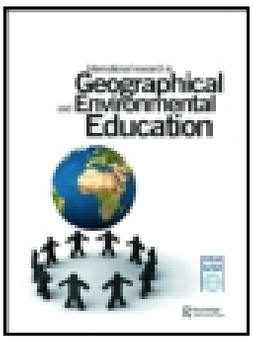

International Research in Geographical and Environmental Education

ISSN: 1038-2046 (Print) 1747-7611 (Online) Journal homepage: https://www.tandfonline.com/loi/rgee20

Why it is important to protect the environment: reasons given by children

Dovilė Šorytė & Vilmantė Pakalniškienė

To cite this article: Dovilė Šorytė & Vilmantė Pakalniškienė (2019): Why it is important to protect the environment: reasons given by children, International Research in Geographical and Environmental Education, DOI: 10.1080/10382046.2019.1582771

To link to this article: https://doi.org/10.1080/10382046.2019.1582771

INTERNATIONAL RESEARCH IN GEOGRAPHICAL AND ENVIRONMENTAL EDUCATION
https://doi.org/10.1080/10382046.2019.1582771

Why it is important to protect the environment: reasons given by children

Dovilė Šorytė and Vilmantė Pakalniškienė

Institute of Psychology, Vilnius University, Vilnius, Lithuania

ABSTRACT

Though the significance of involving children in environmental sustainability efforts is widely acknowledged, we still lack evidence on what they think of environmental issues and about the protection of nature. The aim of the paper is to systematically describe the reasons that children give for protecting the environment. Thirty-three children (aged 6–11 years) participated in one of the six focus groups. Method of qualitative content analysis was used for analyzing the data. Study findings showed that participants were aware of some of the environmental problems or environmentally harmful behaviour like litter and pollution. Moreover, the study participants had various views about the importance of nature protection like maintaining clean environment, protecting human life and health, or protecting animals and plants. The reasons they gave for environmental protection were related to both humans and other parts of the nature. Furthermore, the participants learned about nature protection from sources like family, school, various literature sources, computer games, television and by watching how others behaved. Implications regarding results of the study are presented further in the paper.

KEYWORDS

Environmental education; children; environmental knowledge; environmental understanding; nature protection; environmental protection

Introduction

The significance of children's views on environmental issues has gained increasing attention because of the recognition of children as important actors in addressing these issues. Children are members of the next generation that will experience either the success or failure of current environmental sustainability efforts (Barraza & Robottom, 2008). As present and future citizens, children are affected by environmental decision-making and have a right to be involved in it (Barratt Hacking, Barratt, & Scott, 2007). "Researchers, teachers, parents and policy makers have a responsibility to acknowledge the contribution of young children. In doing so, children's voices are valued and their creative solutions and enthusiasm for action become a force for the further development of early childhood programmes that integrate sustainability and early childhood policies at a local and national level" (Mackey, 2012, p. 483).

CONTACT Dovilė Šorytė dovile.soryte@fsf.vu.lt Institute of Psychology, Vilnius University, Universiteto 9, Vilnius 01513, Lithuania

Furthermore, the younger the age at which they become interested in conserving the environment, the more likely they will be to support public projects for ecological well-being when they grow up and become voting citizens (Honig & Mennerich, 2012). Therefore, it is important to involve individuals in environmental protection efforts from childhood, and to do so, there is a need to analyze children's understanding of the environment and environmental issues.

The nature of pupils' conceptions concerning life and ecology are crucial in determining what needs to be taught in schools (Brody, 1991). Environmental education (EE) in schools is seen as an important strategy in achieving environmental protection (Loughland, Reid, Walker, & Petocz, 2003). One of the major goals in education is to prepare young children for the future; such education provides the opportunity for empowerment, so that children can work towards their chosen future (Barraza, 2001). However, when designing appropriate learning experiences for students, teachers should have some understanding of children's existing knowledge, skills and concepts, in order to build upon these in a meaningful and progressive way (Palmer & Suggate, 2004). Contrary to a so-called 'top-down' model, teaching should be built on a 'bottom-up' approach, which considers the ideas pupils bring with them and which lets the children have some control over their own learning (Mackintosh, 2005). Therefore, EE needs to be based on children's understandings of environment rather than on assumptions of what they know and believe (Loughland et al., 2003). Moreover, it is important to emphasize that children and adults hold different understandings about nature (Hyun, 2005). Thus, in order for EE to be successful, it must be linked to what particular ideas children hold about the issues under consideration.

