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Adult Perspectives on the Antecedents and Drivers of Children's Pro-Environmental Behavior: A Qualitative Content Analysis

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A B S T R A C T

Purpose: This study aimed to explore adults' perspectives on the antecedents, mechanisms, and contextual drivers contributing to the development and promotion of children's pro-environmental behaviors within parent–child and broader social contexts.
Methods and Materials: This qualitative study was conducted within an interpretive-constructivist paradigm using a phenomenological and inductive approach. Participants were 12 parents, environmental advocates, and educational psychologists selected through purposive sampling based on relevant personal or professional experience. Sampling continued until data saturation was achieved. Data were collected through semi-structured, in-depth interviews conducted between May 2025 and February 2026, with interviews lasting approximately 45–70 minutes. Interviews were transcribed verbatim and analyzed inductively using thematic analysis in MAXQDA 2024. Trustworthiness was established through credibility, transferability, dependability, and confirmability procedures, including member checking, independent recoding, contextual description, and expert review.
Findings: The thematic analysis generated six main themes and 16 subthemes. The findings showed that children's pro-environmental behavior develops through the interaction of environmental, psychological, familial, educational, and societal influences. Contact with nature enhanced emotional well-being, parent–child relationships, cognitive development, and environmental sensitivity. Parental knowledge, attitudes, responsibility, behavioral consistency, and family environmental culture emerged as central determinants. Observational learning, parent–child communication, experiential participation, and modeling facilitated the transmission of environmental behaviors. Early exposure to nature and sustained value transmission contributed to the internalization of environmental values and formation of environmental identity. Educational, motivational, and empowerment strategies further reinforced environmentally responsible behavior, while environmental upbringing produced enduring cognitive, ethical, behavioral, and developmental outcomes.
Conclusion: Children's pro-environmental behavior is a multidimensional and reciprocal developmental process shaped by interconnected family, educational, psychological, and societal mechanisms; therefore, coordinated interventions involving parents, schools, communities, and policymakers are essential for fostering durable environmental identity and sustainable behavior from childhood.
Keywords: *Adult Perspectives; Children's Pro-Environmental Behavior; Parent–Child Interaction; Environmental Identity; Environmental Education.*

1. Introduction

Environmental degradation has become one of the defining challenges of contemporary societies, with climate change, biodiversity loss, resource depletion, pollution, and unsustainable consumption patterns increasingly affecting ecological systems and human well-being. Addressing these problems requires not only technological innovation and regulatory intervention but also sustained behavioral change at the individual, family, institutional, and community levels. Pro-environmental behavior refers broadly to actions intended to minimize harm to the natural environment or actively contribute to environmental protection, including conserving water and energy, reducing waste, recycling, avoiding unnecessary consumption, protecting biodiversity, and participating in environmental initiatives. Because behavioral patterns and value orientations begin developing early in life, childhood represents a particularly important developmental period for cultivating environmental responsibility. Recent research has consequently emphasized the importance of introducing environmental knowledge, values, and practices during the school years and integrating these efforts across educational and socialization contexts (Bottin et al., 2026; Đorđević et al., 2026; Li et al., 2025). The development of pro-environmental behavior in children, however, cannot be understood as the simple acquisition of factual environmental knowledge. Rather, it reflects an interaction among cognitive understanding, emotional experiences, social relationships, perceived behavioral competence, opportunities for participation, and the cultural meanings attached to nature and sustainability.

Educational research increasingly suggests that environmental learning is most effective when children are actively involved in meaningful, contextually relevant, and participatory experiences. Traditional information-oriented approaches may improve environmental knowledge, but behavioral transformation often requires opportunities for children to observe environmental practices, participate in decision-making, experience the consequences of their actions, and develop a sense of personal efficacy. Project-based and action-oriented learning can strengthen students' environmental values, attitudes, and willingness to engage in responsible behavior because learners become active participants rather than passive recipients of environmental messages (Đorđević et al., 2026; Kalla et al., 2022). Similarly, participatory school-based activities that connect environmental issues with children's local communities may promote environmental citizenship by enabling students to investigate real environmental problems and contribute to collective responses (Silva et al., 2025). Awareness-based interventions have also demonstrated that targeted educational exposure can encourage environmentally responsible habits when knowledge is translated into specific behavioral expectations and practical action (Zafar et al., 2024). These findings underscore the importance of moving beyond abstract environmental instruction toward educational processes that connect knowledge, values, experience, and action.

The school environment is therefore a major context for the formation of children's environmental attitudes and behavior. Teachers, curricula, peer relationships, and the physical characteristics of educational settings can all influence the extent to which sustainability becomes integrated into everyday behavior. Teaching practices that model environmental responsibility and connect classroom learning with real-life ecological concerns have been associated with stronger pro-environmental orientations among elementary students (Díaz et al., 2021). School-based conservation programs can also produce durable effects, as demonstrated by evidence showing long-term improvements in children's conservation knowledge and behavior after sustained environmental education interventions (Chanvin et al., 2023). The presence of green environments may additionally contribute to both educational and environmental outcomes by providing opportunities for direct engagement with nature and by embedding environmental experience within students' routine settings (Tusyanah et al., 2023). Research on zoo and aquarium conservation education further indicates that informal educational environments can support knowledge, attitudes, and conservation-related learning, although learning outcomes vary according to the design and depth of educational engagement (Schilbert & Scheersoi, 2022). More broadly, conservation practitioners have emphasized education as an essential but context-dependent component of conservation practice, particularly when environmental learning is integrated with opportunities for behavioral engagement (Guinart et al., 2022).

Exposure to nature itself may represent an important pathway through which environmental sensitivity and pro-environmental orientations emerge. Nature-based educational experiences provide children with opportunities to develop emotional connection, curiosity, ecological understanding, and a sense of belonging to the natural world. Research on nature education has increasingly recognized

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the importance of experiential approaches that connect children's cognitive development with ecological experience (Li et al., 2025). Nature-based interventions have also been investigated for their broader developmental and psychological benefits, including potential effects on emotional well-being and mental health in school-aged children (Loose et al., 2023; Loose et al., 2024). Such findings suggest that contact with natural environments may simultaneously support children's psychological functioning and create favorable conditions for the development of environmental concern. Even relatively brief psychosocial interventions may influence environmental orientations when they strengthen feelings of connectedness and oneness, as illustrated by evidence linking loving-kindness meditation with changes in affect, social connectedness, and pro-environmental attitudes (Chen et al., 2024). Accordingly, the psychological and emotional dimensions of environmental experience deserve greater attention alongside conventional educational approaches.

The effectiveness of environmental education also depends on developmental appropriateness. Children at different ages vary in cognitive capacity, self-regulation, moral reasoning, social awareness, and ability to understand complex environmental consequences. Among preschool-aged children, metacognition-based approaches have shown promise for promoting environmentally responsible action by helping children think about their own behavior and recognize the environmental implications of everyday choices (Rulli et al., 2024). During adolescence, environmental attitudes become increasingly intertwined with identity, autonomy, social influence, and moral evaluation, highlighting the need for transformative forms of education that address not only knowledge but also values, emotional engagement, and perceived capacity for action (Muñoz-García et al., 2022). Systematic research on middle-school students similarly shows that pro-environmental behavior is influenced by multiple barriers and facilitators, including knowledge, motivation, school culture, family support, and opportunities to act (Isa & Halim, 2023). Low participation in environmental activities among young people may therefore reflect not simply indifference but a combination of psychological, social, institutional, and contextual constraints (Ratriyana, 2023; Razali et al., 2023). Understanding children's environmental behavior consequently requires attention to both internal psychological factors and the environments in which children are expected to act.

