


## Article

# Students' Care for Dogs, Environmental Attitudes, and Behaviour

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**Abstract:** Does the act of caring for a dog have a substantial connection to the environmental values and behaviours of children? The scientific current literature contains little empirical research regarding the effect of pet ownership on environmental attitudes and behaviours in children. The Two Factor Model of Environmental Values (2-MEV) scale and the General Ecological Behaviour (GEB) scale were applied to measure environmental attitudes/values and ecological behaviours aligned with the Children's Care for Dogs Questionnaire (CTDQ) to measure individual care for dogs. The subjects were Slovenian adolescents in primary education and lower secondary education. A clear relationship emerged: students that reported a better level of care for their pet dogs tended to engage in more environmentally responsible behaviours. Preservation and utilization attitudes had no significant influence on caring for a dog. Female students tended to report better care for dogs and practiced environmental behaviour more often. Younger students scored higher on the preservation values and practiced environmental behaviour more often. Overall, this study provides an evidence-based framework for educational initiatives that aim to include long-term care for animals. This study proposes a method with which educational programs could achieve the goal of fostering environmental behaviours.

**Keywords:** caring for dogs; environmental values; environmental behaviours; students; 2-MEV scale

## 1. Introduction

Effective change in human behaviour is needed because of the many human activities that have negative impacts on the environment, such as the increasing degradation and fragmentation of habitats, the spread of invasive species, pollution, overexploitation of natural resources, and climate change [1]. Human survival is directly linked to our relationship with the environment and so, it is essential to establish a sustainable lifestyle based on a balance between individual consumption and the capacity of the natural environment to renew itself [2].

To confront this enormous task, cognitive, social, and motivational processes are needed to influence individual behaviour [3–5]. Several factors influencing environmental attitudes and behaviour are already well described and have positive or negative power to shape them [6–8]. The importance of measuring environmental attitudes lies in the expectation of obtaining a valuable predictor of environmental behaviour. Environmental attitudes are described as a collection of beliefs and perceptions regarding nature [9,10]. Milfont and Duckitt [11] described environmental attitudes as a psychological tendency that expresses itself as an inclination toward—or concepts related to—the environment. Empirical researchers regard environmental attitudes as unidimensional or multidimensional constructs [12,13], and a value is defined as a series of closely related attitudes [14].

Although earlier studies described the relationship between attitudes and behaviours as weak or even negligible [4,15], more recent studies have pointed to their substantial determinant role [16] so environmental attitude sets may somewhat predict—but not exclusively determine—environmental behaviour. This so-called attitude–behaviour gap is also influenced by many (other) variables, such as age, gender, education, political orientation, knowledge, belief, place of residence, and social class [17–22].

It has been well documented that environmental attitudes in adulthood are significantly influenced by contact with nature and animals during childhood [23,24]. Experiencing nature is positively correlated with environmentally conscious behaviour in everyday situations with low task complexity [25]. Previous research has shown that animal and place attachment can predict pro-environmental behaviour among adults [26–28] and adolescents [29,30]. However, the question remains about a potential relationship between the intensity of interactions with pets (in this case dogs) and environmentally sound practices.

### 1.1. Children and Pets

The most common children’s pets are dogs and cats [31]. Children show strong attachments to pets and many consider pets their best friends [3,32,33]. Pets make children happy, reduce their loneliness, help to calm them [32] and increase their self-confidence [34]. Relationships between children and pets can be especially crucial for children lacking a stable or secure bond with their caregivers [35]. It is known that pet ownership correlates with certain positive physiological measures, such as lower blood pressure, serum triglycerides, and cholesterol levels [33]. Pet ownership has a positive influence on oxytocin release (the body’s “feel-good chemical”) and individuals’ social bonds [36].

Research has shown that children who care for pets themselves feel more connected to them than children that share the responsibility for a pet with other family members [32]. Muldoon, Williams, and Currie [37] studied types of attachment to pets in groups of eleven-, thirteen-, and fifteen-year-olds. They found a pattern of decreasing attachment to pets with age. Similarly, Vidović, Štetić, and Bratko [38] found that the strength of children’s attachment to their pets gradually decreases with age.