Research shows that children are able to understand relationships in the environment and effects of environmental change on nature. Children as young as 3 years of age view environmental behaviours in moral terms, i.e. they believe that environmentally harmful behaviours are wrong (Hahn & Garrett, 2017). At the age of 4 they are already capable of making simple but accurate statements about the effects of significant environmental change on habitats and living things (Palmer & Suggate, 2004). Furthermore, Palmer and Suggate (2004) point out that as children mature between the ages of 4 and 10 they are able to take a longer-term view of environmental issues and to make meaningful links between the causes and effects of those issues. According to Barraza and Robottom (2008), who analyzed children's drawings of biodiversity, primary school students of 10 to 12 years have basic skills to depict elements of biodiversity. In addition, 8-year-olds as well as 11-year-olds can think systematically in regard to environmental problem solving; their understanding of the relationships in the environment is quite advanced and more sophisticated than traditional developmental theory suggests (Wylie, Sheehy, McGuinness, & Gerry, 1998).

According to Piaget's theory of intelligence development, after the age of 4 to 7 or 8 years, which is described as pre-logical and intuitive, children of around 7 to 12 years of age are capable of logical thinking or so-called 'concrete operations' (Piaget, 1981). Moreover, in the stage of concrete operations, children become less egocentric and less self-centered. Piaget's work was one of the theoretical foundations for constructivism – a theory that defines learning as an 'interpretive, recursive, nonlinear building process by active learners interacting with their surround – the

physical and social world' (Fosnot & Perry, 2005, p. 34). On this basis, teachers need to allow learners to generate their own questions, hypotheses and models, to test them out for viability, and defend and discuss them in communities of discourse and practice. Although the theory of intelligence development had a profound impact on how we view children, further research has indicated that Piaget often underestimated the cognitive competencies of children (Bjorklund, 2005). In general, empirical work gives strong evidence on the ability of children to understand various aspects of environment. As previously mentioned, our knowledge of children's environmental understanding is necessary to be able to develop appropriate education programmes for achieving environmental protection.

We still lack knowledge about what children think of environmental issues such as global warming, or environmental protection such as conservation of earth's resources (Honig & Mennerich, 2012). Moreover, we also lack evidence on what leads them to think, feel and behave in a pro-environmental manner (Collado, Evans, & Sorrel, 2017). This paper will extend the literature related to the questions of what ideas children have about environmental issues and nature protection. Specifically, we aim to systematically describe the reasons that children give for protecting the environment. This might contribute to a better understanding of what children think about the effects of environmental issues as well as what motivates them to protect nature. In this paper, we first briefly present children's knowledge of environmental problems or environmentally harmful behaviours, then we describe various reasons they give for addressing those problems. We also describe where children learn about these issues and environmental protection.

Materials and methods

Study participants and procedure

A total of 33 children (aged 6 to 11 years; 18 girls and 15 boys) participated in the study. They took part in one of the 6 focus groups which were conducted in Vilnius, the capital and the biggest city of Lithuania. Three focus groups took place during a summer camp; the other three groups were conducted during school lessons in one public primary school. Group interviews were approximately 20 minutes long and each interview was audio recorded and then transcribed verbatim. The number of participants in each group was from 3 to 7. There was only one child of 6 years old while the majority of the participants were between nine and ten years of age. All except one of the groups (the one with 3 participants had only boys) had participants of both boys and girls.

During group interviews, children already knew the interviewer, who met them once in advance to get acquainted, to introduce the purpose and procedure of the study, and to deliver necessary information addressed to the parents, i.e. children were asked to bring the written consent forms back to their parents to be filled out. Camp leaders and school teachers helped in the process of collecting the forms later on. The participants were only those children whose parents have given written consents and those who themselves wanted to participate. The interviews took place in quite spaces – empty classrooms or staff rooms. At the beginning of each focus

group, the interviewer explained the importance of participants' personal views and that there were no wrong answers. Audio recording and data protection issues were also explained to the children. The proceeding of each group interview was flexible and adapted to particular children and situations, though questions were prepared in advance, i.e. 'What do you know about the things that people do in order to protect the environment (or nature)?'; 'Why do you think environmental (or nature) protection is important?'; 'Where did you learn about the issues and nature protection?'; 'What do you yourselves do to protect the environment?' (The analysis of current paper was mostly based on all the questions except the last one). Furthermore, the interviewing style was neutral and non-judgmental; the interviewer tried to use language that was appropriate for children's age.

