

## ECOLOGICAL AWARENESS AND CHILDREN'S ENVIRONMENTAL EXPERIENCE

José A. Corraliza<sup>1</sup> and Silvia Collado<sup>2</sup>

<sup>1</sup>Universidad Autónoma de Madrid. <sup>2</sup>Universidad de Zaragoza

Hasta fechas muy recientes, el estudio de las creencias y actitudes ambientales se ha centrado en muestras de participantes adultos. Sin embargo, conocer el nivel de conciencia ambiental infantil es relevante, ya que facilitará que las generaciones futuras asuman las exigencias de la proambientalidad. Este trabajo se destaca la importancia de las experiencias ambientales en la infancia para asumir valores y creencias proambientales. Se ofrecen datos sobre el nivel de conciencia ecológica de muestras infantiles en España utilizando tanto la Escala del Nuevo Paradigma Ambiental (NEP) como la Escala de Percepción de Problemas Ambientales (CEPS). Los datos registrados permiten concluir que el nivel de conciencia ecológica de la población infantil española es medio-alto. Además, se propone un modelo en el que se definen cuatro perfiles ecológicos en la infancia: Eco-orientados, naturalistas de salón, utilitaristas y tecno-orientados. Se concluye destacando el valor de las experiencias de contacto con la naturaleza.

**Palabras clave:** Infancia, Naturaleza, Orientación ecológica.

Until recently, the study of environmental beliefs and attitudes has been focused on adults. However, a better understanding of children's environmental awareness is needed, since this will make it easier for future generations to assume the demands of pro-environmentalism. This paper highlights the importance of environmental experiences during childhood for the development of pro-environmental attitudes. We discuss different data about Spanish children's ecological awareness, measured with the New Environmental Paradigm (NEP) scale and the Children's Environmental Perception Scale (CEPS). According to our findings, Spanish children show a medium-high level of ecological awareness. In addition, we propose a model describing four ecological profiles: eco-oriented, lounge ecologists, utilitarians, and techno-oriented. We conclude by highlighting the value of experiences of contact with nature for children's pro-environmentalism.

**Key words:** Childhood, Nature, Ecological awareness.

One of the biggest global challenges today is to face up to the serious environmental problems that threaten the present and the future of life on Earth (Evans, 2019). The very term "environmental problems" encompasses a broad category of symptoms of alterations but hides the fact that these symptoms are not the product of the autonomous dynamics of nature (Cook et al., 2013). More than forty years ago, Maloney and Ward (1973, p.583) advocated for the intervention of the psychologist in the face of environmental problems, arguing that, in effect, the ecological crisis can be described as a consequence of "inadequate adaptive behaviors". Subsequently, Stern (2000, p.524), collecting data from studies conducted since the 1970s, concludes that 47.2% of the emissions that affect climate change are related to decisions that people adopt in their daily life (residential energy expenditure, consumption, transport, etc.). Therefore, it can be said that environmental problems have their origin in our ways of life, social organization, and human behavior, and they do not arise

as a result of mere cyclical evolutions of nature. Environmental problems in general, and climate change in particular, are a good example of the maxim, long advocated by environmental psychology, according to which there is no purely technical solution to the current ecological crisis, and intervention strategies to deal with environmental challenges need to promote changes in personal and collective ecological attitudes and behaviors (Huertas & Corraliza, 2017). This explains the interest of the study of the processes of development of and change in ecological awareness including beliefs, attitudes, intentions, and effective behaviors. In this sense, the development of ecological awareness in childhood takes on a crucial importance, taking into account the importance that the things that children learn have in people's future actions (Evans, Otto, & Kaiser, 2018). This article gives a brief tour of the latest research on child pro-environmentalism, emphasizing the findings with Spanish samples.

### **Ecological awareness in children**

The study of the origin and processes of the development of environmental attitudes and environmental behavior of children is extremely relevant (Hahn & Garrett, 2017). Several authors have highlighted the importance of children's environmental experience in the formation of environmental attitudes and

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Correspondence: José A. Corraliza. Departamento de Psicología Social y Metodología. Facultad de Psicología. Universidad Autónoma de Madrid. 28049 Madrid. España.

