

ORIGINAL ARTICLE

Antecedents and Factors Associated with Parent-Child Pro-Environmental Behavior: A Qualitative Content Analysis Study

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ABSTRACT

The environmental crisis is a critical issue for both current and future generations, driving research toward exploring the key factors that motivate individuals to engage in pro-environmental behaviors from an early age. Therefore, the present study was conducted with the aim of deeply investigating the contexts and factors associated with pro-environmental parent-child behavior, using a qualitative thematic analysis approach. In this study, 15 participants (including parents, members of environmental organizations, and educational psychologists) participated in semi-structured interviews through purposive sampling until data saturation was reached. Data were analyzed using MAXQDA 2024 software. To ensure the validity of the findings, criteria of credibility, dependability, confirmability, and transferability were maintained. The findings, through thematic analysis of the interviews, identified six main themes: “Environmental Impacts on Psychological Dimensions and Parent-Child Interactions,” “Multilevel Determinants of Pro-environmental Parent-Child Behavior,” “Processes of Learning and Environmental Behavior Transmission,” “Internalization of Values and Environmental Identity,” “Educational Strategies and Interventions,” and “Consequences of Environmental Upbringing.” These themes comprehensively explain the contexts and factors related to pro-environmental parent-child behavior. The findings emphasize the vital role of the environment on psychological well-being, the influence of multilevel factors (individual, familial, and social), observational and experiential learning processes, and the internalization of environmental identity in transmitting these behaviors. This study highlights the necessity of designing participatory and practical educational interventions, promoting direct contact with nature, and developing supportive policies, while suggesting the need for future longitudinal and mixed-methods research.

KEYWORDS

Parent-child Behavior, Pro-environmental Behavior, Qualitative Content Analysis.



Introduction

The environmental crisis constitutes a critical challenge for both present and future generations, steering scholarly inquiry toward identifying the key determinants that foster pro-environmental behaviors from an early age. The present study follows an interpretive (constructivist) paradigm and employs a qualitative (inductive) approach. The research strategy is content analysis, since many qualitative researchers believe that knowledge about human beings can only be obtained through descriptions of human experiences as they are directly recounted by the individuals themselves. In this context, content analysis is recognized as an appropriate method for a deep understanding of experiences and for capturing the meanings of complex, multidimensional concepts. The researcher's aim, within this approach, is to grasp the meaning of the experience exactly as the participant has lived it.

Methodology

In this study, 15 participants (parents, members of environmental advocacy associations, and educational psychologists) were recruited through purposive sampling until data saturation was reached, engaging in semi-structured interviews. Example questions included: "Can you describe how you involve your child in environmentally friendly activities at home?" "What factors influence your decision to encourage or discourage your child's pro-environmental behavior?" "Can you share an experience where your child responded positively or negatively to your environmental guidance?" "How do you balance environmental concerns with other parenting priorities?" Follow-up and probing questions were used to clarify responses and gain deeper insights into parents' motivations, attitudes, and perceived barriers related to pro-environmental behavior. Interviews lasted between 45 and 75 minutes and were conducted in a location convenient for participants, either in person or via telephone, depending on participant preference. All interviews were audio-

recorded with participants' consent and later transcribed verbatim for analysis.

Results

Data were analyzed using MAXQDA 2024 software. To ensure the trustworthiness of the findings, criteria such as credibility, dependability, confirmability, and transferability were adhered to. 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, 10 participants (66.7%) were female and 5 (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 six 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 ($n = 12$), while two resided in semi-urban areas and one in a rural area. Out of the 15 participants, 10 were married, 1 was single, and 4 were divorced/widowed. Among the 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.

Conclusion

This qualitative study, using qualitative content analysis, explored the backgrounds and factors associated with pro-environmental parent-child behavior. Interviews with 15 participants (including parents, environmental advocates, and educational psychologists) led to the identification of six core categories and sixteen subthemes, revealing the complexity of this phenomenon. The study's content analysis identified six main categories: "Environmental Impacts on Psychological Well-being and Parent-Child Interactions," "Multilevel Determinants of Parent-Child Pro-Environmental Behavior," "Learning Processes and Intergenerational Transmission

of Pro-Environmental Behavior,” “Internalization of Environmental Values and Identity,” “Educational Strategies and Interventions,” and “Outcomes of Environmental Upbringing.” These categories comprehensively elucidate the antecedents and factors associated with parent–child pro-environmental behavior.