Children are particularly attached to dogs and they see dogs as friends [31,39]. Children and adolescents who own dogs are more independent because caring for a dog encourages responsibility and self-sufficiency [40]. Children’s attachment to their dog is likely to be stronger if they are involved in caring for the dog and understand its needs [41]. For adolescents, dogs can provide reliable emotional support [40]. Cassels, White, Gee, and Huges [42] asked parents that have a family dog about their children’s care for the dog. They determined the extent to which children feed, walk, teach, groom, and clean their dogs. They noticed that children usually do not pay much attention to the dog. This was probably because—most of the time—all the family members own the dog [31] so children do not feel fully responsible for caring for the dog themselves.

### 1.2. Pet Ownership, Environmental Attitudes, and Behaviours

Paul and Serpell [43] found that adults that had pets in their childhood showed more positive attitudes towards animals in general, pets, laboratory animals, and wildlife. They were also more concerned about environmental problems and were more likely to be members of animal welfare/environmental organizations. Similarly, Bjerke et al. [44] found that children without pets like farm animals and wild animals less than pet owners. Close contact with—and ownership of—pets improve attitudes towards animals in general [45] and thus, pets can be perceived as ambassadors for other animals [46]. Bowd [47], for example, showed that children with pets had fewer negative attitudes toward other animals, such as lions, pigs, chickens, and snakes. Pagani et al. [48] reported that owning a pet is associated with greater empathy for animals used in the fur and leather industry and for zoo animals. Binngießer et al. [49] reported that the ownership of pets leads to a higher appreciation of animals and less approval of hunting. Binngießer and Randler [50] found no significant correlation between pet ownership and schoolchildren’s attitudes toward the preservation and utilization of nature.

### 1.3. Research Goal and Questions

This study examined whether there is a connection between students' care for their dogs and their environmental attitudes and behaviour. The study also sought to investigate gender and age-related differences in environmental attitudes, self-reported pro-environmental behaviours, and level of dog care. To the best of our knowledge, no studies have fully explored these relationships in children. Therefore, the main goals were to 1) reliably and validly measure care for a dog, 2) measure environmental attitudes/values and behaviours in an adolescent sample, and 3) to analyse relationships between children's intensity of interaction with dogs, environmental attitudes, and behaviours based on linear structural modes.

## 2. Materials and Methods

### 2.1. Sample

The study involved 480 students from four nine-year public schools in south-eastern Slovenia. In Slovenia, the nine-year compulsory school is divided into three three-year cycles (for students six to fifteen years old). Ninety-nine percent of such schools are public and state-financed. The first six years cover primary education (ISCED 1). Grades seven to nine are internationally classified as lower secondary grades (ISCED 2). This is followed by a secondary education system (lasting two to five years; Eurydice, 2019). There were more girls (51%) than boys (49%) in the sample. Students ten to fifteen years old ( $M = 12.16$ ,  $SD = 1.48$ ) participated in the research. Data on pet ownership and dog ownership are presented in Tables 1 and 2.

**Table 1.** Descriptive statistics on pet ownership.

Owner of a Pet	<i>f</i>	<i>f</i> (%)	Most Common Pets	<i>f</i>	<i>f</i> (%)
Yes	380	79.2	Dog	285	75.0
			Cat	195	51.3
			Rabbit	47	12.3
			Fish	29	7.6
			Parrot	17	4.5
			Horse	13	3.4
			Other	>11	>2.9
No	100	20.8			

**Table 2.** Descriptive statistics on dog ownership.

Dog Ownership		Owners		Non-Owners		Total	
		<i>f</i>	<i>f</i> (%)	<i>f</i>	<i>f</i> (%)	<i>f</i>	<i>f</i> (%)
Grade	5	66	62.26	40	37.74	106	22.08
	6	72	63.16	42	36.84	114	23.75
	7	41	48.81	43	51.19	84	17.5
	8	47	55.95	37	44.05	84	17.5
	9	59	64.13	33	35.87	92	19.17
Gender	Female	158	64.5	87	35.51	245	51.04
	Male	127	54.04	108	45.96	235	48.96

### 2.2. Procedure

Participation in the survey was anonymous and voluntary. Before the survey began, the principals of the selected schools were contacted to obtain consent to carry out the study. The participants from the schools provided prior informed consent to participate in the research. The data were collected during regular science lessons or class meeting hours. Before the students began completing the questionnaires, the researcher gave them detailed instructions. All the students completed the first

two parts of the questionnaire, which included demographic questions, the Two Factor Model of Environmental Values (2-MEV) scale, and the General Ecological Behaviour (GEB) scale. The third and final part of the questionnaire was only completed by students who had a dog at home.

