

Emotional ecology and educational inequalities: a pedagogical proposal for a sustainable transition

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Abstract: In response to current environmental and social challenges, pedagogy is urged to redefine its role in fostering sustainable and inclusive futures. Within UNESCO's Education for Sustainable Development (ESD) framework, ecological awareness is conceived as a multidimensional process involving affective, ethical, and identity aspects of the human-nature relationship (Sterling, 2021; Bonnett, 2022). This study contributes to the debate on emotional ecology (Finestrone, Savino & di Furia, 2023), understood as the affective and identity-based connection with nature—a pedagogical lever to counteract ecological educational inequalities (Bruno, 2020; D'Alessio, 2021; D'Aprile & Bufalino, 2024), namely disparities in environmental access and awareness across socio-cultural contexts. A quantitative design employs the Revised Emotional Identification with the Environment (Revised EID) Scale (Ariccio & Mosca, 2023; $\alpha > .80$) to operationalise two dimensions: (1) emotional connection with nature—attachment, belonging, and place identity; and (2) intentionality to protect nature—motivations for pro-environmental behaviours. The independent variable, environmental context of residence (urban, peri-urban, rural), acts as a proxy for exposure to natural settings. The study explores how environmental exposure shapes ecological connection profiles among adolescents and young adults. Findings aim to inform educational strategies—outdoor learning, reflective practices, and compensatory actions—promoting environmental justice through affective, context-sensitive pedagogies that nurture genuine care for the natural world.

Keywords: connection with nature; education; sustainability; connessione con la natura; didattica; sostenibilità.



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¹ Francesca Finestrone is the main researcher of the project. She wrote the Abstract and Paragraph 3, “An Exploratory Study on Environmental Identity among Adolescents: Connections, Protection, and Contextual Differences”; Marco di Furia wrote Paragraph 2, “‘Green’ Well-Being: Educational Values and Impacts of the Nature Experience”; Francesco Pio Savino wrote Paragraph 4, “Conclusions”; Alice Rizzi wrote Paragraph 1, “Introduction”; Pierpaolo Limone supervised and revised the entire article.

1. Introduction

In recent years, Outdoor Education has emerged as a privileged framework for integrating well-being, learning, and ecological citizenship, offering schools a real-world laboratory in which to experiment with educational practices capable of connecting disciplinary knowledge with lived experience. Free and non-discriminatory access to spaces-especially natural ones-is a prerequisite for fair and inclusive education, as well as a condition for making the right to education effective in all its dimensions: cognitive, emotional, social, and civic. Today, the ecological transition directly challenges pedagogical constructs, calling on them to combine environmental justice, well-being, and educational inclusion. Within UNESCO's Education for Sustainable Development (ESD) framework, there is growing recognition that ecological literacy cannot be limited to the transmission of knowledge, but must integrate the affective, ethical, and identity dimensions of the person-nature relationship (Sterling, 2021; Bonnett, 2022). This orientation is consistent with the Sustainable Development Goals of the 2030 Agenda, which call on schools to play a transformative role: in particular SDG 4 (4.7 on education for sustainability), SDG 3 (health and well-being), SDG 11 (sustainable cities and communities), SDG 13 (climate action), and SDGs 14–15 (life below water and on land). In the European context, the Paris Declaration (2015) on citizenship and the inclusive dimension of education, the Council Recommendation on learning for environmental sustainability (2022), and European guidelines on sustainable schools and outdoor learning consolidate the need for experiential, accessible, and context-sensitive curricula. In Italy, documents such as the Guidelines for Civic Education (Law 92/2019) and Schools' Ecological Transition Plans (PTeS) guide schools toward integrated pathways that include nature, citizenship, and well-being. From this perspective, Outdoor Education offers a privileged framework: it transforms natural spaces into relational learning environments capable of supporting processes of meaning-making, belonging, and responsibility. In parallel, the concept of emotional ecology-understood as an affective and identity-based connection with the natural world (Finestrone, Savino & di Furia, 2023)-emerges as a pedagogical lever to counter ecological educational inequalities, namely those territorial and sociocultural differences in access to, familiarity with, and awareness of the environment that, over time, shape values, attitudes, and behaviors. This contribution lies at the intersection of "green" well-being, environmental identity, and educational justice. In the first part, we synthesize evidence attributing to nature-based experiences positive effects on self-esteem, positive affect, stress reduction, social competences, and resilience in developmental age (Roberts, Hinds & Camic, 2020), distinguishing between interventions situated in extra-ordinary contexts (Pirchio et al., 2021) and intensive school programs (McAnally, Robertson & Hancox, 2018). The findings suggest that contact with nature alone does not guarantee favorable outcomes for well-being: the quality of pedagogical mediation and universal accessibility are decisive conditions. For this reason, we draw on Sugerman's (2001) operational model, which calls for mapping resources and attitudes, identifying specific needs, and implementing facilitation strategies and adaptations-linguistic, instrumental, evaluative, and environmental-to make Outdoor Education truly inclusive. In the second part, we present an exploratory study on environmental identity in adolescence, using the Revised Environmental Identity Scale (Clayton, 2003; Italian adaptation Ariccio, 2023). The data show high scores in the dimensions of connection and protection and a strong correlation between them ($r =$