The first core category, “Environmental Influences on Psychological Dimensions and Parent–Child Interactions,” highlighted nature’s role in emotional well-being and relationship quality. Subthemes included emotional impacts, family dynamics, and cognitive development. The second category, “Multilevel Determinants of Environmental Behavior in Parent–Child Dynamics,” detailed the individual, family, and societal factors that influence such behaviors. Subthemes included personal knowledge, attitudes, family values, parental responsibility, and social structures like education, media, and policy.

The findings emphasize the vital role of the environment in psychological well-being, the influence of multilevel factors (individual, family, social), observational and experiential learning processes, and the internalization of environmental identity in transmitting these behaviors. This study highlights the necessity of designing participatory and practical educational interventions, promoting direct contact with nature, and developing supportive policies, while also pointing to the need for future longitudinal and mixed-methods research.

The outcomes of environmental upbringing extend across cognitive, attitudinal, behavioral, and developmental dimensions. Participants emphasized that children not only internalize environmental values but also use these principles as decision-making criteria in adolescence and adulthood. In conclusion, this study demonstrates that fostering pro-

environmental behaviors in children requires holistic attention to family practices, individual attitudes, and societal structures, emphasizing the essential role of psychology in addressing environmental challenges. By connecting environmental exposure, value internalization, and behavioral outcomes, these findings provide actionable insights for educators, policymakers, and parents seeking to cultivate sustainable behaviors in the next generation.

To achieve this, educational initiatives should organize hands-on activities such as gardening, tree planting, nature field trips, and environmental projects that actively engage children and foster environmental identity, as well as embed environmental concepts in various subjects while promoting positive attitudes and responsibility toward the environment.

Despite offering valuable insights, this study has several limitations that should be acknowledged. First, the research was conducted exclusively in Iran, with participants residing in Tehran. As a result, the findings may not be fully generalizable to other cultural or geographical contexts, where environmental attitudes, policies, and parent–child dynamics may differ. Second, the qualitative design—while well suited for exploring lived experiences—does not allow for statistical generalization. The absence of a mixed-methods approach, such as integrating survey-based quantitative data, limits the ability to triangulate findings and assess their prevalence across larger populations. Finally, the reliance on self-reported narratives may be influenced by social desirability bias, as participants may have presented their attitudes and behaviors in a more favorable light. Future research would benefit from adopting multi-site, cross-cultural, and mixed-methods designs to strengthen the validity and applicability of the results.

«مقاله پژوهشی»

عوامل موثر بر رفتار والد-کودک حامی محیط زیست: یک مطالعه کیفی

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چکیده

بحران زیست محیطی یک مسئله حیاتی برای نسل های کنونی و آینده است که پژوهش ها را به سمت بررسی عوامل کلیدی که افراد را از سنین پایین به مشارکت در رفتارهای طرفدار محیط زیست برمی انگیزد، می کشاند. بنابراین پژوهش حاضر با هدف بررسی عمیق زمینه ها و عوامل مرتبط با رفتار والد-کودک طرفدار محیط زیست، با رویکرد کیفی تحلیل مضمون انجام شد. در این مطالعه، ۱۵ مشارکت کننده (والدین، اعضای انجمن های دوستدار محیط زیست و روان شناسان تربیتی) از طریق نمونه گیری هدفمند تا اشیاع اطلاعات، در مصاحبه های نیمه ساختاریافته شرکت کردند. داده ها با استفاده از نرم افزار MAXQDA 2024 تحلیل گردید. برای اطمینان از صحت یافته ها، معیارهای اعتبارپذیری، اعتمادپذیری، تاییدپذیری و انتقال پذیری رعایت شد. یافته های پژوهش حاضر، از طریق تحلیل مضمون مصاحبه ها، شش مقوله اصلی شامل «تأثیرات محیطی بر ابعاد روانشناختی و تعاملات والد-کودک»، «تعین کننده های چندسطحی رفتار محیط زیستی والد-کودک»، «فرایندهای یادگیری و انتقال رفتار محیط زیستی»، «درونی سازی ارزش ها و هویت محیط زیستی»، «راهبردها و مداخلات تربیتی» و «پیامدهای تربیت محیط زیستی» را شناسایی کردند که به طور جامع، زمینه ها و عوامل مرتبط با رفتار والد-کودک طرفدار محیط زیست را تبیین می نمایند. یافته ها بر نقش حیاتی محیط بر بهزیستی روانشناختی، تأثیر عوامل چندسطحی (فردی، خانوادگی، اجتماعی)، فرایندهای یادگیری مشاهده ای و تجربی، و درونی سازی هویت محیط زیستی در انتقال این رفتارها تأکید دارند. این مطالعه لزوم طراحی مداخلات تربیتی مشارکتی و عملی، ترویج تماس مستقیم با طبیعت، و توسعه سیاست گذاری های حمایتی را برجسته ساخته و بر نیاز به پژوهش های طولی و ترکیبی آتی اشاره دارد.