Family processes are particularly important because the home is one of the earliest and most enduring contexts of learning and socialization. Parents shape children's development not only through direct instruction but also through behavioral modeling, reinforcement, emotional communication, routines, expectations, and the opportunities they provide for participation. Studies across multiple developmental domains consistently demonstrate that parental involvement can influence children's learning trajectories and behavioral outcomes. For example, the quality of the home literacy environment is associated with children's language and literacy skills, illustrating how repeated family practices can create developmental conditions that extend beyond formal education (Lau & Richards, 2021). Home learning activities and family-based interventions likewise influence school readiness and developmental competence, emphasizing the importance of structured parent–child engagement in shaping children's capacities (Avelar et al., 2023). Parental involvement has also been identified as particularly important for children from socioeconomically disadvantaged backgrounds, where supportive engagement may compensate for limitations in other educational resources (Yang, 2024). Evidence from language-learning interventions further demonstrates that developmental outcomes are shaped by factors such as age, intensity of exposure, and socioeconomic conditions, reinforcing the need to understand family influences within broader structural contexts (Ramírez et al., 2021).

The importance of family engagement is not restricted to conventional academic outcomes. Family-based interventions have been effectively used to influence health, lifestyle, and behavioral practices, suggesting that the household can serve as a powerful site for sustained behavior change. Parent–child educational programs addressing environmental health have demonstrated that coordinated learning between children and caregivers can strengthen awareness and environmental practices within the family (Lee et al., 2025). Similarly, family-based health interventions integrating parenting, nutrition, and literacy demonstrate the feasibility of combining educational content with relational and behavioral processes within everyday family life (Badolato et al., 2026). Sleep health education delivered to children and parents has also shown how family participation can support changes in routines and health-related behavior (Bonuck et al., 2022). More broadly, family-centered interventions for children with specialized health needs emphasize the importance of adapting preventive and educational programs to the capacities,

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routines, and needs of families rather than treating children as isolated intervention recipients (Natale et al., 2024). Evidence from culturally adapted parenting programs likewise shows that parent engagement depends on whether interventions are responsive to families' cultural and contextual realities (So et al., 2020). These findings are highly relevant to environmental behavior because sustainable practices are likewise embedded in repeated family routines and depend on the consistency between communicated values and actual household behavior.

From a social-learning perspective, children observe and interpret the actions of adults around them and gradually acquire norms regarding what behaviors are expected, valued, and meaningful. In the environmental domain, parental modeling may be especially influential because environmentally responsible practices are often expressed through ordinary household behaviors rather than formal instruction. Recycling, avoiding waste, conserving energy, caring for plants and animals, using reusable products, and discussing environmental problems can function as everyday behavioral cues through which children learn what environmental responsibility means. Coordinated school–family environmental education may therefore be particularly effective because it reduces inconsistency between the messages children receive in educational settings and the behaviors they observe at home. Recent work has explicitly emphasized the importance of coordinated environmental education efforts between families and schools for developing an enduring culture of ecological responsibility (Vuong et al., 2026). When school instruction and family practices reinforce each other, environmental knowledge may be more likely to become integrated into children's habits and identities. Conversely, contradictory messages may weaken the credibility of environmental instruction and reduce children's motivation to adopt environmentally responsible behaviors.

Parent–child environmental influence should also be understood as reciprocal rather than exclusively unidirectional. Children increasingly encounter environmental information through schools, digital media, peers, community programs, and environmental campaigns, and they may subsequently introduce this knowledge into the household. Environmental learning can therefore generate a form of reverse socialization in which children influence parental attitudes, routines, and decisions. Child participation in local environmental and climate-related activities also indicates that children can act as environmental citizens with their own perspectives rather than simply as recipients of adult instruction (Rios et al., 2023). This perspective is particularly important because it reframes children as active contributors to household and community environmental behavior. Participatory programs that give children meaningful roles can strengthen agency and create opportunities for intergenerational dialogue. At the same time, effective participation requires supportive educational environments that recognize differences in children's abilities, communication styles, and social backgrounds.

Inclusivity is therefore another important consideration in environmental education. Educational programs cannot assume that all children learn, communicate, or participate in the same way. Research in inclusive education has emphasized the need to adapt learning environments for students with diverse developmental and educational needs (Evans et al., 2021). Studies focusing on deaf and hard-of-hearing students similarly show that curriculum and instruction must be designed to provide equitable access to learning rather than merely applying standard instructional formats to heterogeneous student populations (Hartman et al., 2023). Environmental education may also benefit from approaches responsive to linguistic diversity. Programs addressing marine debris, for example, can capitalize on the strengths of linguistically diverse learners when instruction is designed to recognize rather than suppress differences in language and experience (Hartley et al., 2023). Research on dual-language education and online literacy instruction further illustrates the importance of culturally and linguistically responsive learning environments for young learners (Kim et al., 2022; Li, 2024). These considerations suggest that environmental learning should be viewed within the broader ecology of children's identities, communication patterns, developmental needs, and family cultures.

Cultural context also shapes how parent–child relationships function and how values are expressed within families. Concepts such as emotional connection, responsibility, discipline, autonomy, and communication may differ across cultural and linguistic settings, making culturally sensitive interpretation essential in research on family processes. Work involving the cross-cultural adaptation of measures of mother–child emotional connection demonstrates the importance of attending to linguistic and cultural differences when interpreting relational behavior (Hane et al., 2024). Similar principles apply to environmental socialization, because meanings attached to nature, responsibility, consumption, and appropriate parental guidance are embedded in cultural

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systems. Sustainability knowledge may also be influenced by institutional and cultural environments, as demonstrated in research examining the conditions that support sustainability learning in educational systems (Sabrina Abdullah Aini Arifah binti Abdul, 2021). Consequently, children's pro-environmental behavior should not be understood only in terms of universal psychological variables but also as a socially situated process shaped by cultural expectations and institutional opportunities.

Despite the growing literature on environmental education and pro-environmental behavior, several gaps remain. Much existing research focuses on measuring environmental knowledge, attitudes, intentions, or reported behaviors through quantitative designs. Such studies have generated valuable evidence regarding predictors and intervention effects, but they may provide limited insight into how environmental values are negotiated, modeled, reinforced, resisted, and transformed within everyday family interactions. Recent reviews of climate change and environmental education continue to demonstrate considerable variation in intervention design, outcome measures, and behavioral effects (Bottin et al., 2026). Furthermore, the relationship between knowledge and behavior is rarely linear. Children may understand environmental problems without acting consistently, while families may endorse environmental values but encounter practical, socioeconomic, cultural, or infrastructural barriers to implementing them. Research on young people's low participation and on psychological determinants of environmental behavior reinforces the importance of examining the meanings and contextual conditions underlying apparent behavioral inconsistency (Ratriyana, 2023; Razali et al., 2023). Qualitative inquiry is therefore particularly useful for identifying mechanisms that may be overlooked when complex family processes are reduced to isolated variables.