### 2.3. Instruments

The Children's Care for Dogs Questionnaire (CCDQ) assesses children's level of care for dogs with eleven items. Examining the content of the Children's Treatment of Animals Questionnaire [51] was central to the development of the CCDQ. The wording of the questionnaire was adjusted to refer only to dogs and some new items were added. The responses used a five-point Likert scale (1 = never, 2 = sometimes, 3 = regularly, 4 = usually, 5 = always).

The Two Factor Model of Environmental Values (2-MEV) [12,25] was applied to measure environmental attitude sets by focusing on higher-order factors (values): utilization and preservation of nature. Preservation represents a biocentric view of nature and utilization represents an anthropocentric preference [34]. The factors of nature utilization and preservation are independent of each other [25,52,53]. The questionnaire contains twenty statements that the students rated using a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree). Ten statements measure attitudes towards the utilization of nature, and ten statements refer to the preservation of nature. We decided on the 2-MEV for two reasons. Firstly, this scale has been repeatedly confirmed by independent research groups (e.g., [11,54]). Secondly, the model allows for an individual to vote for a biocentric and anthropocentric view, at the same time, rather than placing an individual on a continuum between both [13].

Ten items from the General Ecological Behaviour (GEB) scale [5,55] were used (e.g., "I collect and recycle used paper", "I take empty bottles to a recycling bin", "I prefer to shower rather than to take a bath", "I have pointed out unecological behaviour to someone"). Items with GEB that students in primary and lower secondary school could perform were selected, i.e., behaviour in the household and nature protection activities. The items were answered on a five-point Likert scale (1 = never, 2 = seldom, 3 = sometimes, 4 = often, and 5 = always). For all items, "I do not know" was a response option if an answer was not possible and such responses were treated in the further analysis and calculations as missing values.

### 2.4. Statistical Analysis

The twenty items of the 2-MEV scale and the CCDQ were subjected to a principal component analysis (PCA) using the Statistical Package for the Social Sciences (SPSS). Before the PCA was performed, the suitability of the data for factor analysis was examined with the Kaiser–Meyer–Olkin value [56,57] and Bartlett's test of sphericity [58]. Basic descriptive statistics ( $M$ ,  $SD$ ) were used for the 2-MEV factor utilization (UTL) and preservation (PRE), GEB as well as CCDQ. Structural equation modeling software (AMOS) was used for confirmatory factor analysis (CFA). By analysing a path analysis, the relationships between the variables considered in this research were investigated. Four indices were used to assess the fit of the model, including the  $\chi^2/df$  ratio, normed fit index (NFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). These are standard indices for CFA that indicate the degree of fit of the model.

## 3. Results

For the CCDQ, a factor with eleven items was extracted, explaining 41.2% of the variance (Table 3). The Kaiser–Meyer–Olkin value achieved 0.88, exceeding the recommended value of 0.60 [56,57]. Bartlett's test of sphericity [58] achieved statistical significance ( $\chi^2 = 911,178$ ,  $df = 55$ ,  $p < 0.001$ ) and supported the factorization of the correlation matrix. Cronbach's alpha scored 0.87. The overall mean and standard deviation for dog care was calculated ( $M = 3.58$ ,  $SD = 0.742$ ).

