Chapter #14

DEVELOPMENT OF ENVIRONMENTAL MORAL JUDGMENT WITH SPECIFIC TEACHING ON SUSTAINABLE DEVELOPMENT

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ABSTRACT
Research on the development of environmental moral judgment in children has been conducted in recent years (Hansla, Gamble, Juliusson, & Gärling, 2008; Persson, Sahlin, & Wallin, 2015). Kahn and colleagues (Kahn & Lourenço, 2002; Kahn & Peter, 2003; Kahn, Saunders, Severson., Myers & Gill, 2008) made an important contribution by identifying three types of environmental moral reasoning: homocentric, biocentric and isomorphic. Our study studies the influence of sustainable development education on the environmental moral reasoning of 1st and 2nd grade students. Our main hypothesis suggests that students exposed to specific education will have a bio-centered moral reasoning in relation to their peers. In this study, 116 participants were divided into two groups: one receiving a specific education on sustainable development (n = 60) and the other without teaching (n = 56). To assess the moral reasoning of children, we designed scenarios incorporating environmental elements. The student's T-tests revealed a predominant tendency to bio-centered reasoning among all participants. Children who did not receive targeted education found it very difficult to formulate moral judgments and reasoned responses to scenarios. These results highlight the crucial role of environmental education in providing additional cognitive tools essential to the development of their reasoning abilities.

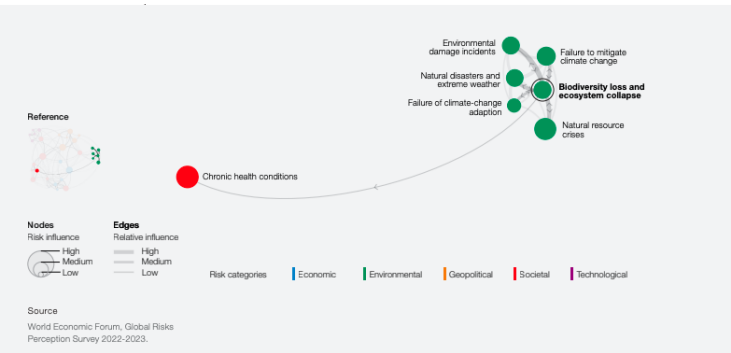
Keywords: elementary school children, sustainable development education, environmental moral development, environmental moral judgment, reasoning.

1. INTRODUCTION

According to the 2023 World Risk Report, environmental risks top the list of threats to human systems, as depicted in Graphic 1. Given the ongoing triple environmental crises involving climate change, biodiversity loss, and contamination, active engagement from all stakeholders has become crucial for steering human systems towards sustainable development. In this transformative process, children can play a pivotal role. The literature underscores the pressing need to incorporate sustainable development education into primary school curricula. This integration is essential to equip the younger generation with the knowledge and skills necessary to adopt environmentally responsible practices, contribute to a sustainable future, and foster a personal sense of moral responsibility.

In several countries, including France, governments have proposed the introduction of environmental education for primary school children. The aim is to enhance their understanding of environmental issues and promote environmentally respectful behavior. It's worth noting that children's environmental moral development is indirectly but significantly connected to this goal, as the installation of moral values during childhood can have lifelong effects.

Graphic 1.
The Most Pressing Environmental Risks, The Global Risk Report 18th Edition, 2023 (https://www3.weforum.org/docs/WEF_Global_Risks_Report_2023.pdf).



1.1. Environmental Moral

Environmental moral is the systematic application of judgment and reasoning in consideration of the right, liberties, justice, equality and respect for the biophysical components of the environment (Kopnina, 2014). Similar to the general moral development, children gradually learn to differentiate between what is morally right and wrong, adapting their behaviors based on their involving moral judgment. The development of environmental moral encompasses all facets of human development, including cognition, emotion, behavior and social interactions. Cognitive aspects are the focus of this study.