A qualitative examination of adult perspectives can provide detailed insight into how environmental behavior is perceived to develop across multiple interacting levels. Parents can describe how environmental values are communicated and modeled within household routines; educators and psychologists can illuminate developmental and relational mechanisms; and environmental advocates can contribute broader perspectives on institutional and community influences. Bringing these perspectives together may help explain how contact with nature, parental modeling, family communication, experiential learning, formal education, emotional connection, social norms, and policy environments interact over time. This perspective is consistent with emerging approaches that conceptualize environmental education as an ecological process requiring coordination among children, families, schools, and communities rather than as a discrete curricular intervention (Vuong et al., 2026). It also acknowledges that effective environmental education depends on active learning, meaningful participation, inclusive pedagogy, and opportunities for children to translate environmental knowledge into everyday practices (Kalla et al., 2022; Silva et al., 2025). By exploring these processes qualitatively within the sociocultural context of family life, it becomes possible to move beyond identifying whether certain variables are associated with pro-environmental behavior and instead clarify how environmentally responsible patterns become embedded in children's developing identities and relationships.

Accordingly, the aim of the present study was to explore adult perspectives on the antecedents, developmental mechanisms, and familial, educational, psychological, and societal drivers shaping children's pro-environmental behavior.

2. Methods and Materials

2.1. Study Design and Participants

The present study was conducted within an interpretive–constructivist paradigm using a qualitative and inductive approach. A phenomenological research strategy was adopted because it is particularly appropriate for exploring lived experiences and understanding how individuals construct meanings around complex and multidimensional phenomena. Within this framework, the study sought to capture participants' subjective understandings and experiences of parent–child pro-environmental behavior and to identify the psychological, familial, educational, and social processes through which such behaviors are developed, transmitted, and reinforced. The study was conducted in an urban context in Iran, within a sociocultural environment characterized by strong family-centered values and increasing public attention to environmental concerns. Cultural norms related to parenting, education, family interaction, and environmental responsibility were therefore considered important contextual elements in interpreting participants' accounts. Data collection was carried out from May 1, 2025, to February 15, 2026. Participants were recruited through purposive sampling on the basis of their direct personal or professional experience with

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environmental behaviors in family, educational, or community contexts. The final sample consisted of 12 participants, including parents, members of pro-environmental organizations, and educational psychologists. Some of the educational psychologists were also parents, which provided overlapping professional and personal perspectives and contributed to a richer understanding of parent–child environmental interactions. Participants represented different educational levels, socioeconomic backgrounds, and occupational roles, thereby increasing variation in perspectives and strengthening the depth of the qualitative data. Eligibility required participants to have at least one child, or relevant professional or practical involvement in environmental education or pro-environmental activities, to be willing to participate voluntarily, and to be capable of articulating experiences and perceptions relevant to the research objectives. The ages of participants' children ranged from early childhood to adolescence, allowing the study to capture perspectives related to different developmental stages of parent–child environmental interaction. Participants were excluded if they withdrew consent or were unable to complete the interview process. Sampling continued concurrently with data collection and analysis until data saturation was achieved, defined as the point at which additional interviews no longer generated new concepts, codes, subcategories, or themes.

2.2. Instruments

Data were collected primarily through semi-structured, in-depth interviews, which provided participants with sufficient flexibility to describe their experiences, interpretations, and perceptions in their own words while ensuring that the central research domains were addressed consistently across interviews. Depending on participant availability and practical circumstances, interviews were conducted either face-to-face or through secure online platforms. Each interview lasted approximately 45 to 70 minutes and was audio-recorded after obtaining the participant's consent to ensure accurate transcription and analysis. A semi-structured interview guide was developed on the basis of the study objectives and the relevant literature on environmental behavior, family socialization, environmental education, and parent–child interactions. The interview guide focused on participants' perceptions of the ways in which the family environment influences children's environmental attitudes and behaviors, the processes through which environmental responsibility and respect for nature are communicated, encouraged, modeled, and reinforced within families, and the extent to which children themselves influence environmental practices and decision-making within the household. Examples of the central interview questions included asking participants how the family environment shapes children's environmental attitudes and behaviors, how environmental responsibility and respect for the natural environment are conveyed or demonstrated within the family, and how children contribute to or modify environmental practices and decisions in family life. Follow-up and probing questions such as "Why?", "How?", and "Can you give an example?" were used throughout the interviews to clarify meanings, obtain concrete examples, explore underlying mechanisms, and deepen participants' descriptions of their experiences. The ordering of interview questions was flexible and was adapted according to the flow of each conversation, enabling participants to elaborate on issues they considered particularly important. In addition to the interviews, a demographic information checklist was used to record participant characteristics, including age, gender, education, place of residence, marital status, number and age of children, and occupation. These contextual data were used to describe the sample and support interpretation of differences and similarities across participant accounts.

2.3. Data Analysis

Data analysis was conducted using an inductive thematic analysis approach and was supported by MAXQDA 2024 software for systematic organization, coding, retrieval, and comparison of qualitative material. All interviews were transcribed verbatim, and the researchers initially became familiar with the data through repeated and careful reading of the transcripts. Meaningful semantic units relevant to the study objectives were then identified and assigned initial open codes. Similar and conceptually related codes were compared continuously and grouped into preliminary subcategories, after which broader categories and themes were developed through constant comparison across interviews. Throughout the analytical process, emerging categories were repeatedly reviewed against the original transcripts to ensure that they remained grounded in participants' accounts. Themes were progressively refined to improve internal coherence within each theme and conceptual distinction between different themes. Analysis and data collection proceeded iteratively, allowing emerging

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concepts to inform subsequent interviews and enabling the researchers to assess the adequacy and saturation of the developing thematic structure. Data saturation was confirmed when additional interviews produced no substantively new codes, categories, or themes. Methodological rigor was addressed through the criteria of credibility, transferability, dependability, and confirmability. Credibility was strengthened through member checking with all 12 participants, whereby interview summaries and interpretations were shared with participants for verification and follow-up discussion, and consensus was reached regarding the accuracy of the interpretations. Transferability was supported by recruiting participants from different relevant roles, including parents, educational psychologists, and environmental advocates, and by providing sufficient contextual information regarding participants and the study setting while maintaining anonymity. Dependability was enhanced by having the primary researcher complete the initial coding and a second coder independently recode 20% of the qualitative material; minor coding discrepancies were subsequently discussed and resolved through consensus. Confirmability was further strengthened through expert review by five professors, who evaluated the clarity and coherence of themes, the adequacy of supporting quotations, and the logical relationship between categories and interpretations. Based on their feedback, minor revisions were made to theme labels and selected quotations, thereby enhancing the transparency, consistency, and analytic credibility of the final thematic framework.

3. Findings and Results

The mean age of the participants was 38.5 years (Standard Deviation = 7.2), with a range of 28 to 55 years. The majority of them (n=7) were in the 30 to 45 age group. In terms of gender, 8 participants (66.7%) were female and 4 (33.3%) were male. Their educational levels were diverse, including one with a high school diploma, two with a Bachelor's degree, six with a Master's degree, and three with a Doctorate, indicating a prevalence of higher education and a depth of knowledge in the subject area. Participants were predominantly from urban areas of Tehran province (n=9), while two resided in semi-urban areas and one in a rural area. Out of the 12 participants, 10 were married, 1 was single, and 1 was divorced/widowed. Among the 5 participants who were parents, the number of children varied from 1 to 3, with most having one or two children. This diversity in demographic characteristics and social roles significantly contributed to the richness of the data and the coverage of various dimensions of the phenomenon from different perspectives. The findings from interviews with 12 participants were subjected to thematic analysis, ultimately leading to the identification of 6 main themes and 16 sub-themes.