Analysis

The method of qualitative content analysis (Schreier, 2012) was used to systematically describe the meaning of the qualitative material. To achieve this, the material is structured to a coding frame that consists of main categories or dimensions (higher level analysis), their subcategories (lower level analysis), and residual categories. The latter comprised of various information that is related to the research question though not clearly attached to any of the categories, or has only been mentioned once.

Reliability and trustworthiness of data analysis was assessed twice according to the procedure, i.e. following the pilot and the main phase of the analysis. For the main phase, intra-coder reliability, which reflects stability of the analysis over time, was at 80%. Furthermore, to achieve face validity, we followed the procedure of revising coding frequencies of the residual categories, coding frequencies of the subcategories, and the level of abstraction of the coding frame (Schreier, 2012).

It should be noted that study participants and the interviewer communicated in their mother tongue language, thus, all the examples of children's statements provided has been translated to English for the paper.

Results

Participants in the study mentioned some environmental issues/environmentally harmful behaviours, i.e. litter, air and water pollution (caused by cars, factories, and oil), as well as inappropriate behaviour to animals and plants like poaching and cutting trees. Disfigurement of the environment like drawing on the walls, gluing chewing gum on any surface, leaving scrap glass in public places, and breaking public facilities, e.g. benches or playground facilities, was also linked to environmentally harmful actions by the children. There were few more issues that were mentioned either by one participant or a group (these were attached to residual categories) namely, long waste decomposition, fires caused by humans, non-ecological product spray, and food waste. Environmentally harmful actions as well as people who behaved in such manner were judged as 'bad', whereas people who did not (e.g. did not litter) were judged as 'good' by the children.

Table 1. Children's responses to the question 'Why do you think environmental (or nature) protection is important?'.

Subcategory	Examples of statements	Frequency*
Maintenance of clean environment/air and reduction of pollution	'… it is very important [to protect the environment], otherwise nature would be dirty.'	6
Protection of human life and health	'Because human health is important to me, so that people don't get sick.' / [researcher] 'How do you think nature protection is related to human health?' / 'Because of bacteria.' / [other participant] 'Because of air. Because of air. If one fires up the trees, those trees produce bad air.' /[third participant] 'Maybe most of the medicine is made from plants? < … > If there was no nature, there would be no medicine, too.'	4
Protection of animals and plants	'One must not litter in a forest so that animals don't get into trouble and don't die.'	4
Maintenance of humans' daily life and entertainment	'… sometimes [I] think what if that happens to me that I could not go anywhere, and could not swim because of brown water.'	4
Prevention of a possible end of the world	'… it seems to me that if ozone layer becomes thinner, eventually there will be nothing left from it and the cosmos will come to us, and it will exterminate all the trees. There will be no more oxygen left then.'	3
Aesthetic reasons/importance of experiencing nature	'… who would like to walk and see plenty of litter … all the planet would look ugly then and it would also be very bad for the planet itself.'	3
For fires' prevention	'If we simply threw down some glass or scrap glass, everything, all the meadows would catch fire, and it would be dirty all around.'	3

*Number of focus groups where the subcategory was mentioned (out of 6 groups in total).

Further, study participants mentioned various reasons for why it is important to protect nature. Subcategories representing the reasons are shown in Table 1, which also shows examples of children's statements, and the number of focus groups where the subcategories were mentioned. Furthermore, participants learned about nature protection from a few sources, such as parents and grandparents, from school and various literature like books, encyclopedia, and nature journals, through computer games, television; and by watching how others behave. Moreover, there were few children who said that they knew it by heart, or they always knew/were aware of it.

Children's responses about the importance of environmental protection were categorized into 7 subcategories. The only residual category consisted of answers mentioned only once during group interviews. These were protection of human property (e.g. car tire might explode because of rubbish lying on the street), prevention of migration (i.e. citizens might start migrating to other countries because of environmental problems), avoidance of negative evaluation of tourists, who might see pollution in the country, experiencing effects of environmental problems personally (i.e. one participant mentioned sometimes experiencing lack of oxygen), pity for people managing the environment, and because what is valuable in nature (e.g. some herb) deprive of its valuable characteristics when taken from it. Moreover, one participant said 'it is forbidden to litter in nature'.

Description of the subcategories is presented further here.