Email: [josea.corraliza@uam.es](mailto:josea.corraliza@uam.es)



lifestyle in adulthood (Chawla & Derr, 2012; Evans et al., 2018; Hinds & Sparks, 2009). Sometimes, it is thought that ecological awareness is based primarily on the knowledge and information that the person has about environmental problems and the dynamics of nature. For this reason, both intervention strategies for environmental problems and environmental education programs to promote greater ecological awareness have been based, fundamentally, on the dissemination of information on environmental issues (Rickinson, 2001). These strategies have focused on disseminating information and designing resources to promote greater environmental knowledge of the population in order to increase pro-environmental attitudes and environmentally responsible behavior. In this sense, it has been confirmed that the level of knowledge of people does indeed influence whether they adopt pro-environmental behaviors or not (Duerden, & Witt, 2010). However, it must be borne in mind that the adoption of pro-environmental behavior patterns is a process influenced by a large number of variables (attitudes, opportunities for action, habits, previous experiences, role models, etc.). The level of environmental knowledge is just one of many variables (and it is not clear that it is the most relevant) in the process of forming ecological awareness and the adoption of pro-environmental behavior patterns and lifestyles. One of the factors that plays an important role in the formation of ecological awareness is environmental experience during childhood through direct or vicarious contact with nature.

**Significant environmental experiences**

One of the lines of work in the study of the process of developing ecological awareness has focused on analyzing samples of people who, in their adult stage, participate actively in the defense and protection of the environment (Chawla & Derr, 2012). It involves asking these participants to report on the experiences that have influenced them to become involved in pro-environmental activities. In the field of environmental education, this type of work is framed in the analysis of what Chawla (1999) calls “significant life experiences”.

Following the compilation of this type of work carried out in a previous contribution (Collado & Corraliza, 2016), the value of early experiences of direct or vicarious contact with the natural environment is highlighted in the development of ecological awareness. Thus, for example, Chawla (1999) studied a sample of 56 people who in the adult stage devote a large part of their time to protecting the environment. According to the data obtained in this retrospective study, there are two reasons that participants cite most frequently. Firstly, the memory of positive experiences of stays in natural or naturalized spaces during childhood, and, secondly, the memory of the influence of people who acted as inducers of the value of environmental commitment (especially family members or teachers). Along with these early experiences, other reasons are added such as being part of free time in nature groups or learning about environmental matters through formal education. Likewise, Palmer, Suggate, Robottom, and Hart (1999) analyzed the retrospective valuation of the early environmental experiences of

a sample of adults. In this case, the participants were also asked about the reasons that, according to them, led them to adopt pro-environmental commitments. Once again, the value of children’s experiences of staying in and having direct contact with natural environments is confirmed, as well as the vivid memory of natural places or living beings that inhabit them (an animal or a tree, for example). In line with the results of Chawla and Derr (2012), the study participants noted additional reasons linked to their training process or professional experience, as well as to people in their immediate environment (friends, relatives, teachers).

Other studies have compared the childhood experiences of people with different profiles of ecological awareness (especially those linked and not linked to environmental defense) in samples of the general population. For example, Wells and Lekies (2006) collected data from a sample of 2,004 adults on their current environmental beliefs and behaviors, on their past experiences of contact with nature, and their memory of having participated (or not) in environmental education programs before the age of 11. This study concludes that there is a relationship between the adoption of patterns of pro-environmental attitudes in adulthood and the memory of having frequent childhood experiences of activities related to nature, including recreational activities in natural environments, camping and hiking. However, there is no significant correlation between having participated in environmental education programs and subsequent environmental attitudes. The analyses presented in this work allow us to confirm that environmental attitudes in adulthood have a mediating effect on the relationship between childhood experiences with nature and adult pro-environmental behavior, including behaviors such as frequent recycling or voting for parties for the defense of the environment, among others.

Similarly, Ewert, Place, and Sibthorp (2005) examined whether there is a relationship between outdoor recreational activities at an early age and the later environmental beliefs of these children as adults. For this, these authors used the New Ecological Paradigm Scale (NEP) by Dunlap, van Liere, Mertig, and Jones (2000), which allowed them to classify a sample of 576 students into two groups of people with ecocentric and anthropocentric beliefs. Along with this variable, the frequency of realization of recreational activities in nature was recorded, which could be of three types: (1) Appreciation activities, such as bird watching or enjoying the landscape. These types of activities have little impact on the environment. (2) Mechanized activities, which involve the use of technological devices in nature, such as off-road vehicles, and (3) consumer recreational activities, in which something is taken out of the environment (for example, fishing or hunting). As well as these, participation in formal environmental education was also recorded, negative experiences in nature such as seeing the destruction of a nearby natural area due to development, and participation in organizations that do outdoor activities (e.g., boy scouts). The results showed that positive experiences of nature observation significantly predict ecocentric beliefs, while participation in