Main Theme 1: Environmental Impacts on Psychological Dimensions and Parent-Child Interactions This theme addresses the vital role of the environment in mental health, emotional well-being, and the quality of intra-family relationships. The findings indicated that a clean and natural environment has positive effects on emotional effects and psychological well-being. Participants pointed to experiencing peace, happiness, mental balance, and a reduction in psychological stress for themselves and their children when in contact with nature. Nature was identified as a source for mental tranquility and managing children's positive energy, which can contribute to increasing parental resilience and reducing mental disorders in the new generation. For example, Participant #3 stated: "When we go into nature, it feels as if all the tension disappears. I find peace, and the children are happier and argue less. In a way, nature improves our relationships as well." In the same vein, Participant #8 considered a polluted environment to be "soul-eroding" and confirmed that children experience greater peace in a clean environment. Furthermore, this theme addresses the dynamics and quality of family relationships; the environment helps strengthen family bonds by increasing positive interactions, improving parent-child relationships, controlling and reducing tensions, and creating a safe and peaceful space. Participant #6 mentioned the increased opportunity for conversation and play in nature, leading to deeper connections, and Participant #12 confirmed the reduction of challenges and tensions among children in natural settings. The third aspect of this theme is cognitive growth and individual skills, which emphasizes nature's role in fostering curiosity, creativity, the ability to ask questions, and finding logical answers in children. Participant #2 noted that children's questions in nature and their efforts to find answers strengthen their cognitive skills, and Participant #4 considered practical experience in nature to be far more effective than purely theoretical instruction.

Main Theme 2: Multi-level Determinants of Parent-Child Pro-Environmental Behavior This theme examines the factors influencing pro-environmental behavior at different individual (parental), family, and social levels. Individual and psychological factors include parents' environmental

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knowledge and awareness, their personal aesthetics, and their positive or negative attitudes (pro-environmental, indifferent, profit-oriented) toward the environment, which form the internal foundations of pro-environmental behavior. Participant #1 emphasized the importance of parents' awareness and belief, and Participant #7 considered the role of parental attitude vital in shaping a child's behavior. At the family level, family and upbringing factors play a pivotal role, including the family's environmental culture and values, a sustainable lifestyle, parental responsibility, adherence to values, consistency of speech and action, and children's modeling of their parents' behavior. Participant #7 reiterated the importance of parental responsibility and the consistency of their speech and actions, and Participant #1 identified a family culture of respecting nature and a sustainable lifestyle as influential. Finally, social and institutional factors also have broad impacts on pro-environmental behavior, including the influence of the environment as a societal culture, the role of society and surroundings, cultural and religious structures, peers, policy-making and governance, the education system, and media and computer games. Participant #7 pointed to the complementary role of society and education alongside the family, and Participant #12 deemed policies and infrastructure important in facilitating correct environmental behaviors.

Main Theme 3: Learning Processes and Transmission of Environmental Behavior This theme pertains to the methods through which pro-environmental behaviors are transmitted from parents to children and within society. Observational learning and modeling was identified as one of the most significant processes, emphasizing the importance of parental behavioral patterns and children's imitation of these behaviors. Participant #5 noted children's close attention to their parents' actions, stating: "Children watch what we do very carefully… Our actions are more important to them than our words." Participant #3 spoke of her daughter imitating her by using a personal water bottle instead of a disposable cup. Communication and verbal interactions play another role in this process, including parents' dialogue with children to increase awareness, provide motivation, talking with elements of nature, teaching in the child's presence, and explaining the value of natural resources. Participant #9 mentioned discussing environmental documentaries with his children, and Participant #2 spoke of telling nature stories to her child. Furthermore, experiential and participatory learning emphasizes acquiring vital skills through practical experience by participating in environmental events and activities, collective family activities (such as clean-ups, planting, recycling), raising plants and animals, excursions in nature, and symbolic actions. Participant #5 considered participating in clean-up campaigns a very effective experience for children, and Participant #4 described waste segregation at home as an effective symbolic action.

Main Theme 4: Internalization of Values and Environmental Identity This theme addresses the deeper process of shaping children's beliefs, values, and personal identity in relation to the environment. The findings showed that the internalization of values and environmental identity occurs through the transfer of sustainable values, early familiarity with the environment, environmental identity formation, and the shaping of the child's intellectual foundation. This process leads children to perceive nature as their mother or protector, resulting in increased kindness and altruism towards it and fostering a friendship among the elements of nature. In this regard, Participant #1 stated: "I try to teach them from a young age that nature is our second home, like a kind mother we must care for. This way, an internal sense of belonging and responsibility forms within them." Participant # 8 added that early familiarity with the environment causes children to develop an environmental identity and see themselves as part of nature. This internalization ultimately helps to strengthen the societal culture regarding the environment.

Main Theme 5: Educational Strategies and Interventions This theme focuses on practical and purposeful methods for promoting and reinforcing pro-environmental behaviors in children. Educational and cultural strategies include the use of collective environmental reading and book clubs, storytelling, watching environmental films and animations, and providing proper environmental education to students, all of which help to enhance children's knowledge and attitudes. Participant #9 mentioned reading books and watching environmental animations at home, and Participant #11 considered storytelling about animals and trees an excellent way to connect children with nature. Alongside this, motivational and reinforcement strategies include using environmental reward and punishment systems and offering socio-emotional rewards for positive environmental behaviors, which can lead to the reinforcement and sustainability of these behaviors. Participant #9 mentioned encouraging his children for correct environmental behaviors, which makes these actions appealing, and Participant #10 considered parental praise a significant emotional reward for children. Finally, activation and empowerment strategies refer to approaches that turn

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children into agents of change, including training students as family teachers, reverse education from child to parent, and emphasizing the priority of parental action over words and the integration of their beliefs and behaviors. Participant #7 referred to the phenomenon of "reverse education," where children transfer what they have learned at school to their parents, and Participant #5 emphasized the importance of integration between parental belief and behavior.

Main Theme 6: Outcomes of Environmental Upbringing This theme addresses the long-term results and effects of environmental upbringing on children's cognitive, attitudinal, behavioral, and developmental dimensions. Cognitive and attitudinal outcomes include the changing and deepening of children's attitudes toward the environment, increased environmental awareness, averting indifference, and creating appeal in environmental issues for them. Participant #11 stated: "The result of this education is that the children themselves become sensitive. If they see someone littering, they protest or pick it up themselves. This change in attitude is very important." Participant #4 also considered environmental awareness a result of early contact with nature. On a practical level, behavioral and ethical outcomes include the correction and institutionalization of individual and group behavior, refraining from environmental destruction, a positive response to environmental protection, and using nature as a criterion in adult decisions. Participant #6 stated that children use nature as a criterion for their decisions in adulthood, and Participant #11 also pointed to the institutionalization of correct behaviors in children. Finally, developmental and long-term outcomes refer to the impact of environmental upbringing on children's future career path and responsibility, as well as the reduction of mental disorders in the new generation due to living in a healthier environment. Participant #11 considered this education important not only for the present but also for the future careers and responsibilities of children, and Participant #7 highlighted the impact of a healthy environment on reducing mental disorders in the new generation.