Maintenance of clean environment/air and reduction of pollution

According to the participants, if people did not care about the environment, they would lack air to breath and the world would be 'dirty' and drowned in rubbish. To prevent this, one has to protect trees and not litter.

Protection of human life and health

Children linked environment with human health through a few aspects: bacteria, air, and medicine. Furthermore, participants mentioned that people might get hurt due to scrap glass or other litter left on land or in water, or small children might put rubbish found in playground to their mouths. Additionally, environmental issues might be a threat to human life, because of the extinction of animals (e.g. bees) or harm caused to plants – this might lead to a lack of air, water and food, like meat, bread or honey. Harm to humans (and animals) might also be caused by fires as a consequence of smoking.

Protection of animals and plants

Threat to animals and plants was linked to littering, cutting trees, and pollution. First, children shared their thoughts about the negative effects of litter on trees, which might cause contamination of the trees, and on animals, which might cause 'trouble' to the animals. Second, cutting trees in forests could result in death or damage to animals because of a risk of trees falling on them or destroying their home, e.g. bird nests. Children thought it was necessary to grow new trees in place of the ones that were cut down so that animals could continue living in the forests. Third, participants mentioned risk of water being polluted with oil or the risk of 'chemical materials' to animals (e.g. birds, fish) and environment in a broader sense. Finally, it is important to protect nature, otherwise animals and plants might go extinct. It is also worth mentioning that though children were concerned about protecting trees, they also mentioned that humans need wood for various reasons like making fire, building houses, making paper and furniture, and that forest are also cut for expanding cities.

Maintenance of humans' daily life and entertainment

Environmental issues were linked by children to a risk of losing their places of entertainment (e.g. they might not be able to slide down the hills or go swimming because of 'brown' water), and to a risk of more complicated housework for adults (e.g. they might not be able to go shopping or pay taxes, or make laundry because of pollution). Additionally, the study participants related environmental issues to a risk of unpleasant experiences like bad smell caused by litter. Children said it was 'more pleasant' to walk in clean environment, and to breath clean air.

Prevention of a possible end of the world

Children thought environmentally harmful actions could cause the end of the world. It might happen because of the lack of oxygen (as a consequence of cutting trees) or because of the impact on the ozone layer. The latter was explained by children through a few scenarios, i.e. that cosmos could 'come to us', that meteorites could 'fall on us', or the ozone layer could simply tear apart.

Aesthetic reasons/importance of experiencing nature

According to study participants, environmental issues like pollution can have an effect on winters, i.e. winters can become 'brown' or 'black' instead of white. Therefore, it is especially important to avoid polluting during winter time. Furthermore, children thought that it might be impossible to touch natural objects like stones because of environmental problems. One study participant even said that 'nature is important for the soul'.

For fire prevention

The last subcategory represents children's answers about the importance of protecting environment in order to prevent fires. Children mentioned that forest and meadow fires are caused by cigarettes, scrap glass, and by making fires in inappropriate places. They also linked fires to dirt in the environment.

To sum up, children gave various reasons for protecting the environment. Those reasons were related to both humans and other parts of the nature, e.g. animals and plants.

Discussion

This study was trying to explore children's reasoning about the importance of protecting the environment. Findings of our study showed that children could grasp various effects of environmental issues on nature (Palmer & Suggate, 2004) and were able to understand relations in the environment (Littledyke, 2004; Madden & Liang, 2017), for example, that litter causes harm to plants and animals, including to humans. Thus, children who participated in this study were capable of understanding the importance of nature protection. It corresponds to the theoretical basis, i.e. that children who enter the stage of concrete operations are capable of logical reasoning (Piaget, 1981). The main reasons that children gave for protecting the environment were related to both humans and other parts of the nature.

In terms of the human-related reasons, children thought that protecting nature is important for their health and for maintaining their daily life as well as the quality of life (e.g. breathing in pleasant air). Furthermore, the environment was viewed as critical to the survival of the human race, for example by providing people with oxygen, or having animals as a source of food (Bonnett & Williams, 1998). Answers given by children showed they were capable of pro-social reasoning about the importance of environmental protection, because they gave reasons related to community well-being

(Honig & Mennerich, 2012). According to Honig and Mennerich (2012), children's awareness of and active participation in conserving the environment can be considered as a further aspect of pro-social behaviour. Children also mentioned the importance of maintaining sources of entertainment that are found in nature, like hills or swimming places. Similarly, Bonnett and Williams (1998) found that children tended to compare natural places in terms of their suitability for playing games, indicating that their evaluation of places is heavily conditioned by what they feel they can do there. Other reasons for protecting nature, as indicated by study participants, pointed to the importance of experiencing nature, like touching its elements (e.g. stones), and to the importance of the aesthetic qualities, i.e. keeping winters white, instead of snow coloured in 'brown' or even 'black'. Kahn and Lourenço (2002) have demonstrated that children conceive various environmental justifications that include anthropocentric appeals like personal interests, human welfare, and aesthetics. Thus, our findings are in accordance with the evidence that children are able to reason pro-socially about the importance of environmental protection, and that they hold various anthropocentric appeals related to the environment.