other activities of extraction or use of natural resources is related to anthropocentric beliefs. In addition, it was found that the development of ecological awareness in the adult stage is affected by the influence of social actors that are part of the child's daily life (parents, teachers, peer group members, etc.). But aspects related to one's own personal environmental experience are also relevant, with the influence of frequent contact with nature being underscored. As these authors indicate, "direct play in the natural environment induces the development of a more pro-environmental vision" (Ewert et al., 2005, p. 2. 3. 4). Consistent with these results, Thompson, Aspinnall, and Montarzino (2008) highlight the childhood factor to refer to the significance that children's experiences of contact with nature have in shaping ecological awareness in adulthood. Likewise, other contributions such as that made by Cheng and Monroe (2012), based on a study of 9- and 10-year-old children, show that experiences in nature predict a greater interest in participating in other activities in natural environments, as well as a greater intention to adopt pro-environmental behaviors. Finally, mention should be made of the study conducted by Roczen, Duvier, Bogner, and Kaiser (2012) with a sample of primary school children in Bavaria (Germany), which confirms that having rewarding experiences of contact with nature is a powerful mediator in the creation of pro-environmental attitudes.

Taken together, these studies show, despite the biases derived from the fact that many of them are based on the retrospective recall of past experiences, the prevalent influence of environmental experience in childhood (in particular, contact with nature) in the formation of pro-environmental and eco-centric attitudes, beyond the influence that other resources and strategies based on increasing knowledge or campaigns to promote environmental ideas may have. These results have recently been supported by the findings of Evans et al. (2018) in a longitudinal study. The researchers collected data on, among other variables, children's ecological awareness, pro-environmental behavior, and direct contact with the natural environment in 6-year-old children. The same data were collected every two years until the participants turned 18. The results show that the strongest predictor of pro-ecological behavior at age 18 is environmental experiences in nature at the age of 6 years.

#### ECOLOGICAL AWARENESS. EVIDENCE IN SPANISH CHILDREN'S SAMPLES

The works mentioned above confirm that the type of significant experiences that people have in their childhood plays an important role in the process of forming ecological awareness. But, as has been emphasized above, this is not the only influencing factor. In addition, we must take into account cultural influences and evolution through the different stages of life, among other variables. In this sense, the question arises of what the ecological profile of children in Spain is. In recent years, various studies have been conducted to assess the level of ecological awareness of children, as well as the factors that

influence the development of this awareness (Collado & Corraliza, 2015; Corraliza, Collado, & Bethelmy, 2013). For this purpose, two scales adapted for use in Spanish samples have been used. The first one is the New Ecological Paradigm scale (NEP, Dunlap et al., 2000). The NEP is a well-known instrument used in environmental psychology to measure the environmental beliefs of the adult population. This scale has been adapted for use in children's samples by Manoli, Johnson, and Dunlap (2007), and an adaptation is available for use with Spanish children's samples (Corraliza et al., 2013). The second instrument that has been used is the Children's Environmental Perceptions Scale (CEPS; Larson, Green, & Castleberry, 2011). According to the authors of the scale, its structure has two factors called eco-affinity and eco-awareness. Larson et al. (2011) define eco-affinity as a personal interest in nature and intentions to carry out pro-ecological behaviors, and eco-awareness as beliefs based on the knowledge that children have about environmental problems. In the analyses carried out with Spanish samples, the structure of both scales was found to be one-dimensional. Thus, the NEP scale in its Spanish version allows us to evaluate the level of ecocentrism in the sample and the CEPS enables us to obtain data on what the authors of the adaptation have called the "ecologist orientation". This includes items that refer to the need to learn and be in contact with nature, as well as the expression of a disposition favorable to the defense of nature. With the results obtained using these two instruments, the descriptive features of the ecological profile of the Spanish samples analyzed are summarized below in Table 1.