.835, $p < .01$), indicating that the emotional bond with nature is associated with the motivation to protect it. Noteworthy, and only apparently counterintuitive, is the average advantage of urban students over their rural peers: a possible “normalization” of nature in high-exposure contexts, combined with the mediating role of schools and public discourse on sustainability, may explain this pattern (Hinds & Sparks, 2008; Collado & Corraliza, 2015). The qualitative analyses confirm a strongly vegetal imaginary (the tree as archetype), landscape-oriented and symbolic–existential (freedom, silence, tranquility), but also point to the need for a more robust systemic understanding. Overall, we propose an integrated reading: when designed to be accessible and reflective, Outdoor Education can support psychophysical well-being while nurturing action-oriented ecological identities. Concrete curricular implications follow: treating nature as a central and relational element of teaching activities; embedding reflective and narrative practices that connect experience and responsibility; implementing compensatory strategies in contexts with limited access to green spaces (school gardens, green corridors, virtual immersions). In this sense, we adopt a situated pedagogical perspective: nature is not merely a scenic backdrop but a relational and political learning environment in which meanings are negotiated, bonds are built, and democratic competences are exercised. Consequently, the educational task is not only to offer opportunities for contact with green spaces, but to create conditions that make such opportunities equitable, intentional, and transformative. Understood in this way, Outdoor Education becomes a device for linking well-being and sustainability, experience and reflection, inclusion and environmental justice, guiding educational institutions toward designs capable of integrating access, pedagogical quality, and formative impact.

2. ‘Green’ Well-Being: Educational Values and Impacts of the Nature Experience

Access to and free enjoyment of spaces is an essential prerequisite for building an educational framework that is truly fair and inclusive. This is even more true when referring to outdoor spaces—such as parks, forests, and other places where the connection with the natural environment is stronger. Educational experiences in nature can have beneficial effects, as demonstrated by several studies conducted on populations of children and adolescents (Roberts, Hinds & Camic, 2020). In the systematic review by Roberts and colleagues (2020), in particular, positive impacts were highlighted on self-esteem and confidence, positive affect, stress reduction and restoration, as well as social benefits and resilience. Educational activities in nature can take place in settings outside the familiar environment, as in the studies analyzed by Pirchio et al. (2021), or serve as a central and foundational element of full-fledged school programs, such as the Tihoi Venture School described by McAnally, Robertson & Hancox (2018). In particular, the spontaneous nature experiences reported by Pirchio and colleagues took place in a natural reserve in Italy’s Lazio region; during these occasions, as students became more closely connected to nature, their levels of pro-environmental attitudes, psycho-physical well-being, and prosocial behaviors increased significantly. Conversely, a school program based on outdoor activities combined with reduced exposure to the Internet and digital media does not appear to be associated with significant increases in students’ perceived well-being (McAnally, Robertson & Hancox, 2018). Outdoor education does not only have the merit of positively impacting well-being: Abdullah, Zakaria & Razman (2018) highlight its

value in promoting environmental education among school-aged students, since outdoor experiences transform nature into a learning space; Zafeiroudi's (2020) study, conducted on adolescents aged 13 to 17, explores the interconnection between outdoor educational experiences and environmental awareness, finding an unequivocal link with environmentalist attitudes and values; more recently, Mallette and colleagues (2025) emphasized that educating in nature reinforces the idea of the natural space as something to be preserved as well as exploited, generally contributing to shaping perceptions toward nature; in other words, environmental sensitivity is strengthened by proximity to the environment itself. Outdoor education is therefore a pedagogical resource of high value, and an opportunity. Not only for educating toward environmental sustainability, but also for positively influencing certain dimensions of psycho-physical well-being; for this reason, ensuring its full accessibility should be among the aims of pedagogical practice. In the model proposed by Sugerman (2001), before implementing any outdoor education program, after identifying resources (step 1) and participants' attitudes (step 2), it is necessary to gather specific information on the user's needs (step 3) and develop facilitation strategies (step 4). Adaptations begin with language, which must be respectful and free from discriminatory or ableist connotations, and continue with the use of alternative or supportive equipment, the adjustment of the skills to be assessed, and even modifications of the environment.