In terms of the second group of the reasons mentioned, children emphasised the importance of protecting animals, plants, and environment in a broader sense. First, they described various scenarios in which animals might be harmed, for example by litter or by the impact of cutting down trees, implying an understanding that certain species may depend on particular habitats (Bonnett & Williams, 1998). Children's concern for animals is likely to be influenced by the identification which they have for pets as well as with the anthropomorphic representations of animals that are extensively portrayed in children's literature, film and TV programmes (Littledyke, 2004). According to Melson (2013), a child's relationship with family animals is an important social experience because of the role that pets play in family interactions, including discussions about moral issues. In addition, relating appropriately to an animal requires attending to, and understanding a perspective very different from that of children, which may in turn promote their empathy and moral reasoning (Melson, 2013). Second, children expressed concern for the welfare of trees as well as an understanding that trees are used as a resource for making paper or expanding cities, etc., thus, recognising conflicting motives behind the issue (Bonnett & Williams, 1998). Research shows that pre-school children have limited knowledge about concepts of forest and deforestation (Ahi & Balci, 2018). However, as children became older, more of them realize that trees are cut down primarily for people's convenience and use, and know more of the long-term effects of deforestation on creatures (Palmer & Suggate, 2004). Finally, other reasons indicated by study participants were related to nature in a broader sense, like maintaining clean air and clean environment, reducing pollution, preventing possible end of the world, and similarly, preventing fires. Scientific evidence shows that children from diverse cultures see pollution as one of the most important environmental problems (Barraza, 2001). Moreover, anticipation of the end of the world proves that children might be concerned and pessimistic about future (Barraza, 1999). Therefore, answers given by children demonstrated that they were not only capable of anthropocentric, but also of biocentric reasoning, e.g., that nature has intrinsic value (Kahn & Lourenço, 2002).

Results also showed that children knew of various issues like air and water pollution, litter, and inappropriate behaviour to animals and plants, like poaching and cutting trees (Barraza & Robottom, 2008; Brody, 1991; Kahn & Lourenço, 2002; Littledyke, 2004). Other issues like waste and fires (Barraza & Robottom, 2008; Littledyke, 2004), as well as non-ecological product spray, were mentioned briefly. Furthermore, children viewed environmental behaviours in moral terms (Hahn & Garrett, 2017), i.e. they judged people behaving in environmentally harmful way as 'bad'. Children's knowledge of particular problems might occur in relation to several reasons introduced further.

As previously mentioned, children show concern for the welfare of animals and trees; animals (both domestic and wild) and plants are important to children (Bonnett & Williams, 1998; Kahn & Lourenço, 2002). They are also concerned about the issues of pollution, litter and waste (Barraza, 2001; Littledyke, 2004). Thus, participants' knowledge of particular environmental problems might be related to what they feel concerned about and also to what is important to them. However, we have to note that we did not specifically ask the participants about the sources of their concern, thus, we can only assume that. In terms of the other possible reasons behind the children's knowledge, it is worth mentioning that in Lithuania, pollution is an important issue considering the Baltic Sea, which is amongst the most polluted seas in the world (Lithuanian Fund for Nature, n.d.). Air pollution might also be relevant in view of the fact that diesel-driven cars exceed the 50% threshold car ownership in the country (Eurostat, 2017). Waste treatment is another issue in Lithuania. Though level of waste generation in the country is lower compared to the European Union (EU), the country still disposes about two thirds of the total waste by landfilling (Eurostat, 2017). Indeed, little of the waste in Lithuania is treated by recovery operations like recycling, and the country could do better in material use rate (Eurostat, 2018). However, it is important to mention that the recycling rate of municipal waste in Lithuania has grown tenfolds in the last decade and has exceeded the average EU level (Eurostat, n.d.). Interestingly, participants also indicated disfigurement of the environment (such as drawing on the walls or breaking public facilities) as an environmentally harmful action. It might reflect what they have observed in their near surroundings and what they have identified as a problem in the environment. For children as well as for adults, the concept of environment not only refers the natural, but it is also about the built and social environment (Jeronen & Kaikkonen, 2002). Whereas the study was conducted in the city, it is worth mentioning that children in urban areas are more likely to use the built environment, for example public places and playgrounds, and their experiences in their locality contribute to a range of cognitive and affective dimensions in the children's learning (Pike, 2011).