The data obtained using the NEP scale for use with child participants confirm that ecocentric beliefs predominate. The mean score obtained in the NEP scale (pro-ecological beliefs) in the studied sample is higher than that obtained by Manoli et al. (2007) in other samples ( $M = 3.58$ ,  $SD = 0.47$ ) and it is even higher than other results that these same authors provide with child samples after having participated in an environmental education camp ( $M = 3.74$ ,  $SD = 0.74$ ). Thus, evidence is obtained that pro-environmental beliefs are established in the sample studied. In addition, in this same study, a significant correlation is obtained between pro-ecological beliefs and pro-environmental actions ( $r = .14$ ,  $p < .01$ ). This is a low correlation and it is in line with the results obtained in this same analysis in adult samples. In relation to these data, the analysis of differences according to age is of interest. In this case, differences are recorded by age groups of the sample studied, with pro-ecological beliefs increasing with age. This result is in line with those obtained in previous studies (Evans et al., 2007) and opens an interesting debate about the role of age in the formation of ecological awareness. Thus, younger children tend to have a more utilitarian and anthropocentric view of nature, based on their own experience. This vision evolves progressively from 10-11 years to a more ecocentric vision (Kellert, 2002). Likewise, it should be pointed out that the analyses carried out do not confirm the existence, in this case, of significant differences according to gender. This result contradicts those



obtained by other authors who have obtained gender differences (for example, Müller, Kals, & Pansa, 2009), highlighting that women are more pro-environmental than men. Finally, the analyses allow us to register significant effects of the place of residence on the ecological awareness. In this case, the participants of the sample living in rural areas obtain a higher score in pro-environmental beliefs ( $M = 4.07, SD = 0.76$ ) than residents in urban areas ( $M = 3.93, SD = 1.27$ ). Thus, it is concluded that, even though there is a high level of ecological awareness in the whole sample, ecological awareness is greater in the older participants who live in rural areas.

The use of the Child Environmental Perception Scale (CEPS) by Larson et al. (2011) helps to complete the ecological profile of the Spanish child population (Collado & Corraliza, 2015). As indicated above, this scale adapted for use with Spanish samples turns out to be one-dimensional and allows us to record what has been called ecological orientation, based on the expression of desires to learn about and defend nature. The results confirmed the high level of ecological orientation that is recorded in the Spanish child samples. Specifically, as can be seen in Table 1, an average score of 4.36 ( $SD = 0.81$ ) is obtained, out of a maximum of 5. This score indicates that participants who express favorable and very favorable attitudes to nature predominate. In a later work, Collado and Corraliza (2016) analyze the influence of age, gender, and place of residence on the ecological orientation. According to the results of the authors, age is related to ecological orientation such that younger children obtained higher scores ( $M = 4.53, SD = 0.41$ ) than older children ( $M = 4.31, DT = 0.50$ ),  $F(1,724) = 19.82, p < .001$ . Similarly, girls showed a higher score ( $M = 4.36, SD = 0.48$ ) than boys ( $M = 4.29, SD = 0.51$ ),  $F(1,831) = 4.68, p < .05$ . Finally, the ecological orientation of the participants was different according to their place of residence,  $F(2,831) = 3.21, p < .05$ . Those living in mountain areas scored higher ( $M = 4.41, SD = 0.45$ ) than city participants ( $M = 4.32, SD = 0.52$ ) and those from predominantly agricultural areas, who had the lowest score, ( $M = 4.27, SD = 0.50$ ). Complementary results have been obtained using an original scale designed by Moreno, Amérigo, and García (2016) for specific application to primary school students.

The data obtained with the CEPS match those obtained with the NEP scale in the general scores measured. Both instruments

allow us to confirm the existence of high scores of Spanish samples in both pro-environmental beliefs and ecological orientation. In addition, the data referring to the variables in which differences are recorded (age, gender, place of residence, among others) allow us to obtain different sociodemographic profiles. Of particular interest are the apparently contradictory results obtained in relation to age if the data obtained with the two instruments are compared. In relation to beliefs measured through the NEP scale, the most pro-environmental participants are older children and those residing in rural areas, with no effect of gender. However, the ecological orientation allows us to obtain a profile in which, even with a high average overall score, age effects are recorded in the opposite direction: younger children (from 6 to 9 years old) obtain a higher average score than older ones (10 to 13 years). The reason for this apparent contradiction is explained by the different contents of the two scales. Whereas the NEP scale mainly collects indicators of the more general (and abstract) understanding of environmental problems (for example, the item "there are too many people on earth for the resources it has" or "nature can withstand the negative effects of our modern lifestyles"), the CEPS is made up of items that indicate a greater personal involvement in environmental problems (for example, "I like to learn about plants and animals" or "my life would change if there were no trees"). We are not concerned with entering into the debate on the validity of the two scales, but rather with emphasizing the fact that both of them allow us to record evidence of different aspects to describe the cognitive and affective contents of child ecological awareness. The first scale registers a set of more abstract beliefs about ecological dynamics, while the second one allows us to obtain information about the personal connection with specific indicators of the relationship with nature. These results suggest that programs to promote ecological awareness in childhood must take into account the stages of evolutionary development in the understanding of the world and the development of morality, characteristic of Piagetian theory. Thus, for example, in the earliest ages learning processes predominate, which are linked to significant egocentric referents. On the other hand, in later stages the capacity of abstract comprehension is developed. Taking into account the results obtained, the NEP scale may be more appropriate for samples of older children (from 11 years