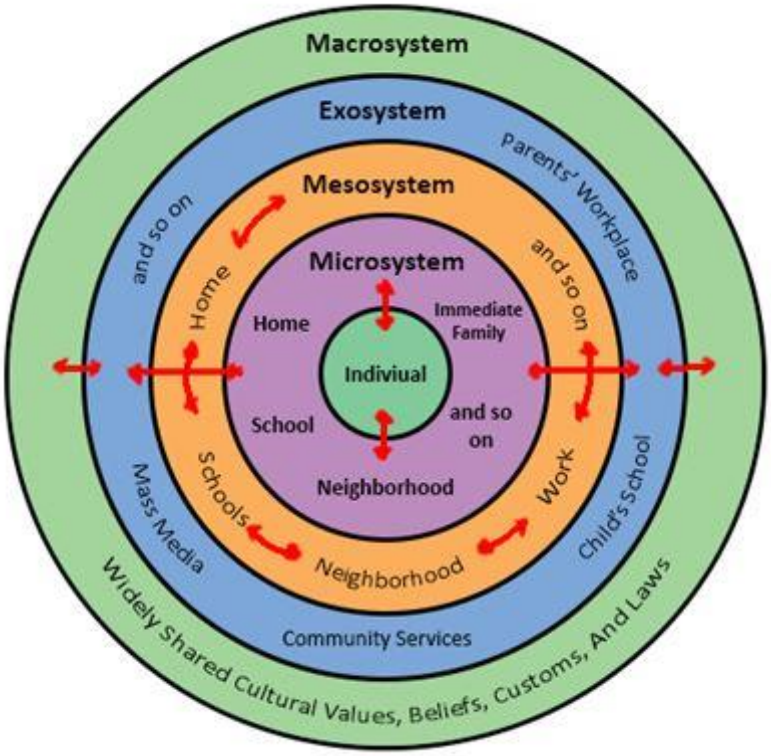
1.2. Ecological System Theory Approach to Environmental Moral Development

Bronfenbrenner's Ecological Systems Theory (1979) provides a robust framework for understanding the educational influences on cognitive development, especially within the context of moral environmental reasoning (refer to Figure 1). In the case of school-aged children, the microsystem, which comprises the home, family, school, and neighborhood, holds particular significance. However, Bronfenbrenner's model highlights the interplay between all systems and how they influence the components of the microsystem. For instance, factors from the exosystem, such as mass media, and broader shared values, norms, or ideologies within the macrosystem, also play a role.

This model has found extensive application in educational literature, as demonstrated by recent studies (e.g., Feriver, Olgan, Teksoz & Barth, 2022; Hayes, O'toole & Halpenny, 2022; Mulisa, 2019). While this study primarily focuses on the influence of school education on the development of moral environmental reasoning, we acknowledge that education for sustainable development is intricately connected to various components of other systems.

Children who have the opportunity to interact with the natural world, often alongside educators, tend to develop behavioral patterns and emotional responses closely linked to their experiences in natural environments. When presented with environmental situations, these children activate their cognitive schemas developed through these experiences. Consequently, educators, particularly teachers, play a pivotal role in promoting environmental education. Recognizing the importance of environmental education, UNESCO has taken proactive measures by establishing a working group dedicated to teacher training. This initiative has resulted in the development of a set of 'good practices' aimed at facilitating the teaching of sustainable development concepts to children. (https://unesdoc.unesco.org/ark:/48223/pf0000217413).

Figure 1.
Representation of Bronfenbrenner's ecosystemic model.
Source of the image: https://cormac404.wordpress.com/2017/05/18/some-thoughts-on-an-ecological-perspective-of-social-media-research/



Several authors agree that education is crucial for sustainable development and that child-centered approaches should be used to develop attitudes and values for sustainability from an early age. In the ecosystemic approach teachers must provide support to children so that they can become creators of their knowledge (Bascopé, Perasso & Reiss, 2019; Campbell, & Speldewinde, 2022; Pahnke, O'donnell & Bascope 2019). Environmental education is viewed as a tool to address environmental issues and link environmental education with children's pro-environmental behavior (Otto & Pensini, 2017).

1.3. Environmental Moral Development

Children exhibit also innate predispositions, such as pro-social behaviors emerging as early as six months of age (Hamlin & Van De Vondervoort , 2018). They demonstrate sensitivity to the socio-moral dimensions of interactions, allowing them to distinguish between positive and negative actions. Environmental issues are often perceived as complex social dilemmas (Kopnina, 2014), involving intricate moral considerations. The inherent value of all living beings underscores the need for ethical regard.