واژه های کلیدی

رفتار والد-کودک، رفتار طرفدار محیط زیست، تحلیل محتوا.

Introduction

In the 21st century, the sustainability of the planet is facing unprecedented environmental challenges. Issues such as climate change, deforestation, pollution, and biodiversity loss are increasing at an alarming rate (Masson-Delmotte et al., 2021; Fletcher et al., 2024). These problems largely stem from human behaviors that have transformed ecosystems at an unparalleled pace (Liu & Green, 2024). In response to this crisis, academic research has emphasized the necessity of behavioral change at all levels—from communities and organizations to individuals (Bleidorn et al., 2021). These behavioral changes, aimed at preserving and improving the environment, are known as “pro-environmental behaviors” and encompass a wide range of actions such as energy conservation, recycling, reducing car use, and composting (Jia & Hui, 2021). In the psychological literature, this concept has also been referred to by terms such as environmental concern behavior (Axelrod & Lehman, 1993), significant environmental behavior (Stern, 2000), responsible environmental behavior (Tergesen, 2006), ecological behavior (Kaiser & Kutscher, 2003), and sustainable behavior (Clayton et al., 2016).

Among the strategies to address these challenges, instilling pro-environmental values and behaviors in children is of vital importance. Children are not only the primary stakeholders of a sustainable future, but they also have a high potential for adopting and modeling positive environmental behaviors (Prévot, Clayton, & Mathevet, 2018). Research indicates that children who participate in environmental education and outdoor experiences are more likely to develop a lifelong commitment to environmental protection (Chawla, 1999). The United Nations, through the Sustainable Development Goals (SDGs) for 2030, emphasizes empowering youth to take action toward a more sustainable future (Canton, 2021; Liu & Kaida, 2024). In this context, the role of parents in fostering environmental awareness and responsibility in children is central. Early childhood experiences and the values instilled by parents significantly shape children's attitudes toward the environment (Kahn, 1997).

Family dynamics play a crucial role in shaping children's environmental attitudes and behaviors, as the family functions as a primary agent of socialization where values, beliefs, and norms are transmitted (Ferguson & Snell, 2024). Studies have shown that parental attitudes toward the environment significantly influence children's perceptions and actions (Duarte et al., 2017). For instance, when parents model pro-environmental behaviors such as energy conservation, waste reduction, or participating in community clean-ups, children are more likely to adopt similar behaviors (Collado et al., 2017; Liang et al., 2022; Jia & Yu, 2021). This process of socialization, influenced by caregivers, supports the development of identity and the internalization of pro-environmental attitudes and behaviors in children (Ferguson & Snell, 2024). According to Social Learning Theory (Bandura & Walters, 1977), children acquire socially desirable values by observing and imitating the behaviors of significant others, especially parents. In this regard, the importance of parental modeling—particularly maternal modeling—has been confirmed by research, showing that children whose mothers exhibit pro-environmental attitudes are more likely to display similar behaviors in adolescence (Evans et al., 2018). This evidence suggests that children's pro-environmental behaviors are influenced by the dominant family norms and the extent to which these norms are modeled through parental behavior (Bartolo et al., 2023). Moreover, studies have shown that this relationship is bidirectional: children can also influence their parents' environmental choices, especially in Asian contexts where children may act as catalysts for change within the family (Liu & Kaida, 2024).

In addition to the role of the family, other factors also influence children's pro-environmental behaviors. Interventions through environmental education programs in schools and other institutions have been repeatedly examined for their effectiveness in promoting such behaviors among children (Boudet et al., 2016; Happonen, 2024). Children's contact with nature is another significant factor; frequent exposure to nature—whether direct or indirect—is associated with pro-environmental behaviors

through children's environmental attitudes and can enhance their mental health and positive social behaviors (Collado & Corraliza, 2015; Pirchio et al., 2021). Moreover, individual psychological factors such as *locus of control* also play a role; individuals with an internal locus of control, who believe they can make a difference through their actions, tend to behave more responsibly toward the environment (Weimer et al., 2017). Demographic factors such as age, gender, and socioeconomic background also influence children's environmental behaviors, although research findings in this area are sometimes inconsistent (Galli et al., 2013; Schumm & Bunger, 2016).