Table 1

The Coding Process to Achieve Main Categories

Main Theme	Sub-theme	Initial Code
Environmental Impacts on Psychological Dimensions and Parent-Child Interactions	Emotional Effects and Psychological Well-being	Peace and happiness of a clean environment, Stress of a polluted environment, Mental balance of parents and child, Reduction of psychological distress, Mental peace in nature, Nature as a source of tranquility, Management of children's energy, Channeling positive energy, Increased parental resilience, Greater parental peace
	Dynamics and Quality of Family Relationships	Increase in positive interactions, Reduced quality of relationships in stressful environments, Improved parent-child relationships, Control and reduction of parent-child tension, Safe and peaceful space, Increased rest time for parents, Opportunity for other activities, Reduction of challenges in parent-child relationships
	Cognitive Growth and Individual Skills	Interaction limitations in the city, Experience from nature, Vital education from nature, Skill development, fostering curiosity and creativity, Finding logical answers in nature, Comparison of rural/urban independence, Practical experience, Ground for inquiry and progress
Multi-level Determinants of Parent-Child Pro-Environmental Behavior	Individual and Psychological Factors	Environmental knowledge and awareness, Individual aesthetics, Parents' positive/negative attitudes toward the environment (pro-environmental/indifferent/profit-oriented)
	Family and Upbringing Factors	Family's environmental culture and values, Sustainable/unsustainable lifestyle, Parental responsibility, Adherence to environmental values, Consistency of speech and action, Importance of the child's position, Children's satisfaction, Influence of family culture, Connection between respect for nature and parental affection, Children's awareness of parents' environmental behavior
	Social and Institutional Factors	Environment as a societal culture, Influence of society and surroundings, Cultural and religious structures, Role of peers, Policy-making and governance, Education system, Media and computer games, Economic status, Independence of environmental behavior from social class, Contradictory evidence (negative behavior with high social status)
Learning Processes and Transmission of Environmental Behavior	Observational Learning and Modeling	Parental behavioral patterns, Children's imitation, learning environmental behaviors, Children's attention to parental behavior, Parental efforts, observing affectionate behavior, reinforcing imitation, Playing a role model, Ease of modeling parents
	Communication and Verbal Interactions	Parent-child dialogue and increasing child's awareness, Motivation through dialogue, Dialogue with elements of nature, Teaching in the child's presence, Transforming thought into behavior, Explaining the value of natural resources, Methods of conservation and restoration
	Experiential and Participatory Learning	Participation in environmental events and activities, Collective family activities (clean-ups, planting, recycling), Raising plants and animals, Excursions in nature, Symbolic

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		actions (waste segregation, turning off lights/water), Competitions and games, listening to nature, Practical experience and answering questions, Acquiring vital skills
	Internalization of Values and Environmental Identity	Transfer of sustainable values, Early familiarity with the environment, Environmental identity formation, Shaping the child's intellectual foundation, Perceiving nature as a mother/protector, Increased kindness and altruism, Explaining the love for nature, fostering friendship among nature's elements, Internalization of societal culture
Educational Strategies and Interventions	Educational and Cultural Strategies	Collective environmental reading and book clubs, Storytelling, Watching environmental films and animations, Proper environmental education for students
	Motivational and Reinforcement Strategies	Environmental reward system, Environmental punishment system, Socio-emotional rewards for respecting nature
	Activation and Empowerment Strategies	Training students as family teachers, Reverse education from child to parent, Priority of parental action over words, Integration of parental belief and behavior, Superiority of practical influence over verbal
Outcomes of Environmental Upbringing	Cognitive and Attitudinal Outcomes	Changing and deepening children's attitudes, increased environmental awareness, averting indifference, Creating environmental appeal, Initial exposure to environmental challenges
	Behavioral and Ethical Outcomes	Correction and institutionalization of individual and group behavior, refraining from environmental destruction, Positive response to environmental protection, Using nature as a criterion in adult decisions
	Developmental and Long-term Outcomes	Impact on future career path and responsibility, Reduction of mental disorders in the new generation (long-term mental health outcome)

4. Discussion and Conclusion

The present study explored adult perspectives on the antecedents and drivers of children's pro-environmental behavior and revealed six interconnected themes: environmental impacts on psychological dimensions and parent–child interactions, multilevel determinants of parent–child pro-environmental behavior, learning processes and transmission of environmental behavior, internalization of values and environmental identity, educational strategies and interventions, and outcomes of environmental upbringing. Taken together, these findings indicate that children's pro-environmental behavior is not formed through a single pathway but rather emerges through the interaction of psychological, familial, educational, social, and experiential processes. The results further suggest that environmental behavior is embedded in everyday relationships and routines, with parents, schools, communities, and broader social structures jointly influencing the development of environmental attitudes and practices. This multilevel pattern is consistent with research emphasizing that environmental behavior among children and adolescents depends on the interaction of knowledge, attitudes, social influences, educational opportunities, and contextual conditions (Isa & Halim, 2023; Razali et al., 2023). It also aligns with recent work highlighting the importance of coordinating family and school environmental education rather than treating these domains as independent sources of influence (Vuong et al., 2026).

The first theme showed that contact with clean and natural environments was perceived as beneficial for children's emotional well-being, psychological balance, cognitive development, and the quality of parent–child relationships. Participants described nature as a setting that reduced tension, increased calmness, encouraged positive interactions, and stimulated children's curiosity and creativity. These findings are consistent with evidence suggesting that nature-based experiences can promote children's psychological well-being and mental health while also creating opportunities for engagement, exploration, and learning. Nature-based school interventions have been specifically examined as mechanisms for improving emotional functioning and well-being among children (Loose et al., 2023; Loose et al., 2024). The present findings extend this perspective by showing that adults perceive nature not only as beneficial for the child individually but also as a relational context that can improve communication and reduce conflict within the family. This interpretation is also compatible with research suggesting that exposure to natural and green environments can reinforce both environmental engagement and broader developmental outcomes (Tusyanah et al., 2023). Furthermore, evidence that feelings of connectedness and oneness can enhance pro-environmental attitudes supports the view that emotional experience may be an important mechanism linking psychological well-being with environmental concern (Chen et al., 2024).

The second theme identified multiple determinants of children's pro-environmental behavior at individual, family, and social levels. At the individual level, parental knowledge, awareness, attitudes, and aesthetic sensitivity toward the environment were perceived as important influences. At the family level, environmental culture,

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lifestyle, parental responsibility, and consistency between beliefs and actions were emphasized. At the social level, education systems, peers, media, cultural norms, governance, and available infrastructure were described as complementary influences. This layered pattern corresponds with findings showing that psychological and contextual variables jointly shape pro-environmental behavior and that limited participation in environmental activities may reflect both motivational and structural barriers (Ratriyana, 2023; Razali et al., 2023). Systematic research among middle-school students likewise suggests that environmental knowledge alone is insufficient unless educational, social, and motivational conditions enable behavior to be enacted (Isa & Halim, 2023). The current results are particularly important because they indicate that participants did not view parental influence in isolation; instead, family practices were understood as operating within a broader cultural and institutional environment. This supports the argument that environmental responsibility is more likely to become sustainable when schools, families, and communities reinforce compatible environmental norms (Vuong et al., 2026).