Numerous researchers have embarked on investigations into the developmental trajectory of moral environmental judgment in children (Hansla et al., 2008; Persson et al., 2015). Notably, Kahn and colleagues (Kahn & Friedman, 1995; Kahn & Lourenço, 2002; Kahn & Peter, 2003; Kahn, 2006; Kahn et al., 2008; Kahn, Severson, & Ruckert, 2009) have pioneered the exploration of environmental moral reasoning in children. For them, reasoning underlies judgment, encompassing three distinct types. Firstly, homocentric reasoning posits that humans may exploit the environment for their interests and well-being, both physically and psychologically. Secondly, bio-centric reasoning proposes that the environment holds a moral status, emphasizing a relationship between nature and care. The third type, isomorphic thinking, highlights the moral equivalency between humans and nature, as reflected in the question, 'Why should animals be killed when they possess rights akin to our own?' (Kahn & Friedman, 1995). This demonstrates how children link the rights of animals with those of humans. The importance of recognizing the moral worth of nature is highlighted by Hahn and Garrett (2017), as it establishes an ethical obligation to safeguard the environment. The presence of environmental morality, particularly in the context of assessments of human responsibility for pollution, and biodiversity loss has also been documented in schoolchildren (Gutierrez & Lammel, 2016).

The study's objectives involve examining the influence of education on children's environmental moral development. More precisely, we aim to evaluate how education, positioned within the microsystem of Bronfenbrenner's eco-systemic framework, affects moral environmental reasoning, recognized as "universal" model by Kahn et al. (Kahn & Friedman, 1995; Kahn & Lourenço, 2002; Kahn & Peter, 2003; Kahn, 2006; Kahn et al., 2008; Kahn et al., 2009). To accomplish this, we have chosen two schools within the same urban environment as the research setting. In the first school, students receive dedicated instruction on sustainable development, while in the second school, students do not have access to such specialized education.

2. METHODOLOGY

2.1. Population

In the study, we conducted interviews with a total of 116 child participants. Their ages ranged from 6 years to 8 years (M = 6 years and 6 months, SD = 0.28). The sample was evenly distributed, consisting of 58 girls and 58 boys.

Fifty-six of the children were in the first and second grades and attended schools that did not provide specific instruction on sustainable development. The remaining 60 children, also in the first and second grades, received dedicated teaching on sustainable development. All participants were raised in the Parisian suburbs, which served as the location for our experiments. The socio-economic status of their parents was consistent with the overall socio-economic status of the country.

2.2. Material

To access the children's knowledge and judgments on sustainable development, seven stories were presented to them, including four main topics, such as the destruction of nature, behavior towards animals, pollution, and selective recycling. This was a stimulating and innovative tool for accessing children's knowledge and judgments, and the material was challenging and innovative. Sustainability was never explicitly mentioned in the stories.

2.3. Procedure

Prior to the interviews with children, teachers were asked about the content of their teaching. The experiment was divided into two stages. First, the first researcher read the different stories and then asked the child to judge them. The researcher then conducted a semi-structured interview asking the child to explain his answer. The experiment was carried out individually and the average interview time was 13.5 minutes per child.

2.4. Data Coding

The children's responses were categorized into distinct response groups, employing criteria akin to those defined by Kahn & Lourenço (2002). The categorization process was carried out by impartial judges, demonstrating a high level of agreement (Kappa coefficient: 0.97).

2.5. Results: Teachers Responses

In this study, students under the guidance of an external lecturer for sustainable development and those without a specific teacher participated in different educational activities.

External lecturer: For 1st-grade students, the topics covered included the living world, animal growth, and various ecosystems, meanwhile, 2nd-grade students focused on the living world and life cycles. The classroom organization was divided into two phases: one for theoretical reflection and another in which students actively engaged in maintaining the school vegetable garden and breeding turtles on the school premises.

For students without an external lecturer, the grade-level teacher conducted the lessons. 1st-grade students observed the trees in the school garden, while 2nd-grade students explored some characteristics of animal life cycles.

2.6. Results: Individual Interviews with Children

Four response categories were delineated during the initial phase of the analysis: bio-centric, homocentric, isomorphic, and "I don't know" (see the examples in Table 1, and the percentages in table 2).