3. An exploratory study on environmental identity among adolescents: connections, protection, and contextual differences

3.1. Objectives

A study was conducted to explore the levels of environmental identity among high school students, understood as both a sense of connection with nature and the propensity to protect it. The Revised Environmental Identity Scale, Italian version by Ariccio, was administered to verify its applicability in a school-based sample and to examine the relationship between the two main dimensions of the scale. In addition, the analysis investigated whether the living context (urban or rural) influenced the students' scores. The ultimate aim was to contribute to the ongoing scientific debate on environmental education during adolescence, a critical stage in identity construction, and to provide insights useful for designing educational pathways that strengthen ecological awareness and civic responsibility.

3.2. Sample description

The sample consisted of 29 students from different high school tracks: 3.4% attended a lyceum, 37.9% a technical institute, and 58.6% a vocational school. With regard to living context, 55.2% came from rural areas and 44.8% from urban areas. Data collection took place in classrooms, in group settings, with anonymity guaranteed. Statistical analyses were carried out with SPSS and included descriptive statistics (means and standard deviations), Pearson's correlations between the subscales, and independent-samples t-tests comparing rural and urban students.

3.3. Results

Descriptive analyses showed relatively high scores on both dimensions. The connection subscale reported a mean of 4.88 (SD = 1.055), while the protection subscale had a mean of 4.72 (SD = 1.431). Pearson's correlation between the two dimensions was strong and positive, $r = .835$, $p < .01$, indicating a significant relationship between feeling connected to nature and being motivated to protect it. The analysis by living context highlighted significant differences. Rural students reported a mean of 4.47 (SD = 1.015) for connection and 4.47 (SD = 1.678) for protection. Urban students, by contrast, obtained higher mean scores: 5.38 (SD = 0.895) for connection and 5.03 (SD = 1.036) for protection.

Table 1. Descriptive statistics for environmental identity dimensions.

Dimension	M	SD	N
Connection	4.88	1.055	29
Protection	4.72	1.431	29

Table 2. Correlation Between Environmental Identity Dimensions. $p < .01$ (two-tailed)

Variables	Connection	Protection
Connection	-	.835**
Protection	.835**	-

Table 3. Group statistics by living context

Dimension	Context	N	M	SD	SE
Connection	Rural	16	4.47	1.015	0.254
	Urban	13	5.38	0.895	0.248
Protection	Rural	16	4.47	1.678	0.419
	Urban	13	5.03	1.036	0.287

In addition to the quantitative findings, a qualitative analysis was conducted on students' spontaneous representations of nature, based on the open prompt "Write

the first three images or elements that immediately come to mind when thinking about Nature.” Responses evoked a wide spectrum of images, ranging from concrete natural elements to more abstract and symbolic associations. Vegetal elements were predominant, with frequent references to “trees,” “leaves,” “bushes,” “flowers,” and “meadows.” Among these, the tree emerged as a central archetype, symbolizing life, stability, and continuity. Participants also frequently mentioned landscapes and natural settings such as “sea,” “mountains,” “hills,” and “countryside.” Nature was thus envisioned primarily as a broad, immersive scenario, often associated with vastness and openness. Less frequent, though still present, were references to the animal world, including “animals” and “small animals.” The relatively low frequency of these mentions may reflect limited everyday contact with wildlife, particularly for urban students. A further layer of responses revealed the emotional and existential meanings attributed to nature. Terms such as “freedom,” “beauty,” “silence,” and “tranquility” indicated that students internalized nature as a symbolic space, associated with psychological well-being and peace of mind. Finally, some students offered abstract or conceptual references, such as “ecology,” “life,” and “planet,” suggesting the emergence of a systemic and global perspective in a minority of cases.