The third theme concerned learning processes and the transmission of environmental behavior, particularly through modeling, verbal interaction, and experiential participation. Participants repeatedly emphasized that children observe what parents do and that parental behavior may be more influential than verbal instruction alone. This result supports the broader educational principle that behavior is strengthened when instruction is accompanied by observable practice and meaningful participation. Environmental education studies have demonstrated that active, project-based, and participatory learning can strengthen attitudes, values, and action competence because students are directly involved in applying environmental knowledge (Đorđević et al., 2026; Kalla et al., 2022). Similarly, school-based participatory activities can promote environmental citizenship by engaging children in real problems and collective decision-making (Silva et al., 2025). The emphasis participants placed on joint family activities such as recycling, clean-up activities, planting, and caring for animals also reflects this principle of experiential learning. Awareness interventions have likewise shown that pro-environmental habits can be strengthened when individuals are provided with concrete, behaviorally relevant environmental information (Zafar et al., 2024). Thus, the present findings reinforce the importance of integrating observation, communication, and direct participation rather than relying solely on verbal teaching.

The importance of dialogue between parents and children also emerged strongly within the third theme. Participants described environmental conversations, explanations about natural resources, storytelling, and discussion of environmental media as important mechanisms through which children develop understanding and motivation. This is compatible with research in other developmental domains demonstrating that repeated parent–child interaction plays a central role in learning. Studies of home literacy and home learning environments, for example, show that sustained parental engagement supports children's cognitive and educational development (Avelar et al., 2023; Lau & Richards, 2021). Likewise, research on parental involvement among children from lower socioeconomic backgrounds shows that supportive interaction can substantially influence learning outcomes (Yang, 2024). Although these studies concern literacy and language rather than environmental behavior, they support the broader mechanism identified in the present study: children's learning is strengthened when parents create repeated opportunities for discussion, modeling, practice, and reinforcement. The findings therefore suggest that the household may function as an informal environmental learning environment in which everyday communication gradually transforms abstract environmental knowledge into personally meaningful values and behaviors.

The fourth theme focused on the internalization of environmental values and the development of environmental identity. Participants believed that early exposure to nature, repeated reinforcement of environmental responsibility, and sustained family practices could lead children to perceive themselves as connected to nature and responsible for protecting it. This finding is particularly important because it suggests that the goal of environmental upbringing extends beyond compliance with specific behaviors such as recycling or conserving water. Instead, environmental learning may become incorporated into the child's self-concept and worldview. Research on adolescents' environmental attitudes similarly indicates that transformative education should address values, identity, agency, and moral meaning in addition to factual knowledge (Muñoz-García et al., 2022). Metacognition-based environmental education among preschoolers has also shown that even young children can be encouraged to reflect on their actions and develop more deliberate pro-environmental responses (Rulli et al., 2024). The present

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findings therefore suggest that environmental identity may be constructed gradually through repeated family messages, early contact with nature, and opportunities to interpret environmental care as part of who the child is rather than merely what the child is expected to do.

This identity-related process may also help explain the participants' emphasis on kindness, altruism, and emotional attachment to nature. Environmental concern may be strengthened when children experience nature as relationally meaningful rather than as an abstract object of scientific instruction. Research showing that loving-kindness practices can influence feelings of connectedness and pro-environmental attitudes supports the possibility that emotional and moral orientations contribute to environmental responsibility (Chen et al., 2024). Likewise, conservation education research suggests that meaningful learning outcomes are more likely when educational experiences foster not only knowledge but also affective and behavioral engagement (Guinart et al., 2022; Schilbert & Scheersoi, 2022). The current study adds a family-centered perspective to this literature by suggesting that emotional meanings attached to nature may be transmitted through parental language, metaphors, affection, and everyday routines. Such processes may help children interpret environmental protection as an ethical and relational obligation.

The fifth theme concerned educational strategies and interventions. Participants emphasized storytelling, books, environmental films, school-based instruction, reward systems, emotional reinforcement, and empowerment strategies. They also described children as potential agents who could transfer environmental knowledge from schools back into their households. These findings are consistent with studies showing that well-designed environmental education programs can influence both knowledge and behavior. Long-term conservation education has been associated with sustained improvements in children's environmental knowledge and conduct (Chanvin et al., 2023), while climate change education research indicates that educational programs can affect cognition, attitudes, and behavior when intervention content is sufficiently engaging and behaviorally relevant (Bottin et al., 2026). Teaching practices themselves may also influence students' environmental orientations, particularly when environmental responsibility is integrated into classroom activities rather than treated as an isolated topic (Díaz et al., 2021). The current findings support these results while highlighting the value of connecting formal education with family-based reinforcement.

The concept of children as environmental educators within the household is especially noteworthy. Participants described a form of reverse education in which children bring school-based environmental learning home and influence parental practices. This interpretation is consistent with the idea that children are not passive recipients of environmental socialization but can act as active environmental citizens. Studies of child climate activism demonstrate that children are capable of expressing environmental concerns, participating in collective action, and influencing public and community discourse (Rios et al., 2023). Similarly, coordinated school-family models emphasize that environmental learning can circulate between educational institutions and households rather than moving only from adults to children (Vuong et al., 2026). This reciprocal interpretation broadens conventional accounts of environmental socialization by recognizing children's agency within family decision-making.

The sixth theme concerned the outcomes of environmental upbringing, including increased environmental awareness, stronger ethical sensitivity, more stable pro-environmental behavior, improved decision-making, and possible long-term developmental effects. Participants believed that early environmental education could influence not only immediate actions but also children's later life choices, responsibilities, and occupational orientations. This finding is broadly consistent with evidence showing that environmental education can have sustained effects when it provides repeated, meaningful, and developmentally appropriate learning opportunities (Bottin et al., 2026; Chanvin et al., 2023). Project-based sustainability learning may also strengthen students' action competence by helping them understand how environmental knowledge can be translated into practical decisions (Kalla et al., 2022). The present study suggests that the long-term impact of environmental upbringing may depend on the extent to which environmental values become embedded in identity and reinforced across multiple social contexts.

The findings also indicate that effective environmental education should be inclusive and responsive to children's differing developmental, cultural, linguistic, and educational needs. Although participants did not explicitly frame this issue in terms of special education, the broader literature demonstrates that educational interventions are more effective when they recognize differences in learners'

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abilities and communication needs (Evans et al., 2021; Hartman et al., 2023). Environmental programs can likewise benefit from culturally and linguistically responsive approaches, particularly when working with diverse learners (Hartley et al., 2023). Research on dual-language and multilingual learning further demonstrates the importance of tailoring educational content to children's linguistic contexts (Kim et al., 2022; Li, 2024). These findings are relevant to the present study because family-based environmental education occurs within culturally specific systems of communication, parenting, and meaning. Cross-cultural research on parent–child emotional connection similarly emphasizes that relational behaviors should be interpreted within their cultural and linguistic context (Hane et al., 2024). Thus, environmental interventions should be flexible enough to accommodate diverse family structures and cultural understandings.

The current results also reinforce the importance of sustained parental engagement. Family-centered intervention studies across health and education show that parental participation can strengthen the effectiveness of behavioral programs when intervention content is integrated into everyday family routines (Badolato et al., 2026; Bonuck et al., 2022). Environmental health education programs specifically designed for parents and children have likewise shown the value of family-based learning structures (Lee et al., 2025). Similarly, culturally adapted parenting interventions demonstrate that engagement improves when intervention approaches reflect the lived realities of families (So et al., 2020). Programs targeting children with diverse health needs further highlight the importance of family adaptation, accessibility, and contextual sensitivity (Natale et al., 2024). These findings support the present study's conclusion that environmental education should not be limited to classroom instruction. Instead, parents should be considered active partners whose daily behavior and interaction patterns can either reinforce or weaken the effects of formal environmental education.