**TABLE 1**  
**MEAN AND STANDARD DEVIATION OF TWO SPANISH SAMPLES THAT RESPONDED TO THE NEP AND CEPS**

	NEP	CEPS
Construct	Pro-environment beliefs	Ecologist orientation
Participants	574	832
Age range	From 8 to 13 ( $M = 11.32, SD = 1.39$ )	From 6 to 12 ( $M = 10.00, DT = 1.30$ )
Response range	1-5	1-5
M (SD)	3.82 (0.57)	4.36 (0.81)

Source: NEP (Corraliza, Collado, & Bethelmy, 2013), CEPS (Collado & Corraliza, 2015).



of age onwards), while for samples of younger children the application of the CEPS could be more relevant.

**Ecological awareness profiles in Spanish children**

The results presented above allow us to confirm that, in general terms, the beliefs and criteria of the ecological orientation of Spanish children are clearly pro-environmental. However, the high means recorded should not suggest that childhood is a unit and that the ecological awareness determines uniform models of beliefs and pro-environmental behaviors. This raises the question of whether, even when assuming widespread pro-ecological beliefs, these beliefs act as a single motivational pattern or, on the contrary, it is possible to identify different patterns that, in turn, describe different profiles of ecological awareness in childhood. On the other hand, in the study of environmental attitudes and beliefs, a multitude of scientific evidence has been recorded that shows the difficulties in predicting pro-environmental behavior based on this evidence. Thus, it is necessary to take into account other variables that describe specific characteristics of the environmental experience of the sample studied. In this sense, the authors of this work propose a tentative model that describes different ecological profiles in the child population. In line with a previous contribution (Collado & Corraliza, 2016), this model allows us to establish different population groups by combining the level of environmental awareness with a descriptive parameter of the environmental experience of the child population. Defining and identifying these typologies is of great interest in establishing programs of educational intervention and promotion of ecological awareness.

To define these profiles, the data from the study carried out with the CEPS (Collado & Corraliza, 2015) were used. In this study we collected data on the frequency of direct contact (visits or stays) with natural environments, as well as the information provided by the CEPS. The correlation between the ecological orientation and the frequency of contact with nature was  $r = .33$ ,  $p < .01$ . Taking into account the data obtained, the sample was

divided into four groups according to two criteria: ecological orientation (high or low) and frequency of visits/stays in nature spaces (high or low) (Table 2). These four groups can be understood as different profiles of ecological awareness.

The first profile has been named the eco-oriented group. The participants of this group are characterized by having a high score in ecological orientation and also a high score in the registration of frequencies of visits and stays in natural spaces. They represent 22.4% of the sample studied, and it could be said that this is indeed the most clearly pro-environmental group, which suggests that it is the profile that would also obtain a higher score in pro-environmental behaviors. In contrast to this group we find the techno-oriented participants. They are characterized by having a low ecological orientation and low frequency of contact with nature. This is the profile that is most resistant to the adoption of criteria and patterns of pro-environmental behavior. This is the majority percentage group of the sample and accounts for 42.4% of the total number of participants studied. It can be said that both the eco-oriented group and the techno-oriented group are characterized by the existence of congruence between their beliefs and their environmental experiences, although obviously in opposite directions.

