsibility that people take, the enactment or non-enactment of laws in order to protect their rights and the care to meet their basic needs. Regarding the educational level, the research conducted by Mazas *et al.* (2013) showed that university students

scored higher than secondary students on issues related to the exploitation of animals and the free time they spend on animals. In addition, they had a more positive attitude towards farm animals and negative attitudes towards animal abandonment.

The present study focused on validating PATAS in a sample of parents of preschool children. The results showed that PATAS has evidence of a sufficient degree of validity and reliability for assessing the perceptions and attitudes of the parents of preschool children toward animals. Exploring attitudes towards adults who are parents of preschoolers with a scale such as the PATAS is very important as it can provide useful information to the academic staff to help parents promote positive changes in their approaches towards animals and influence children to cultivate positive attitudes towards animals at the early stage of their development. The scale showed satisfactory validity and reliability and was easy to understand, allowing its use in adults. Consequently, as far as implications for education are concerned, these findings can be used in intervention programs to evaluate parents' attitudes and knowledge.

The scale requires additional vetting across participants of varied ethnic backgrounds. Greece is a country with many abusive behaviors towards pets and many cases of violation of the relevant legislation. However, it also has many stray animals in urban and rural areas. In this way, the results could be confirmed and validated with new data.

Administration of the PATAS will help further understand attitudes toward animals by providing researchers and all those involved in education and intervention makers (programs) with a better understanding of the parents' orientation toward animals. The PATAS can be used with programs to increase public knowledge and positive attitudes towards animals. PATAS' results may be useful in monitoring attitudes over time or in response to sensitization campaigns from municipalities. Furthermore, the scale may be useful in an initial public conversation with people who work in public service shelters and volunteers. Furthermore, it becomes especially important at a time when Greece has adopted a new law on animals (Government Gazette, 2021).

The existence of strays, the need for changes, and society's unawareness towards animals and their well-being (welfare) propose a reliable and valid tool for assessing attitudes. Additionally, PATAS can be used for dogs or cats, even by adults who are or are not guardians of animals, and include pets and strays. It could also be administered to parents and re-administered after an intervention program to show if an intervention was effective in raising awareness, cultivating knowledge, eliminating or reducing negative stereotypes, and dealing with animal cruelty. The authors of this paper encourage additional research with PATAS to gain further insight into patterns towards animals.

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