The broader educational literature also indicates that the intensity, timing, and continuity of learning experiences matter. Research on early language learning demonstrates that age, dosage, and socioeconomic context can influence educational outcomes (Ramírez et al., 2021), while sustainability education studies highlight the importance of institutional support and the conditions under which environmental knowledge is successfully developed (Sabrina Abdullah Aini Arifah binti Abdul, 2021). These observations are relevant to environmental socialization because occasional environmental messages may be insufficient to create lasting behavioral change. Rather, children may need repeated exposure across developmental stages and across multiple settings. Overall, the findings of the present study support an ecological interpretation of children's pro-environmental behavior in which psychological well-being, family modeling, experiential learning, educational opportunities, social structures, and environmental identity mutually reinforce one another.

Several limitations should be considered when interpreting these findings. The sample was small and purposively selected, as is appropriate for qualitative research, but participants were relatively oriented toward environmental and educational issues, which may have increased the likelihood of favorable views regarding environmental upbringing. The study was conducted within a specific Iranian sociocultural context, limiting the transferability of findings to families living in different cultural, socioeconomic, or institutional environments. The reliance on adult perspectives also means that children's own interpretations of family environmental practices were not directly examined. In addition, the use of self-reported interview data may have introduced social desirability bias, particularly because environmental responsibility is socially valued. Although multiple trustworthiness procedures were used, qualitative coding and theme development inevitably involve interpretive judgment, and alternative analytical perspectives may have generated somewhat different categorizations.

Future studies should examine parent–child pro-environmental behavior using larger and more diverse samples that include families with different socioeconomic backgrounds, environmental attitudes, and degrees of engagement with sustainability. Research should directly include children and adolescents so that their accounts can be compared with those of parents, educators, and environmental professionals. Longitudinal qualitative designs could clarify how environmental identity and household practices change across developmental stages, while mixed-methods studies could combine thematic findings with quantitative measures of environmental attitudes and observed behavior. Cross-cultural comparisons would be particularly valuable for identifying which mechanisms are broadly shared and which are shaped by specific cultural norms. Future research could also examine families who demonstrate resistance, indifference, or ambivalence toward environmental concerns in order to better understand barriers to environmental socialization.

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From a practical perspective, interventions should integrate family, school, and community efforts rather than targeting children in isolation. Parents should be encouraged to model consistent environmental practices, discuss environmental issues openly, and involve children in routine activities such as recycling, conserving energy, caring for plants, and participating in local environmental programs. Schools can complement these efforts through experiential, project-based, and age-appropriate activities that allow children to translate environmental knowledge into action. Programs should also create opportunities for children to share what they learn with family members, thereby strengthening reciprocal environmental learning within households. Policymakers and community organizations can further support these processes by providing accessible green spaces, environmental infrastructure, child-friendly educational media, and opportunities for meaningful participation in environmental decision-making. The most sustainable outcomes are likely to emerge when environmental responsibility becomes a consistent feature of children's daily relationships, routines, and identities.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the study and participated in the research with informed consent.

References

Avelar, D., Hull, D. M., & Middlemiss, W. (2023). Children's Pre-Academic School Readiness and Home Learning Activities: A Moderated-Mediation Analysis of Home Visiting. *Frontiers in psychology*, *14*. https://doi.org/10.3389/fpsyg.2023.1245893

Badolato, M., Diehl, D. C., Papanek, A., Duncan, J., Shelnutt, K. P., & Mathews, A. (2026). From Pilot to Practice: Developing a Family-Based Nutrition, Literacy, and Parenting Protocol for the Books &Amp; Cooks Education Intervention. *Future*, *4*(1), 6. https://doi.org/10.3390/future4010006

Bonuck, K. A., Collins-Anderson, A., Schechter, C. B., Felt, B. T., & Chervin, R. D. (2022). Effects of a Sleep Health Education Program for Children and Parents on Child Sleep Duration and Difficulties. *JAMA Network Open*, *5*(7), e2223692. https://doi.org/10.1001/jamanetworkopen.2022.23692

Bottin, M., Pizarro, A. B., Ramírez, L., Cadavid, S., Barbosa, S., Ocampo-Palacio, J. G., & Quesada, B. (2026). Systematic Review of the Effects of Climate Change Education on Cognition, Attitude, and Behavior of Schoolchildren and Their Entourage. *Environmental Research Letters*, *21*(10), 103001. https://doi.org/10.1088/1748-9326/ae628e

Chanvin, M., Lamarque, F., Diko, N., Agil, M., Micheletta, J., & Widdig, A. (2023). Ten Years of Positive Impact of a Conservation Education Program on Children's Knowledge and Behaviour Toward Crested Macaques (Macaca Nigra) in the Greater Tangkoko Area, North Sulawesi, Indonesia. *International Journal of Primatology*, *44*(4), 743-763. https://doi.org/10.1007/s10764-023-00356-9

Chen, H., Liu, C., Hsu, S.-E., Wu, K., Liu, C.-Y., & Chiou, W. K. (2024). The Effects of Short Video-App-Guided Loving-Kindness Meditation on Affect, Oneness, and Proenvironmental Attitude. *European Journal of Psychology Open*, *83*(2), 57-69. https://doi.org/10.1024/2673-8627/a000057

Díaz, G., Lomelí, D. G., & Juárez, C. A. M. (2021). A Structural Model of the Teaching Practice and Pro-Environmental Behavior in Elementary Mexican Students. *International Electronic Journal of Environmental Education*, *11*(1), 42-57. https://doi.org/10.18497/iejeegreen.781808

Đorđević, I., Jovanovic, S. G., Markovic, M., Andjelković, S., Prnjat, Z., Matović, S., & Valjarević, A. (2026). Project-Based Learning in Geography and Its Impact on Developing Students' Values, Attitudes and Pro-Environmental Behavior. *Sustainability*, *18*(2), 725. https://doi.org/10.3390/su18020725

Evans, W., Gable, R. A., & Habib, A. (2021). Lessons From the Past and Challenges for the Future: Inclusive Education for Students With Unique Needs. *Education Sciences*, *11*(6), 281. https://doi.org/10.3390/educsci11060281

Guinart, A. B., Korhonen-Kurki, K., & Cabeza, M. (2022). Typifying Conservation Practitioners' Views on the Role of Education. *Conservation Biology*, *36*(4). https://doi.org/10.1111/cobi.13893

Hane, A. A., Ludwig, R. J., Martinez, A. G., Masese, C., Vanhatalo, U., Goddard, C., Jaffe, M. E., Myers, M. M., & Welch, M. G.