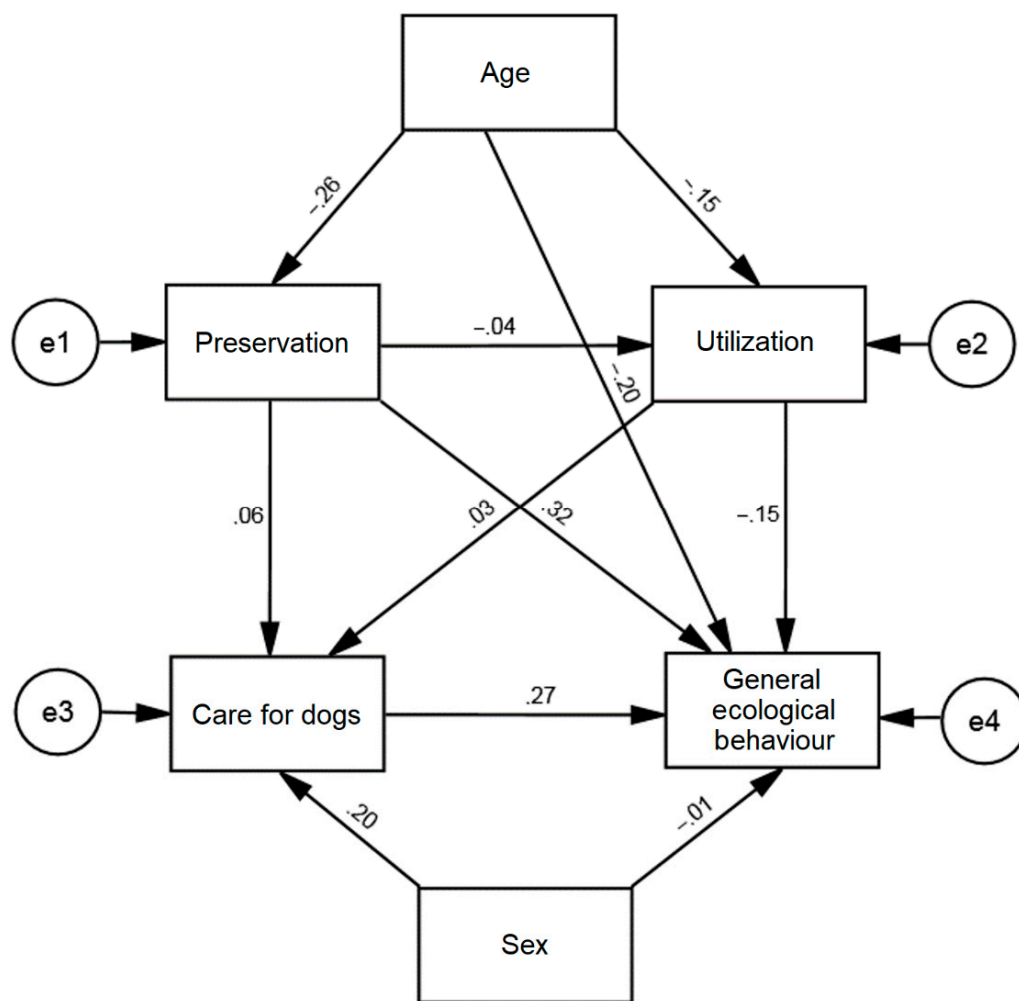
**Table 3.** Factor structure of the Children’s Care for Dogs Questionnaire (CCDQ).

Item	Factor
8. Talk to, encourage, and praise the dog.	0.809
3. Play with the dog.	0.704
10. Clean up the dog’s bed/house.	0.694
9. Give water to the dog.	0.629
1. Take the dog for a walk.	0.604
4. Prepare food for the dog.	0.689
5. Wash the dog.	0.645
2. Comb the dog.	0.625
7. Pick up the dog’s droppings.	0.574
11. Clip the dog’s claws.	0.572
6. Let my parents take care of the dog. *	0.453

Note: \* item 6 was reversed to calculate the average score.

The original two-factor structure of the 2-MEV scale [25,52] was approved. The Kaiser–Meyer–Olkin value of 0.793 exceeds the recommended value of 0.60 [56,57] and Bartlett’s test of sphericity [58] achieved statistical significance ( $\chi^2 = 2146.061$ ,  $df = 66$ ,  $p < 0.001$ ) and supported the factorization of the correlation matrix. Two items (i.e., “Weeds are as important as beautiful flowers” and “I always switch off the light when I do not need it”) were dropped from the analysis due to cross-loading. For further analysis, mean scores for the 2-MEV scale were computed: preservation (PRE) ( $M = 3.86$ ,  $SD = 0.495$ ) and utilization (UTL) ( $M = 2.51$ ,  $SD = 0.485$ ). The internal consistency of the GEB scale with ten items was low and Cronbach’s alpha = 0.60. The mean values of the GEB were calculated ( $M = 3.33$ ,  $SD = 0.514$ ).