In the second phase, we employed statistical analyses of Student's t-tests, to assess the influence of teaching on the choice of reasoning employed. The results of these analyses did not identify any significant differences between the two groups of children. However, the analysis of the "I don't know" response revealed a significant negative difference for the 1st graders $t\ (-1.842)$, $p < .05$, and a significant positive difference for the 2nd graders $t\ (3.053)$, $p < .05$.

Table 1.
Examples of responses.

Reasoning	1st grade without teaching	1st grade with teaching	2nd grade without teaching	2nd grade with teaching
Bio-centric	It destroys nature, plants give us air.	Because it's not right to kill nature.	It's not good because it pollutes the earth and the earth will be sick after.	Because you don't have to destroy the forests to make money. Nature is more important.
Homocentric	Because at least you can see the animals.	Because after people, they have no food.	Because at least there will be more room for people.	That's good, it can be useful.
Isomorphic	Because the fish need to live and have water and to be able to breathe. Then for fishermen it is necessary to keep them to eat them.	So he's not all wet. But if he goes on foot, he could take an umbrella.	I'm saying if it's a car that's not electric, it doesn't do nature any good. It's not good for nature even if for us it's better	Maybe they felt better in their country than in the zoo. Even if people come to see them

Table 2.
Percentages of children's responses.

Reasoning	1st grade, without teaching	1st grade, with teaching	2nd grade, without teaching	2nd grade, with teaching
Bio-centric	36.51	53.92	45.32	54.19
Homocentric	27.51	30.88	31.53	28.08
Isomorphic	10.58	7.83	12.32	14.78
I don't know	25.40	7.37	10.84	2.96

3. DISCUSSION

Results show that the two groups of children essentially used bio-centric, pro-environmental reasoning, confirming the hypothesis of Kahn and his collaborators (Kahn & Lourenço, 2002; Kahn & Peter, 2003; Kahn et al., 2008). The children's responses have a link with liberty, justice, equality and respects.

However, the frequent occurrence of "I don't know" in children without specific teaching, suggests that children who did not receive specific environmental education lacked access to the narrative representation and a fundamental understanding of environmental issues. The results regarding the response 'I don't know' must be taken into consideration, as they indicate the necessity for environmental education to impart the knowledge required for fostering pro-environmental values. Initiating environmental education from a young age is crucial. The development of environmental morality is contingent on the knowledge that specialized education can impart. On the eco-systemic approach of human development (Bronfenbrenner, 1979) schools play a pivotal role in shaping the moral environmental development of children, enabling them to make moral judgments more easily and apply the knowledge they acquire.

Consequently, it becomes increasingly important to comprehend the various dimensions of environmental awareness, as highlighted by Otto and colleague (2017). This underscores that nature is imbued with moral value, and the acquisition of knowledge takes precedence in addressing future environmental challenges (Hahn & Garrett, 2017).

This study's findings indicate that children have an inherent predisposition toward environmental ethics, but education can further reinforce and enhance this inclination.

4. CONCLUSION ANS PERSPECTIVES

This study's findings suggest that children possess an inherent predisposition toward environmental ethics, which can be further reinforced and enhanced through education. Environmental education, whether delivered through traditional or outdoor learning within their developmental microsystem, is of paramount importance.

Between the ages of six and eight, a critical developmental phase emerges, marked by an increased receptivity to knowledge acquisition, enabling the formulation of judgments regarding environmental behaviors and attitudes. In conclusion, educational approaches should prioritize placing the child at the center, recognizing them as citizens with rights.

Emphasizing children's interactions can help cultivate notions of equity and justice, which are essential for the preservation of common goods like water, soil, forests, and biodiversity (Bascope, Perasso, & Reiss, 2019; Campbell & Speldewinde, 2022; Pahnke, 2019; Gutierrez & Lammel, 2016). Teachers play a pivotal role in shaping children's experiences by transmitting knowledge related to the environment. To nurture a biocentric perspective, it is imperative to strengthen environmental education, not only through classroom instruction but also through direct experiences.

Future research in this field should explore cross-cultural perspectives and incorporate longitudinal studies with international collaboration. Additionally, efforts to enhance teacher training in sustainable development can be instrumental in equipping children with scientific knowledge and specific skills from an early age.

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ACKNOWLEDGEMENTS

We would like to express my gratitude to the schools and teachers for their contributions to this research and thank the schoolchildren for their dedicated and meticulous completion of the exercises.

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