E-ISSN: 2980-9681

(2024). Translation, Cross-Cultural Adaptation and Validation of the Universal Welch Emotional Connection Screen Using Primary and Bilingual Spanish-Speaking Coders of Videotaped Mother-Child Interactions. *Frontiers in Child and Adolescent Psychiatry*, *3*. https://doi.org/10.3389/frcha.2024.1346121

Hartley, J. M., Stevenson, K. T., Pereira, S. R., Peterson, M. N., Lawson, D. F., & Martinez, B. (2023). How a Marine Debris Environmental Education Program Plays to Strengths of Linguistically Diverse Learners. *Frontiers in Education*, *7*. https://doi.org/10.3389/feduc.2022.1058864

Hartman, M. C., Smolen, E. R., & Powell, B. (2023). Curriculum and Instruction for Deaf and Hard of Hearing Students: Evidence From the Past—Considerations for the Future. *Education Sciences*, *13*(6), 533. https://doi.org/10.3390/educsci13060533

Isa, N. S., & Halim, L. (2023). Challenges and Strategies to Develop Pro Environment Behaviours Among Middle School Students: A Systematic Literature Review. *International Journal of Academic Research in Business and Social Sciences*, *13*(11). https://doi.org/10.6007/ijarbss/v13-i11/19499

Kalla, M., Jerowsky, M., Howes, B., & Borda, A. (2022). Expanding Formal School Curricula to Foster Action Competence in Sustainable Development: A Proposed Free-Choice Project-Based Learning Curriculum. *Sustainability*, *14*(23), 16315. https://doi.org/10.3390/su142316315

Kim, S., Kang, V. Y., Kim, H., Wang, J., & Gregori, E. (2022). Online Literacy Instruction for Young Korean Dual Language Learners in General Education. *Journal of Behavioral Education*, *32*(4), 743-767. https://doi.org/10.1007/s10864-022-09470-9

Lau, C., & Richards, B. (2021). Home Literacy Environment and Children's English Language and Literacy Skills in Hong Kong. *Frontiers in psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.569581

Lee, H.-M., Kim, Y., Choi, H., Kwon, H.-J., Kim, H., & Cho, K. S. (2025). The Effectiveness of the Parent–Child VOC-Focused Environmental Education Program. *Sage Open*, *15*(3). https://doi.org/10.1177/21582440251346558

Li, L. (2024). Erasing Race and Disability From Educational Policies of a Chinese–English Dual Language Charter School. *Teachers College Record the Voice of Scholarship in Education*, *126*(4-5), 3-30. https://doi.org/10.1177/01614681241258833

Li, Y., Chan, Y. W., & Tseng, Y. C. (2025). Trends of Nature Education Research in China: A Scholarly Review. *Integrative Conservation*, *4*(3), 310-321. https://doi.org/10.1002/inc3.70039

Loose, T., Côté, S. M., Malboeuf-Hurtubise, C., Beaudet, J.-P. A., Lessard, G., Chadi, N., Gauvin, L., Morin, I., & Geoffroy, M. C. (2023). Protocol for the Open Sky School: A Two-Arm Clustered Randomized Controlled Trial to Test the Effectiveness of a Nature-Based Intervention on Mental Health of Elementary School Children. *BMC public health*, *23*(1). https://doi.org/10.1186/s12889-023-15033-y

Loose, T., Fuoco, J., Malboeuf-Hurtubise, C., Ayotte-Beaudet, J. P., Gauvin, L. I., Chadi, N., Ouellet-Morin, I., Mâsse, B. R., Côté, S. M., & Geoffroy, M. C. (2024). A Nature-Based Intervention and Mental Health of Schoolchildren. *JAMA Network Open*, *7*(11), e2444824. https://doi.org/10.1001/jamanetworkopen.2024.44824

Muñoz-García, I. M., Alcántara-Manzanares, J., & Quintana, S. M. (2022). Key Aspects of Adolescents' Environmental Attitudes With a View to Transformative Education. *Education Sciences*, *12*(9), 591. https://doi.org/10.3390/educsci12090591

Natale, R., Schladant, M., Bloyer, M., Hernandez, J., Palenzuela, J., Agosto, Y., Peng, Y., & Messiah, S. E. (2024). A Randomized Controlled Cluster Trial of an Obesity Prevention Program for Children With Special Health Care Needs: Methods and Implications. *Nutrients*, *16*(9), 1274. https://doi.org/10.3390/nu16091274

Ramírez, N. F., Sheth, K. K., & Kuhl, P. K. (2021). The Effects of Age, Dosage, and Poverty on Second Language Learning Through SparkLingTM in Infant Education Centers in Madrid, Spain. *International journal of environmental research and public health*, *18*(23), 12758. https://doi.org/10.3390/ijerph182312758

Ratriyana, I. N. (2023). Why They Do Not Care? Exploring young Indonesians' Low participation In proenvironmental Activities. *Asian Education and Development Studies*, *12*(4/5), 310-323. https://doi.org/10.1108/aeds-03-2023-0029

Razali, G., Hidayat, R. S., & Mujahid, M. U. F. (2023). Psycological Factors Influencing Pro-Environmental Behavior in Urban Areas. *West Science Interdisciplinary Studies*, *1*(07), 408-415. https://doi.org/10.58812/wsis.v1i07.126

Rios, C., Neilson, A., & Menezes, I. (2023). « Faisons-Nous Entendre » : L'activisme Climatique Des Enfants Dans Une Forêt Locale. *Educations*, *7*(1). https://doi.org/10.21494/iste.op.2024.1123

Rulli, M., Bruni, E. M., Domenico, A. D., & Mammarella, N. (2024). Educating Preschoolers to Pro-Environmental Actions: A Metacognition-Based Approach. *Journal of Education in Science Environment and Health*, 179-189. https://doi.org/10.55549/jeseh.727

Sabrina Abdullah Aini Arifah binti Abdul, K. (2021). Critical Success Factors of Knowledge on Sustainability in Malaysian Higher Education. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, *12*(5), 74-83. https://doi.org/10.17762/turcomat.v12i5.732

Schilbert, J., & Scheersoi, A. (2022). Learning Outcomes Measured in Zoo and Aquarium Conservation Education. *Conservation Biology*, *37*(1). https://doi.org/10.1111/cobi.13891

Silva, D. F. P., Barbosa, M. O., Ribeiro, N., & Menezes, I. (2025). Promoting Environmental Citizenship Using Participatory School-Based Community Profiling on Water (Mis)uses. *ECNU Review of Education*, *8*(1), 79-111. https://doi.org/10.1177/20965311241264829

So, M., Rojo, A. L. A., Robinson, L. R., Hartwig, S. A., Lee, A. R. H., Beasley, L. O., Silovsky, J. F., Morris, A. S., Titchener, K. S., & Zapata, M. I. (2020). Parent Engagement in an Original and Culturally Adapted Evidence-based Parenting Program, Legacy for Children™. *Infant Mental Health Journal Infancy and Early Childhood*, *41*(3), 356-377. https://doi.org/10.1002/imhj.21853

Tusyanah, T., Ismiyati, I., Suryanto, E., & Susilowati, N. (2023). Does Green Space Signify on Students' Academic Performance and Pro-Environmental Behavior? An Empirical Study at a Pro-Environmental University. *Journal of Steam Education*, *6*(1), 84-100. https://doi.org/10.55290/steam.1149958

Vuong, Q. H., Duong, T. M. P., La, V. P., Li, D., & Nguyen, M. H. (2026). Coordinated School and Family Environmental Education Efforts for a Generation of Eco-Surplus Culture. *Australian Journal of Environmental Education*, *42*(4), 1042-1065. https://doi.org/10.1017/aee.2026.10174

Yang, J. (2024). Enhancing Language Acquisition in Children From Lower Socioeconomic Backgrounds: The Role of Parental Involvement. *Lecture Notes in Education Psychology*

E-ISSN: 2980-9681

and Public Media, *70*(1), 14-20. https://doi.org/10.54254/2753-7048/70/20240948

Zafar, M. A., Gill, A. R., Nawaz, M. A., & Ahmad, T. I. (2024). Fostering Environmental Friendly Habits Through Awareness Intervention: An Experimental Study to Analyze SDG 12. *The Asian Bulletin of Green Management and Circular Economy*, *4*(1). https://doi.org/10.62019/abgmce.v4i1.88

E-ISSN: 2980-9681