The fit measures of the model (Figure 1) in this study indicated a very good model fit: Chi2/df ratio = 1.81, normed fit index (NFI) = 0.99, comparative fit index (CFI) = 1.00, root mean square error of approximation (RMSEA) = 0.00. We concentrated on correlations rather than regression or covariance measures. The majority of the theoretically expected paths in the structural model proved to be significant, with the following exceptions: attitudes toward nature preservation turned out to be a non-significant determinant of attitudes toward the utilization of nature ( $\beta = -0.04$ ,  $p = 0.341$ ). Gender had no significant influence on environmental behaviours ( $\beta = 0.05$ ,  $p = 0.263$ ), and preservation ( $\beta = 0.06$ ,  $p = 0.291$ ). Utilization ( $\beta = 0.03$ ,  $p = 0.239$ ) attitudes had no significant influence on care for a dog, as the standardized multiple regression weights show. The strongest positive effects in the model were found between the attitudes toward the preservation of nature and general environmental behaviours ( $\beta = 0.32$ ,  $p < 0.001$ ), and between caring for a dog and environmental behaviour ( $\beta = 0.27$ ,  $p < 0.001$ ). Age showed negative influence on the preservation attitudes ( $\beta = -0.26$ ,  $p < 0.001$ ), utilization attitudes ( $\beta = -0.15$ ,  $p < 0.001$ ), and environmental behaviours ( $\beta = -0.20$ ,  $p < 0.001$ ). Older children had attitudes and behaviours that are less pro-preservation. Utilization attitudes had a negative effect on environmental behaviours ( $\beta = -0.14$ ,  $p < 0.001$ ). Moreover, girls showed more care for dogs than boys ( $\beta = 0.19$ ,  $p < 0.001$ ).



**Figure 1.** The model represents observable variables (in rectangles), and numerical values are standardized multiple regression coefficients ( $\beta$ -weights). Analyses are based on factor scores extracted by the Statistical Package for the Social Sciences (SPSS).

#### 4. Discussion

One of the central challenges in education regarding sustainable development is the investigation of factors that promote or prevent environmentally friendly behaviour in students. Attitudes toward nature have proven to be a determinant of environmental behaviour [2]. This was also the case in this study, in which preservation attitude sets turned out to be the most important factor in the general environmental behaviours of Slovenian students. Much research has examined and emphasized the importance of children's attitudes towards animals in acquiring environmental attitudes [23,24] but very little is known about how care for dogs correlates with their environmental behaviour.

Dogs are considered to be one of the most enjoyable animals [59]. For modern dog owners, dogs are like children, and their behaviour towards their dogs can be considered parental behaviour toward members of another species [39]. Previous research has shown that close contact and ownership of pets can improve attitudes toward animals in general [44,45,48]. However, the effects of pet ownership are difficult to interpret for young people as their daily responsibilities regarding pets tend to vary. This is especially the case with dogs because families usually own dogs collectively and they are treated as family members, consequently, care for dogs is often divided among all family members. In this study, an attempt was made to investigate the relationship between the degree of care for the dog (e.g., playing with the dog and cleaning the dog's bed) and the frequency of children performing environmental behaviour. The results confirm a significant positive relationship between the two variables. Children



that were more actively involved in the daily care for their dogs also practiced more environmental behaviour. The link between pet ownership and attitudes toward nature preservation may arise from two directions: more environmentally responsible people may choose a pet as a companion more often, or having a pet as a companion might lead to pro-environmental behaviour [50].