Qualitative studies in Iranian and Asian contexts have explored strategies for environmental education in early childhood (particularly under the age of four) (Mousavi et al., 2024), preschool children's environmental attitudes (Meybodi et al., 2015), and the factors influencing pro-environmental practices in urban settings (Mirhashemi, et al., 2020). However, most of these works have primarily emphasized educational environments or children's attitudes, while less attention has been given to how family interactions—particularly the role of parents—and everyday family experiences qualitatively shape children's pro-environmental behaviors within the specific cultural and social contexts of Iran.

Despite the vital importance of pro-environmental behaviors and the central role of the family in their formation, there remains a need for deeper understanding of the *contexts and factors* associated with parent-child pro-environmental behavior. While numerous quantitative studies have attempted to identify factors promoting pro-environmental behavior (Giancola et al., 2023), they often remain at a general level and focus primarily on correlational relationships. These approaches may be limited in revealing *how* and *why* complex interactions between these factors unfold within real family settings and the specific dynamics of the parent-child relationship. For instance, despite evidence of parental influence on children's environmental behaviors, there is still limited understanding of how children's thoughts, feelings, and actions related to environmental protection develop in

this context (Jia & Yu, 2021). Furthermore, some studies have shown inconsistent findings regarding the role of mothers in transmitting conservation behaviors (Schumm & Bunger, 2016), adding to the complexity of this process.

The intergenerational transmission of pro-environmental behavior is a powerful phenomenon in which ecological knowledge, attitudes, norms, values, and behaviors are passed from parents to children (Giancola et al., 2024; Liu & Green, 2024). However, existing research has mainly focused on the transmission of general values rather than specific ecological ones (Scopelliti et al., 2022). A more precise understanding of how this transmission influences children—and the development of educational programs and policies that support community initiatives aimed at promoting greater environmental awareness in children—requires further in-depth investigation (Ding et al., 2024). Additionally, although some studies have identified similarities between parent and child in environmental attitudes and behaviors (Liu & Kaida, 2024; Leppänen et al., 2012), these studies often emphasize linear relationships and may not fully capture the *subtle mechanisms* and *interactive dynamics* within families that contribute to the sustainability, evolution, or persistence of specific pro-environmental practices over time (Collado et al., 2019).

Given the complex and multifaceted nature of pro-environmental behaviors and the interplay of personal, social, and familial factors, there is a growing need for alternative and more in-depth research approaches. A qualitative study using content analysis can provide richer insights into the lived experiences of parents and children, their perceptions of influencing factors, and how these factors interact within the family context. This approach is particularly suited to uncovering the *contexts* and *hidden factors*, as well as the subtle interactions that are often not identifiable through quantitative studies. Therefore, the present study was conducted with the aim of deeply exploring the contexts and factors related to parent-child pro-environmental behavior through a qualitative content analysis. Although prior research has largely examined parent-child pro-

environmental behavior through quantitative and correlational approaches, leaving a gap in understanding the nuanced, context-specific, and interactive family dynamics that shape children's ecological attitudes and practices—this study seeks to address this gap through qualitative content analysis.

Research Methodology

The present study follows an interpretive (constructivist) paradigm and employs a qualitative (inductive) approach. The research strategy is content analysis, since many qualitative researchers believe that knowledge about human beings can only be obtained through descriptions of human experiences as they are directly recounted by the individuals themselves. In this context, phenomenology is recognized as an appropriate method for a deep understanding of experiences and for capturing the meanings of complex, multidimensional concepts (Burns et al., 2022). The researcher's aim, within this approach, is to grasp the meaning of the experience exactly as the participant has lived it.

The participants included parents, members of pro-environmental organizations, and educational psychologists. Sampling was conducted purposively until information saturation was achieved, concluding with 15 participants. Inclusion criteria—based on qualitative research standards—were having experience related to the phenomenon under study, willingness to collaborate with the researcher, and the ability to provide relevant information. Exclusion criteria included any reason for a participant to discontinue cooperation.

Inclusion and Exclusion Criteria: Participants were selected purposively according to qualitative research standards. Inclusion criteria consisted of being a parent with at least one child of preschool or primary school age, having active membership in or collaboration with pro-environmental organizations for at least one year, or possessing professional experience in educational psychology related to child development or environmental education. Additional requirements included the ability to articulate experiences clearly, provide relevant information for the study, and the willingness

to participate voluntarily with informed consent. Exclusion criteria involved withdrawal of consent at any stage, inability to attend interview sessions or allocate sufficient time for data collection, communication difficulties preventing meaningful contribution, or the presence of any conflict of interest that could bias the information provided.