According to the children, they learned about the problems mentioned above from their family members, school, computer games, various literature sources, television, as well as by watching the behaviour of others. Some of them also said that they simply 'knew it from within'. The children's answers corresponded to the findings of other authors, who emphasized that the environmental knowledge and awareness of children is influenced by their parents, school, books and the media (Bonnett & Williams, 1998; Littledyke, 2004; Rickinson, 2001). It also corresponded to social

learning theory by Bandura (1969). Based on the theory, it can be assumed that parents and other significant persons in the child's surrounding may contribute to the development of pro-environmental behaviours by serving as social models (Matthies, Selge, & Klöckner, 2012). In addition, problems mentioned by the participants might represent the knowledge areas that are introduced to Lithuanian pupils according to the primary school curriculum, for example, prevention of pollution or taking care of living beings (Ministry of Education and Science of the Republic of Lithuania, 2017).

Research findings, however, also showed some limitations or misconceptions that children held regarding environmental issues and environmental protection. For example, they mentioned that winters (i.e. snow) might become brown or black because of the pollution, thus, people ought to avoid polluting at winter time in particular. As demonstrated by Österlind and Halldén (2007), pupils determine pollution by what they perceive through their senses, i.e. they refer to pollution as dirt, as something visible. Thus, when children see the muddy water, they conclude that the quality of the water is poor (Österlind & Halldén, 2007). Other authors have also demonstrated that children's attitudes towards environment can involve a number of limitations, dichotomies and ambivalences (Bonnett & Williams, 1998), and they might have misconceptions regarding environmental issues, such as pollution or global warming (Littledyke, 2004; Palmer & Suggate, 2004). Similarly, children might hold misconceptions about the importance of pro-environmental behaviour. For example, Bonnett and Williams (1998) showed that 5th and 6th graders were unsure as to how recycling helps the environment. Causes of children's misconceptions are related to the nature of their thinking, and the impact of various external influences such as school textbooks and media (Rickinson, 2001). Therefore, the results of the current study support the evidence that children understand various aspects of the environment; however, their understanding might not be very accurate and it points to the importance of providing children with appropriate environmental education.

Implications on environmental education and research

Implications that derive from the study point out to the significance of discussing various reasons for nature protection with young learners. First, it might help children to better understand various effects of environmental problems on nature, and significant relations in the environment, especially bearing in mind possible misconceptions that young learners can have. Second, it might enable educators to better understand what motives young citizens hold for protecting the environment, and to apply it when promoting children's pro-environmental attitudes and behaviours. Understanding how children perceive nature and environmental issues may assist educators in planning early year environmental education experiences and in providing meaningful learning experiences that foster active environmental concern at an early age (Keliher, 1997). Third, knowledge of children's reasoning might help researchers in developing appropriate research instruments for measuring children's understanding for we still lack knowledge about what children think of

environmental protection and what leads them to behave pro-environmentally (Collado et al., 2017; Honig & Mennerich, 2012).

Authors point to several directions when educating children to become environmentally aware and active. Important aims of EE should be to foster environmental sensitivity, environmental awareness and knowledge, and to acquire readiness and responsibility to solve environmental problems through action for the environment (Jeronen & Kaikkonen, 2002). According to Littledyke (2004), it is important to choose topics which are relevant and interesting to children, and which provide vehicles for environmental education, e.g. waste, animals, pollution, or transport, to introduce scientific concepts that explain connections of cause and effect, to promote empathy and care for living things, to introduce consideration of environmental moral issues that take into account the effect on ecosystems as well as the social impact in environmental issues etc. Furthermore, children should be empowered to feel competent to care for the environment (Chawla & Cushing, 2007), and specifically, gain action competence to be able to make change (Jensen, 2002). Conducting EE in natural settings and providing children with direct nature experiences seem to be of particular value (Ahi & Balci, 2018; Keliher, 1997; Mackintosh, 2005). Educators, however, should also appreciate the likely nature and predominance of children's preconceptions, including their misconceptions, because teaching strategies can then be targeted to address their needs and to reinforce their scientific notions (Boyes & Stanisstreet, 1997). Therefore, it is important to provide children with appropriate environmental education in consideration of their current understanding. One of the topics worth discussing with young learners may be the reasons behind environmental protection efforts. For example, children's awareness of the vulnerability of organisms and ecosystems to increasing global warming may be one of the motivators in altering their behaviours in a more environmentally sustainable fashion (Kilinc, Eroglu, Boyes, & Stanisstreet, 2013).