3.4. Discussion

The quantitative results confirmed the validity of the scale, highlighting strong internal consistency between the two dimensions. A noteworthy finding concerned the effect of living context: urban students reported significantly higher scores than their rural peers. Although this may seem counterintuitive, previous studies have shown that daily exposure to natural environments does not necessarily result in stronger environmental connection or protective attitudes. On the contrary, such exposure may normalize nature to the point of reducing its emotional salience (Hinds & Sparks, 2008). Urban students, while less immersed in nature, are often more exposed to public discourses, school programs, and initiatives focused on sustainability, which may enhance their environmental awareness (Collado & Corraliza, 2015). This evidence emphasizes the role of schools as mediators in the construction of environmental identity. Adolescence is a critical phase in which educational experiences can consolidate the perception of oneself as part of nature and foster the motivation to defend it (Clayton et al., 2021). School activities that combine direct experiences with nature, critical reflection, and concrete opportunities for action can reduce the well-known “attitude–behavior gap,” ensuring that attitudes are more consistently translated into sustainable behaviors. The qualitative findings further enrich this interpretation by shedding light on the symbolic and emotional imagery that students associate with nature. The predominance of trees and other vegetal elements reflects the role of stable archetypes in environmental representation, with trees in particular evoking continuity, stability, and life (Kellert, 2018; Wilson, 2021). Frequent references to landscapes such as the sea, mountains, and countryside confirm that nature is imagined as a vast experiential horizon, associated with openness, freedom, and restoration (Kaplan & Kaplan, 1989; Hartig et al., 2014). Beyond concrete images, students also described nature in emotional and existential terms, using words such as “freedom,” “beauty,” “silence,” and “tranquility.” These responses indicate that the natural environment is not only perceived externally but also interiorized as an identity-shaping and

meaning-producing experience. Although less common, the appearance of abstract ecological concepts such as “ecology” and “planet” is particularly noteworthy. These references suggest that some students are beginning to construct a more systemic and critical ecological outlook, pointing to the emergence of an ecological literacy that transcends affective imagery and situates nature within a global, interconnected framework (Bonnett, 2022). Taken together, the quantitative and qualitative results reveal a dual dimension of environmental identity: on one side, an affective and experiential bond with natural elements and landscapes; on the other, a symbolic-existential relationship that attributes meaning and well-being to nature. What emerges less strongly is a consolidated systemic understanding. This gap underscores the educational responsibility to foster not only emotional connection but also critical ecological reflection. Without this, there is a risk that affective attachment remains aesthetic and emotional, without fully evolving into responsible and protective environmental behaviors (Sterling, 2021; Chawla, 2020).

3.5. Limitations and future directions

The small sample size ($N = 29$) represents a limitation to the generalizability of the findings. The unbalanced distribution across school tracks and the focus on a single territorial context further restrict external validity. The exclusive use of self-report measures may have introduced social desirability bias, while the cross-sectional design prevents causal inferences. Future research should enlarge the sample and include diverse geographical areas in order to examine territorial differences more robustly. Qualitative measures (e.g., interviews, focus groups) and behavioral observations would be valuable additions, as would longitudinal designs that could track the development of environmental identity over time. Finally, educational interventions in both urban and rural contexts should be accompanied by pre- and post-test evaluations to assess whether, and to what extent, such experiences strengthen environmental connection and protection.

4. Conclusions

The present study, using the Revised Environmental Identity (Revised EID) Scale, underlines the importance of emotional ecology in understanding how ecological identity develops during adolescence and young adulthood (Ariccio & Mosca, 2023; Clayton, 2003). The data, especially the strong correlation found between the “connection” and “protection” dimensions ($r = .835$, $p < .01$), suggest that feeling emotionally attached to natural elements is closely linked with the motivation to protect them. This is consistent with what other research on environmental identity has already shown (Clayton, 2003; Chawla, 2020). At the same time, the comparison between students from different living contexts showed an interesting and somewhat unexpected result: urban students reported higher average scores than those from rural areas. This seems to indicate that simply being surrounded by nature on a daily basis does not automatically make it more emotionally significant. Processes of “normalization” and, above all, the role of schools and educational settings as mediators of environmental sensitivity may therefore be decisive (Hinds & Sparks, 2008; Collado & Corraliza, 2015). The qualitative data reinforce this view. Students often mentioned trees and other plant elements, as well as words such as “silence,” “tran-

quility,” and “beauty,” which point to the symbolic and restorative meanings attributed to nature (Kaplan & Kaplan, 1989; Hartig et al., 2014; Kellert, 2018). From an educational perspective, the findings stress the need for integrated strategies that combine direct experiences in natural environments with reflective and narrative practices, as well as opportunities for concrete action. Well-designed outdoor interventions can promote both well-being and pro-environmental attitudes (Roberts et al., 2020; Pirchio et al., 2021; Mallette et al., 2025). However, exposure to nature alone does not necessarily increase well-being or sustainable behavior (McAnally et al., 2018). For this reason, compensatory measures in contexts with limited access to nature—such as school gardens, virtual experiences, or green corridors—are recommended, along with educational pathways that link emotion, critical knowledge, and opportunities for participation (Bruno, 2020; D’Alessio, 2021; D’Aprile & Bufalino, 2024).

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