To collect demographic information (such as age, gender, education level, place of residence, marital status, number of children, and occupation), a demographic checklist was employed. Data were gathered through semi-structured interviews using several open-ended questions such as: “What is the family's role in raising children?”; “How can the family teach children to respect the environment?”; and “What impact can respect for the environment have on children's upbringing?” In addition, probing questions like “Why?”, “How?”, and “Please explain more” were used during the interviews.

In order to enhance confidence in the accuracy of qualitative findings, the researchers paid attention to concepts such as credibility and dependability. To strengthen qualitative data, attention must be given to credibility, reliability, confirmability, and transferability (Merriam & Grenier, 2019). Below, these concepts are defined and the ways in which they were applied in the present study are detailed. Data collection continued until data saturation was reached, which occurs when additional data no longer yield new information or concepts. After each interview, data were coded and analyzed, and it was observed that themes and patterns were repeating. Once no novel insights emerged, data collection was concluded, ensuring the trustworthiness and credibility of the findings.

Credibility (Internal Validity): To ensure credibility, the researcher spent substantial time with participants and their data, reviewing each interview multiple times to capture all relevant details. Member checking was conducted via in-person or telephone contact, allowing participants to confirm interpretations and clarify ambiguous statements. Triangulation was applied by including participants with diverse characteristics (e.g., gender, age, socioeconomic status), ensuring that findings reflected multiple perspectives.

Transferability (External Validity): To support transferability, the study context, participants' characteristics, and research procedures were described in detail. Sample excerpts from interview transcripts were provided as illustrative examples, allowing readers to evaluate whether the findings can apply to similar contexts.

Dependability (Reliability): Dependability was ensured through careful data recording and coding. A random 20% of semantic units were re-coded after a set interval (stability/ test–retest reliability) to verify consistency over time. Additionally, independent coders applied the coding scheme to a portion of the data (reproducibility/ intercoder reliability), and agreement rates were calculated to confirm coding stability.

Confirmability (Objectivity): To enhance confirmability, the researcher carefully avoided personal biases during data collection and analysis, documenting all decisions at every stage. The findings were reviewed by five professors specializing in the study topic to provide feedback and verify that interpretations were grounded in the data rather than researcher assumptions.

Data Collection Tool: Data were collected through **semi-structured interviews**, which allowed for in-depth exploration of participants' experiences while providing flexibility to probe emerging topics. A total of four open-ended questions were developed, based on the literature on parent-child interactions and pro-environmental behaviors, to capture both the general perspectives and specific practices of parents. Example questions included:

1. "Can you describe how you involve your child in environmentally friendly activities at home?"
2. "What factors influence your decision to encourage or discourage your child's pro-environmental behavior?"
3. "Can you share an experience where your child responded positively or negatively to your environmental guidance?"
4. "How do you balance environmental concerns with other parenting priorities?"

Follow-up and probing questions were used to clarify responses and gain deeper insights into parents' motivations, attitudes, and perceived barriers related to pro-environmental behavior. Interviews lasted between 45 and 75 minutes and were conducted in a location convenient for participants, either in person or via telephone, depending on participant preference. All interviews were audio-recorded with participants' consent and later transcribed verbatim for analysis.

This approach ensured rich, detailed data that reflected the lived experiences of parents and allowed the research team to identify key themes and factors associated with parent-child pro-environmental behavior.

For data analysis and to identify core implications, thematic analysis was employed. To better document the interviews, and to organize, summarize, and synthesize the raw data, MAXQDA 2024 software was used.

Research Findings

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 15 participants, 10 were married, 1 was single, and 4 were divorced/widowed. Among the five 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 the interviews with 15 participants were subjected to thematic analysis, ultimately leading to the identification of six main themes and 16 sub-themes.

Table 1. The Coding Process to Achieve Main Categories

Initial Code	Sub-theme	Main Theme
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	Emotional Effects and Psychological Well-being	Environmental Impacts on Psychological Dimensions and Parent-Child Interactions
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	Dynamics and Quality of Family Relationships	
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	Cognitive Growth and Individual Skills	
Environmental knowledge and awareness, Individual aesthetics, Parents' positive/negative attitudes toward the environment (pro-environmental/indifferent/profit-oriented)	Individual and Psychological Factors	Multi-level Determinants of Parent-Child Pro-Environmental Behavior
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	Family and Upbringing 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)	Social and Institutional Factors	
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	Observational Learning and Modeling	
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	Communication and Verbal Interactions	Learning Processes and Transmission of Environmental Behavior
Participation in environmental events and activities, Collective family activities (clean-ups, planting, recycling), Raising plants and animals, Excursions in nature, Symbolic actions (waste segregation, turning off lights/water), Competitions and games, listening to nature, Practical experience and answering questions, Acquiring vital skills	Experiential and Participatory Learning	
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	Internalization of Values and Environmental Identity	