Limitations

The current study, however, has its limitations that are important to take into account when assessing the results. First, we tried to organize focus groups so that participants would be as similar as possible in regard to their age. Despite that, it was only partially achieved and could have an effect on what particular thoughts children shared or how freely they felt during group interviews. Likewise, interviewing children might include such risks as participants' desire to please the interviewer by providing what seems to be a 'good' response, or peer pressure to conform to friends' views (Littledyke, 2004). Second, the interviewer did not attach particular statements to the individual study participants, thus, it was impossible to further analyse the data according to individual characteristics of children, e.g. their age. Thus, research findings are limited in several aspects, and further qualitative and quantitative studies might help to analyze the subject deeper and in more detail.

To summarize, children hold various ideas about the importance of environmental protection, and are capable of understanding different, though interconnected reasons for protecting nature. The reasons they are capable of verbalizing this understanding,

include both pro-social and anthropocentric as well as biocentric ones. Therefore, similar to Mackey's (2012) findings, it is important to acknowledge the unique contribution that young citizens have in acting for a more sustainable world.

Acknowledgements

We would like to thank study participants for sharing their thoughts during group interviews, and for their parents for giving their consents to that. We would also like to thank camp and school leaders and teachers, who helped in the process of collecting written consent forms from the parents and who allowed the researcher to interview children during the camp or class time.

Declaration of interest statement

No conflict of interest was reported by the authors.

References

Ahi, B., & Balci, S. (2018). Ecology and the child: Determination of the knowledge level of children aged four to five about concepts of forest and deforestation. *International Research in Geographical and Environmental Education*, *27*, 234–249.

Bandura, A. (1969). Social-learning theory of identificatory processes. In D. A. Goslin (Ed.), *Handbook of socialization theory and research* (pp. 213–262). Chicago, IL: Rand McNally & Company. Retrieved from http://www.uky.edu/~eushe2/Bandura/Bandura1969HSTR.pdf

Barratt Hacking, E., Barratt, R., & Scott, W. (2007). Engaging children: Research issues around participation and environmental learning. *Environmental Education Research*, *13*, 529–544.

Barraza, L. (1999). Children's drawings about the environment. *Environmental Education Research*, *5*, 49–66.

Barraza, L. (2001). Perception of social and environmental problems by English and Mexican school children. *Canadian Journal of Environmental Education*, *6*, 139–157.

Barraza, L., & Robottom, I. (2008). Gaining representations of children's and adults' constructions of sustainability issues. *International Journal of Environmental & Science Education*, *3*, 179–191.

Bjorklund, D. F. (2005). *Children's thinking: Cognitive development and individual differences* (4th ed.). Wadsworth, OH: Belmont.

Bonnett, M., & Williams, J. (1998). Environmental education and primary children's attitudes towards nature and the environment. *Cambridge Journal of Education*, *28*, 159–174.

Boyes, E., & Stanisstreet, M. (1997). The environmental impact of cars: Children's ideas and reasoning. *Environmental Education Research*, *3*, 269–282.

Brody, M. J. (1991). Understanding of pollution among 4th, 8th, and 11th grade students. *The Journal of Environmental Education*, *22*, 24–33.

Chawla, L., & Cushing, D. F. (2007). Education for strategic environmental behavior. *Environmental Education Research*, *13*, 437–452.

Collado, S., Evans, G. W., & Sorrel, M. A. (2017). The role of parents and best friends in children's proenvironmentalism: Differences according to age and gender. *Journal of Environmental Psychology*, *54*, 27–37.

Eurostat (2017). *Energy, transport and environment indicators.* Luxembourg: Publications Office of the European Union.

Eurostat (2018). *Sustainable development in the European Union: Monitoring Report on Progress towards the SDGs in an EU Context.* Luxembourg: Publications Office of the European Union.