In addition to these two groups, the proposed scheme identifies two others characterized by the existence of a certain contrast between environmental beliefs and experience. Thus, the lounge ecologists are characterized by having a high score in ecological orientation and a low frequency of contact with nature. The profile of this group is characterized by taking on the ideas of pro-environmentalism, but they may not have many opportunities to have experiences of contact with nature. It is assumed that in this group the demands of the ecological "doctrine" predominate, but perhaps they do not have significant experiences that act as motivational elements for the pro-environmental behavior. The last group, the utilitarians, is the group that has a low ecological orientation but, nevertheless, their frequency of contact with nature is high. It is characterized by a more utilitarian vision of nature (for example, groups of children who visit nature to perform recreational or sports activities or who collaborate in work linked to the rural world). Also in this group, there is a certain contradiction between beliefs and significant experiences.

A central question is whether these different profiles allow us to predict different levels of involvement and practice of pro-environmental behaviors. In this sense, Collado and Corraliza (2016) found that the means of ecological behavior of all groups of children were significantly different ( $p < 0.001$ ), except for the utilitarian and techno-oriented groups, whose means were not significantly different. The group with the highest frequency of pro-environmental behaviors is the eco-oriented group ( $M = 4.76$ ,  $SD = 0.32$ ) followed by the lounge ecologists ( $M = 4.53$ ,  $SD = 0.43$ ). The lowest means of pro-environmental behavior are recorded in the two remaining profiles: the utilitarians ( $M = 4.12$ ,  $SD = 0.50$ ) and the techno-oriented group ( $M = 4.01$ ,  $SD = 0.53$ ).

**TABLE 2**  
**PROFILES OF CHILDREN ACCORDING TO THEIR ECOLOGICAL ORIENTATION AND FREQUENCY OF CONTACT WITH NATURE (N = 828)**

		Ecological orientation	
		Low	High
Frequency of contact with nature	Low	Group 1 Techno-oriented 42.4%	Group 2 Lounge ecologists 27.7%
	High	Group 3 Utilitarians 7.5%	Group 4 Eco-oriented 22.4%

Source: Collado and Corraliza (2016, p. 138)



As discussed in the previous lines, the model is tentative, as are the labels that are used to describe the profiles of the four resulting groups. It is offered with the aim of opening up a discussion that is strategically decisive in identifying differentiated objectives and programs of psycho-environmental and educational intervention, also with differentiated resources according to the profile of the target population. In addition, it allows us to argue the value of, together with structured beliefs, an indicator of environmental experience such as the frequency of contact with natural spaces.

**CONCLUSION**

The main purpose of this work is to show the importance that childhood experiences have in the development of ecological awareness. One of the derivatives of this argument is that it is not enough to carry out intervention programs based on the dissemination of information and environmental knowledge. It is also necessary to promote significant experiences that act as motivating elements to develop and maintain the levels of ecological awareness registered in these studies. Noteworthy within these significant experiences is the value of experiences of contact with the stimulation provided by nature. In this sense, it is necessary to evaluate the role that contact with nature (and not only learning and knowledge) has in the formation of ecological awareness. In fact, recorded empirical evidence of the evolution of the ecological awareness of children participating in four summer camps (urban and in nature, and with and without formal environmental education programs), shows that staying in natural settings increases the pro-environmental attitudes and the intention to adopt more ecologically responsible behavior (Collado, Staats, & Corraliza, 2013). However, whether there is a formal program of environmental education in the camp or not does not produce changes in the ecological awareness of the participants.

This type of data, registered with the assessment instruments available for use with the Spanish population (NEP and CEPS), shows the need to define programs and resources to recuperate the contact with natural or naturalized scenarios in childhood.

From what we have exposed in this work the relevance can be deduced of at least three proposals of psychological evaluation and intervention, especially in the levels of primary and secondary education. The first one refers to the need to evaluate the daily life agenda of children and its relationship with children’s health, taking into account the beneficial effects that direct contact with the stimulation of nature has, for both psychological well-being and for moral development and the development of ecological awareness. Secondly, it is necessary to formulate proposals for the naturalization of the school curriculum, especially in the areas of primary and secondary education, in line with intuitions formulated more than one hundred years ago by educational traditions such as the *Institución Libre de Enseñanza* [Free Institution of Education] in Spain. And, finally, within psychological care teams it is necessary to evaluate the quality of everyday life scenarios (public spaces, parks, school playgrounds, among others), and

the need to naturalize these scenarios, so that the presence of referents of nature is not a mere adornment, but a resource to deal with the overdemands and stressful experiences that often characterize the daily life of children.

**CONFLICT OF INTERESTS**

There is no conflict of interest.

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