Initial Code	Sub-theme	Main Theme
Collective environmental reading and book clubs, Storytelling, Watching environmental films and animations, Proper environmental education for students	Educational and Cultural Strategies	Educational Strategies and Interventions
Environmental reward system, Environmental punishment system, Socio-emotional rewards for respecting nature	Motivational and Reinforcement 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	Activation and Empowerment Strategies	
Changing and deepening children's attitudes, Increased environmental awareness, Averting indifference, Creating environmental appeal, Initial exposure to environmental challenges	Cognitive and Attitudinal Outcomes	Outcomes of Environmental Upbringing
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	Behavioral and Ethical Outcomes	
Impact on future career path and responsibility, Reduction of mental disorders in the new generation (long-term mental health outcome)	Developmental and Long-term Outcomes	

Main Theme 1: Environmental Impacts on Psychological Dimensions and Parent-Child Interactions

This theme highlights the vital role of the environment in mental health, emotional well-being, and the quality of intra-family relationships.

1. Emotional and Psychological Well-Being: The findings indicated that a clean and natural environment positively affects emotional well-being and psychological health. Participants reported experiencing peace, happiness, mental balance, and reduced stress for themselves and their children when in contact with nature. 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." Participant #8 commented: "A polluted environment feels soul-eroding. My children and I feel calmer and happier when we are in a clean and natural setting." Participant #11 added: "Even a short walk in the park lifts our mood. I notice that my child is calmer and more patient after spending time outdoors."

2. Quality of Family Interactions and Parent-Child Relationships: Nature also strengthens family bonds by increasing positive interactions, reducing tensions, and creating

safe and peaceful spaces. Participant #6 mentioned: "Spending time in nature gives us more opportunities to talk and play. We laugh together more, and our connection feels deeper." Participant #12 noted: "Conflicts between my children decrease when we are outdoors. They seem to support each other more and cooperate during play." Participant #9 explained: "Family activities in a natural environment, like gardening or hiking, help us communicate better and solve small disputes calmly."

Participants noted that economic conditions and social structures significantly influenced parent-child pro-environmental behaviors. For example, Participant #5 stated: "*Sometimes we want to take the children to parks or buy eco-friendly products, but high costs and limited affordable options make it difficult. We try, but our choices are restricted by our income.*" Similarly, Participant #9 emphasized the role of social norms and community: "*In our neighborhood, people do not usually separate waste or care for green spaces. It's hard to teach children when society around us doesn't support it.*"

These insights reveal that **economic constraints can limit families' capacity to engage in environmentally positive behaviors**, while social norms and communal

practices shape children's observational learning and value internalization. In other words, even when parents are motivated, **structural and societal factors**—such as affordability, local infrastructure, and peer behavior—mediate the translation of values into actual behavior.

It is important to note that these findings reflect the experiences of parents primarily residing in Tehran, a large urban center with specific socioeconomic characteristics. Families in smaller cities or rural areas may face different economic challenges, opportunities for nature-based activities, and social norms, potentially affecting the generalizability of the results. Recognizing this **contextual limitation** helps situate the findings within Tehran's urban environment while informing future research in diverse cultural and geographical settings.

3. Cognitive Growth and Individual Skills: Participants emphasized nature's role in fostering curiosity, creativity, and problem-solving skills in children.

Participant #2 “When children ask questions about plants, animals, or weather, they try to find answers themselves, which strengthens their thinking skills.” Participant #4 added: “Hands-on experience in nature teaches lessons much better than reading from a book. My child remembers and understands more when we explore together.” Participant #10 stated: “Nature encourages my child to be creative. We build, invent games, and think of solutions together, which I don't see happening at home as much.”

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 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, Participant #9 observed: “Children notice when we waste resources, so our actions must be consistent.” 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 #15 deemed policies and infrastructure important in facilitating correct environmental behaviors. Participant #14 “Community parks and local recycling programs help children understand that environmental responsibility is not only a family issue but a societal one too.”

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** were identified as among 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, talk with elements of nature, teach in the child's presence, and explain 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, and 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. Participant #13 "By discussing the consequences of pollution and showing how actions affect nature, my child starts to internalize these values and acts thoughtfully, even when unsupervised."