Eurostat. (n.d.). Sustainable development indicators. Retrieved from https://ec.europa.eu/eurostat/web/sdi

Fosnot, C. T., & Perry, R. S. (2005). Constructivism: A psychological theory of learning. In C. T. Fosnot (Ed.), *Constructivism: Theory, perspectives, and practice* (2nd ed., pp. 8–38). New York: Teachers College Press.

Hahn, E. R., & Garrett, M. K. (2017). Preschoolers' moral judgments of environmental harm and the influence of perspective taking. *Journal of Environmental Psychology*, *53*, 11–19.

Honig, A. S., & Mennerich, M. (2012). What does 'Go Green' mean to children?. *Early Child Development and Care*, *183*, 171–184.

Hyun, E. (2005). How is young children's intellectual culture of perceiving nature different from adults'? *Environmental Education Research*, *11*, 199–214.

Jensen, B. B. (2002). Knowledge, action and pro-environmental behaviour. *Environmental Education Research*, *8*, 325–334.

Jeronen, E., & Kaikkonen, M. (2002). Thoughts of children and adults about the environment and environmental education. *International Research in Geographical and Environmental Education*, *11*, 341–353.

Kahn, P. H., & Lourenço, O. (2002). A developmental study in portugal of environmental moral reasoning. *Environment and Behavior*, *34*, 405–430.

Keliher, V. (1997). Children's perceptions of nature. *International Research in Geographical and Environmental Education*, *6*, 240–243.

Kilinc, A., Eroglu, B., Boyes, E., & Stanisstreet, M. (2013). Could organisms and ecosystems be used as motivators for behaviour to reduce global warming? The views of school students. *International Research in Geographical and Environmental Education*, *22*, 191–208.

Lithuanian Fund for Nature. (n.d.). The Baltic Sea. Retrieved from http://www.glis.lt/?pid=118

Littledyke, M. (2004). Primary children's views on science and environmental issues: Examples of environmental cognitive and moral development. *Environmental Education Research*, *10*, 217–235.

Loughland, T., Reid, A., Walker, K., & Petocz, P. (2003). Factors influencing young people's conceptions of environment. *Environmental Education Research*, *9*, 3–19.

Mackey, G. (2012). To know, to decide, to act: The young child's right to participate in action for the environment. *Environmental Education Research*, *18*, 473–484.

Mackintosh, M. (2005). Children's understanding of rivers. *International Research in Geographical and Environmental Education*, *14*, 316–322.

Madden, L., & Liang, J. (2017). Young children's ideas about environment: Perspectives from three early childhood educational settings. *Environmental Education Research*, *23*, 1055–1071.

Matthies, E., Selge, S., & Klöckner, C. A. (2012). The role of parental behaviour for the development of behaviour specific environmental norms – The example of recycling and re-use behavior. *Journal of Environmental Psychology*, *32*, 277–284.

Melson, G. (2013). Children's ideas about the moral standing and social welfare of non-human species. *The Journal of Sociology & Social Welfare*, *40*, 81–106.

Ministry of Education and Science of the Republic of Lithuania (2017). Pradinio ugdymo bendroji programa [General Program of Primary Education]. Retrieved from http://www.smm.lt/uploads/documents/Svietimas_pradinis_ugdymas/1_pradinio%20ugdymo%20bendroji%20programa.pdf.

Österlind, K., & Halldén, O. (2007). Linking theory to practice: A case study of pupils' course work on freshwater pollution. *International Research in Geographical and Environmental Education*, *16*, 73–89.

Palmer, J. A., & Suggate, J. (2004). The development of children's understanding of distant places and environmental issues: Report of a UK longitudinal study of the development of ideas between the ages of 4 and 10 years. *Research Papers in Education*, *19*, 205–237.

Piaget, J. (1981). *The psychology of intelligence*. Totowa, NJ: Littlefield, Adams & Co.

Pike, S. (2011). 'If you went out it would stick': Irish children's learning in their local environments. *International Research in Geographical and Environmental Education*, *20*, 139–159.
Rickinson, M. (2001). Learners and learning in environmental education: A critical review of the evidence. *Environmental Education Research*, *7*, 207–320.
Schreier, M. (2012). *Qualitative content analysis in practice*. Los Angeles: SAGE.
Wylie, J., Sheehy, N., McGuinness, C., & Gerry, O. (1998). Children's thinking about air pollution: A systems theory analysis. *Environmental Education Research*, *4*, 117–137.