Concerning the age of students, in this study, younger students had more pronounced attitudes toward nature preservation and they were more likely to practice environmental behaviours than older students, which is in line with the literature, as other researchers have also shown that younger students tend to have more positive environmental attitudes [50,60] and behaviours [61] than older students. It is worrying that older students care less about the environment than younger students. This is a challenge that educational programs and policies must face. One possible explanation is that young people do not receive adequate incentives and examples in their environment. As they grow older, they become increasingly aware of what is happening in their surroundings and begin to understand that environmental protection is not as valued in society as they thought in their early childhood.

Gender differences in dog care reflect the results of previous empirical research [37] in which female students were found to be more attached to pets than males. According to some researchers, modern human attachment behaviour, affection, and caregiving are more developed and stronger in women than in men, and maternal characteristics have been extended from babies to family dogs [39]. Anthropological studies support this view and have shown that in the past, in many cultures, domestic animals were even breastfed by women, and it is believed that this played a significant role in the domestication process [62].

Surprisingly, the gender of students had no significant influence on their environmental behaviour. According to findings from previous research [63,64], female students tend to be more sensitive to environmental issues and more willing to engage in pro-environmental activities than male students. Gender is not in itself a precise determinant of pro-environmental behaviour but it is certainly not negligible in a social context and in relation to psychological factors such as motivations, attitudes, perceived consumer effectiveness, and environmental knowledge. Therefore, it could be valuable to investigate this in detail in further research and implement the findings in educational practice. In follow-up research, we plan to use an adapted self-efficacy instrument developed by Avsec and Szewczyk-Zakrzewska [65] to investigate how self-efficacy and environmental attitudes of male and female students can predict their environmental behaviour.

#### *Limitations of the Study*

The research on this issue inevitably has some limitations. Firstly, the research was only completed in a few schools. Sometimes, principals of schools are unwilling or unable to consent to research in their schools, which could lead to selection bias. However, in this study, all the principals from the invited schools approved the research. Secondly, we attempted to create a fairly comprehensive list of general environmental behaviour and dog care actions that could be beyond the control of some of the students. Students' actions may be substantially influenced by parental decisions or instructions. Moreover, the GEB instrument had a low Cronbach's alpha (0.60) but this was expected due to the many specific factors that prevent people from regularly engaging in environmental behaviour. As discussed in Kaiser [66] and elsewhere, measurements of specific ecological behaviour are problematic as specific behaviours are susceptible to a wide range of influences and people seem to be inconsistent in their environmental behaviours; therefore, we used more general behaviours from the GEB scale. For further research, however, it could be interesting to collect data on real environmental behaviours (e.g., saving electricity or water) and dog care through practical observations.

#### **5. Conclusions**

The more students report caring for their dogs, the better they are at practicing environmental behaviours. This clear relationship provides a beneficial framework for the development of educational programs and their adjustment to specific target groups. It also provides additional guidance on how

to best intervene in the environmental value system and promote education to meet the demands of a sustainable future. The present study not only provides new important data for closing the attitude–behaviour gap, but it also illuminated new paths for the development of education for sustainable development, suggesting that students should have take on more personal responsibility for everyday tasks that they can handle. Formal and informal educational programs could help students develop their responsibility towards other living beings by providing them with age-appropriate activities that involve taking care of animals and plants, e.g., farm animals, garden plants, and pets. These should be long-term activities whereby students can feel personal responsibility for the wellbeing of nonhuman entities. This would grant them a deeper appreciation for and understanding of the living conditions of various organisms and in the long-term, lead to them developing environmental values/attitudes and behaviour. The understanding of these issues would be enhanced by further research involving in-depth interviews to allow respondents to explain or elaborate on their responses. In terms of ensuring the effectiveness of environmental education, it is important to note that younger students had higher values on preservation and practiced environmental behaviour more often than older students. Nevertheless, it is important to recognize that such findings should not simply be generalized but should be further examined and discussed from different standpoints (e.g., time and place). The challenges that environmental problems pose for education, political decisions, and individual choices serve as a reminder of the importance of ongoing and comparable research (i.e., with established and verified instruments for measuring environmental values, attitudes, behaviour, etc.) worldwide.

**Author Contributions:** T.F. collected the data and provided the data curation. G.T. created the first draft of the manuscript and made further improvements. F.X.B. improved and commented on the manuscript. All authors have read and agreed to the published version of the manuscript.

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