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 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. Participant #11 also pointed to the institutionalization of correct behaviors in children. Participant #9 added: “My child now actively encourages friends and family to take care of the environment; these behaviors have become a natural part of their daily routine.”

Conclusion

This qualitative study, using thematic analysis, explored the backgrounds and factors associated with pro-environmental parent-child behavior. Interviews with 15 participants (including parents, environmental advocates, and educational psychologists) led to the identification of **six core categories and sixteen subthemes**, revealing the complexity of this phenomenon.

The findings not only support existing theoretical concepts but also offer deeper insight into lived experiences and the

interaction of family and societal factors—areas often limited to correlational insights in quantitative studies.

Given the lack of comprehensive reviews on children’s pro-environmental behavior (Liu & Green, 2024), this study contributes a holistic picture of current knowledge and underscores the importance of psychology’s role in addressing environmental challenges (Clayton et al., 2016; Nielsen et al., 2021).

The first core category, **“Environmental Influences on Psychological Dimensions and Parent-Child Interactions,”** highlighted nature’s role in emotional well-being and relationship quality. Subthemes included emotional impacts, family dynamics, and cognitive development. These results align with environmental psychology, emphasizing “contact with nature” as crucial to mental health (Kahn, 1997). Liu and Green (2024) stress that early childhood experiences in nature deeply influence emotional bonding with nature, fostering pro-environmental behaviors and even career choices in adulthood (Asah et al., 2012; Chawla, 1999; Wells & Lekies, 2006). Stronger connections with nature also predict greater pro-environmental behavior and psychological well-being (Pirchio et al., 2021). Thus, facilitating access to nature is not only key to environmental education but also to family bonding and child development (Collado & Corraliza, 2015).

The second category, **“Multilevel Determinants of Environmental Behavior in Parent-Child Dynamics,”** detailed the individual, family, and societal factors that influence such behaviors. Subthemes included personal knowledge, attitudes, family values, parental responsibility, and social structures like education, media, and policy. These findings align with theoretical frameworks such as the **Value-Belief-Norm Theory** (Stern, 2000) and the **Theory of Planned Behavior** (Ajzen, 1991; Kaiser & Gutscher, 2003), both cited by Liu & Green (2024). These frameworks underscore the role of internal drivers (personal norms, self-efficacy, attitudes) and external influences (parents, teachers, society) in shaping behavior. The emergence of “parental responsibility” and “congruence of words and actions” in this study echoes Liu and Green’s (2024) emphasis on the modeling role of parents. Moreover, the

importance of **self-perception and identity** (Liu & Green, 2024) and **social labeling** aligns with this study's findings on children's environmental self-identity.

Notably, participants described enhanced emotional balance, reduced stress, and improved family interactions, reinforcing the notion that access to natural settings fosters both individual psychological resilience and positive parent-child dynamics. While Liu & Green (2023) similarly report that early nature experiences shape children's emotional bonding with the environment, our findings extend this by illustrating practical mechanisms, such as structured family activities and cognitive engagement with natural environments, that facilitate these outcomes.

Regarding the multi-level determinants of pro-environmental behavior, our study confirms that individual, family, and social factors interact synergistically. Parental awareness, consistent modeling of behaviors, and early exposure to environmental values were pivotal, corroborating Chawla's (1999) assertion that family practices are foundational to environmental identity formation. In contrast to some quantitative studies that focus primarily on individual knowledge or attitudes, our findings underscore the dynamic interplay between personal, familial, and societal influences, suggesting that interventions targeting only one level may have limited impact.

The internalization of values and environmental identity observed in participants' children supports Asah et al.'s (2012) findings that early engagement fosters lasting environmental identity and prosocial behavior. However, our study adds nuance by showing how children's perception of nature as a "protective entity" contributes to empathy, kindness, and ethical reasoning—elements not always captured in survey-based research.

Finally, the outcomes of environmental upbringing extend across cognitive, attitudinal, behavioral, and developmental dimensions. Participants emphasized that children not only internalize environmental values but also use these principles as decision-making criteria in adolescence and adulthood. This supports

Wells & Lekies (2006) and Liu et al. (2022) regarding the predictive role of childhood nature experiences on long-term pro-environmental behavior and psychological well-being. Moreover, our study highlights potential public health implications, including reduced stress and mental disorders among the next generation, an aspect less explored in prior literature.

While our findings resonate with existing studies, the qualitative design allowed for rich, contextualized understanding of processes that quantitative methods might overlook. Nevertheless, the sample size and specific sociocultural context may limit generalizability. Future research could adopt mixed-method approaches, combining in-depth qualitative insights with larger-scale quantitative validation, to further clarify causal pathways and cross-cultural applicability.

In conclusion, this study demonstrates that fostering pro-environmental behaviors in children requires holistic attention to family practices, individual attitudes, and societal structures, emphasizing the essential role of psychology in addressing environmental challenges. By connecting environmental exposure, value internalization, and behavioral outcomes, these findings provide actionable insights for educators, policymakers, and parents seeking to cultivate sustainable behaviors in the next generation.

Although gender and age were not the primary focus of this study, comparative analysis of the interviews revealed several noteworthy patterns.

Gender differences. Mothers tended to emphasize the *emotional* and *nurturing* aspects of environmental experiences, often linking nature to children's emotional regulation, empathy, and family bonding. Fathers, in contrast, more frequently highlighted *responsibility, discipline, and practical behaviors*, such as waste reduction or sustainable consumption. These differences suggest that both maternal and paternal perspectives contribute complementarily to shaping children's pro-environmental identities, with mothers strengthening the affective dimension and fathers reinforcing behavioral modeling.

Age differences. Parents of younger children (under 10 years) described greater reliance on *experiential learning*, such as play and exploration in natural settings, as an entry point to fostering curiosity and environmental awareness. In contrast, parents of adolescents emphasized the role of *discussion, reasoning, and shared decision-making*, particularly in connecting environmental values to future goals, social responsibilities, and career considerations. Younger children were perceived as more receptive to environmental values through direct experience, while older children required deeper cognitive engagement to sustain pro-environmental commitment. These gendered and age-specific dynamics highlight the need for tailored strategies in environmental education: programs for younger children should focus on experiential and play-based approaches, while interventions for adolescents should emphasize critical thinking, identity formation, and ethical reasoning. Furthermore, recognizing the complementary contributions of mothers and fathers may help design family-centered initiatives that maximize the intergenerational transfer of environmental values.

Limitations

Despite offering valuable insights, this study has several limitations that should be acknowledged. First, the research was conducted exclusively in Iran, with participants residing in Tehran. As a result, the findings may not be fully generalizable to other cultural or geographical contexts, where environmental attitudes, policies, and parent-child dynamics may differ. Second, the qualitative design—while well suited for exploring lived experiences—does not allow for statistical generalization. The absence of a mixed-methods approach, such as integrating survey-based quantitative data, limits the ability to triangulate findings and assess their prevalence across larger populations. Finally, the reliance on self-reported narratives may be influenced by social desirability bias, as participants may have presented their attitudes and behaviors in a more favorable light. Future research would benefit from adopting multi-site, cross-cultural, and mixed-methods designs to strengthen the validity and applicability of the results.

Practical Recommendations Based on Multilevel Determinants of Parent-Child Environmental Behavior

1. Recommendations for Policymakers:

Enhance environmental infrastructure and access to nature: Develop parks, green spaces, and environmental education centers near residential areas to facilitate direct nature experiences for children and families.

Implement supportive and incentivizing policies: Establish laws and programs that encourage pro-environmental behaviors in schools and households, such as recycling initiatives, environmental campaigns, and public education programs.

Promote cross-sector collaboration: Coordinate efforts between ministries of education, health, and environment to design multilevel programs addressing individual, family, and societal influences.

2. Recommendations for Schools and Educational Institutions:

Experiential and participatory learning: Organize hands-on activities such as gardening, tree planting, nature field trips, and environmental projects that actively engage children and foster environmental identity.

Integrate environmental education across curricula: Embed environmental concepts in various subjects while promoting positive attitudes and responsibility toward the environment.

Encourage parental involvement: Invite parents to participate in school activities and environmental projects alongside their children to reinforce parental modeling.

3. Recommendations for Parents:

Model pro-environmental behaviors: Demonstrate eco-friendly behaviors in daily life, as children learn through the observation of parental actions.

Ensure congruence between words and actions: Align everyday practices with the environmental messages conveyed to children.

Create positive and engaging experiences: Provide opportunities for play and interaction with nature in fun and educational ways, fostering intrinsic

motivation and environmental responsibility.

Encourage curiosity and dialogue:

Respond to children's questions about nature and encourage exploration and problem-solving in natural settings to strengthen cognitive skills and environmental self-identity.

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Conflict of Interest

As declared by the authors, there is no conflict of interest to report for this article.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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