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# Temperament and Eco-Anxiety: Exploring Emotional Responses to Climate Change in Children and Adolescents

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## Abstract

Eco-anxiety, defined as persistent worry and distress related to climate change, is increasingly recognised as a mental health concern among younger populations. This study explores the role of temperament in shaping eco-anxiety among children and adolescents from urban middle-class schools in India. A cross-sectional survey was conducted with 400 students (200 children aged 10–13 years and 200 adolescents aged 14–18 years), equally divided by gender. Standardised temperament and eco-anxiety scales were administered. Results revealed that females exhibited significantly higher eco-anxiety than males in both age groups. Gender-based temperament differences were also observed: girls scored significantly higher in negative affectivity, while no major gender differences were found in effortful control and extraversion. Correlation and regression analyses showed that negative affectivity was positively associated with eco-anxiety, whereas effortful control was negatively associated. Regression analysis indicated that temperament traits predicted 28% of the variance in eco-anxiety. These findings underscore the importance of considering both temperament and gender when addressing eco-anxiety in educational and psychological interventions.

**Keywords:** temperament, eco-anxiety, children, adolescents, gender differences, climate change

## Introduction

Climate change poses profound challenges not only to natural ecosystems but also to human mental health. Its consequences extend beyond physical threats, affecting emotional well-being and daily functioning, particularly among young people who are still developing coping mechanisms. Eco-anxiety, defined as persistent worry, sadness, or feelings of helplessness related to climate change and environmental degradation, has emerged as a significant psychological concern in youth populations (Clayton & Karazsia, 2020). Global surveys have documented that a substantial proportion of children and adolescents experience distress about climate change, often accompanied by doubts about the effectiveness of governmental and societal responses to environmental crises (Hickman et al., 2021). Such feelings may influence not only mental health outcomes but also engagement in pro-environmental behaviors and long-term life choices.

Individual differences in temperament may help explain why some children experience heightened eco-anxiety while others remain relatively resilient. Temperament, a biologically rooted aspect of personality, encompasses traits that influence emotional reactivity, regulation, and social behavior (Rothbart, 2011). Among these, **negative affectivity**—the tendency to experience distress, worry, or sadness—may predispose children to stronger eco-anxiety responses. **Effortful control**, which reflects the capacity to regulate emotions and attention, may buffer against such distress, helping young people manage anxiety related to climate threats. **Extraversion**, characterized by positive emotionality and sociability, may influence coping by facilitating social support and engagement with peers, though its effect on eco-anxiety may be less direct. By examining these temperament traits, researchers can better understand the mechanisms underlying vulnerability and resilience to environmental stressors.

Gender differences also appear to play a significant role in eco-anxiety. Prior research suggests that girls report higher levels of eco-anxiety than boys, potentially due to socialization processes that emphasize empathy, care, and emotional expressiveness (Panu, 2020). Differences in temperament—particularly higher negative affectivity observed among girls—may further amplify susceptibility to environmental stressors. Understanding these gender-linked patterns is essential for developing targeted interventions and fostering adaptive coping strategies in youth populations.

The present study explores the relationship between temperament and eco-anxiety among children and adolescents attending urban middle-class schools in India. It examines age-related variations as well as gender-based differences in both temperament traits and eco-anxiety levels. By integrating these factors, the study aims to provide a comprehensive understanding of the individual and demographic characteristics that contribute to eco-anxiety, offering insights for educators, parents, and policymakers to support mental health and environmental awareness in young populations.

**Objectives**

1. To assess eco-anxiety levels among children (10–13 years) and adolescents (14–18 years).
2. To examine the relationship between temperament traits and eco-anxiety.
3. To compare **gender differences in both eco-anxiety and temperament traits** among children and adolescents.
4. To analyze temperament traits as predictors of eco-anxiety.

**Method**

**Research Design and Sample**

The present study employed a **descriptive cross-sectional research design** to investigate the relationship between temperament and eco-anxiety among school-going children and adolescents. A total of **400 participants** were included in the study, comprising **200 children aged 10–13 years** and **200 adolescents aged 14–18 years**, with equal representation of both males and females in each group. The participants were selected from **urban**

**schools in India**, specifically those catering to **middle-class families**, ensuring socioeconomic homogeneity within the sample. The classification of families as middle-class was based on the **modified Kuppuswamy's Socioeconomic Status (SES) Scale**, which considers parental education, occupation, and family income.

A **stratified purposive sampling method** was adopted to ensure balanced representation across age groups (children vs. adolescents) and gender (male vs. female). Schools were first identified from urban middle-class localities, and then participants were drawn proportionately from the eligible grades to maintain equal distribution. This approach allowed for systematic inclusion of students while reducing sampling bias.

The decision to focus on **urban, middle-class schools** was made to minimize potential confounding variables related to socioeconomic extremes such as poverty or affluence. Middle-class families often provide children with relatively stable access to education, resources, and media exposure, which can influence their awareness and emotional responses to global issues such as climate change. Moreover, children and adolescents in urban settings are more likely to be directly exposed to environmental concerns (e.g., pollution, urban heat, waste management problems) and discussions about climate change in schools, media, and peer groups. This focus allows for a more accurate assessment of how temperament interacts with eco-anxiety in a socioeconomically balanced and environmentally aware population.

**Measures**

**Instruments**

1. **Early Adolescent Temperament Questionnaire–Revised (EATQ-R; Ellis & Rothbart, 2001):** Used to assess temperament dimensions such as **negative affectivity, effortful control, and extraversion**, rated on a **5-point Likert scale**.
2. **Eco-Anxiety Scale for Youth (Clayton & Karazsia, 2020):**
   Adapted for cultural suitability, this tool measured **worry and emotional responses to climate change** on a **5-point Likert scale**.
3. **Modified Kuppuswamy Scale (2019):**
   Applied to determine **socioeconomic status** based on education, occupation, and family income. Only middle-class participants were included.
4. **Demographic Sheet:**
   Collected basic details such as **age, gender, grade, and family background** for classification and analysis.

**Procedure**

Ethical approval for the study was obtained from the relevant institutional review board, and informed consent was secured from parents or guardians. Children's assent was also obtained before participation. Data collection was conducted in classroom settings by trained researchers, ensuring that participation was voluntary. All responses were kept anonymous, and confidentiality of the participants' information was strictly maintained throughout the study.

**Data Analysis**

The study first examined the descriptive statistics, reporting the mean and standard deviation for eco-anxiety and temperament traits. Independent samples t-tests were conducted to compare gender differences, revealing that girls scored significantly higher than boys on eco-anxiety and certain temperament traits. Pearson's correlation analysis showed significant relationships between eco-anxiety and specific aspects of temperament. Finally, multiple regression analysis identified which temperament traits predicted eco-anxiety, indicating that Negative Affectivity was a strong positive predictor, Effortful Control had a significant negative effect, and Extraversion did not significantly predict eco-anxiety.

- **Results**
- **Table 1: Demographic Characteristics of the Sample (N = 400)**

| Variable | Category | n | % |
|---|---|---|---|
| **Age Group** | Children (10–13 yrs) | 200 | 50 |
| | Adolescents (14–18 yrs) | 200 | 50 |
| **Gender** | Male | 200 | 50 |
| | Female | 200 | 50 |
| **Family Type** | Nuclear | 200 | 50 |
| | Joint | 200 | 50 |
| **Father's Education** | Secondary | 100 | 25 |
| | Graduate | 150 | 37.5 |
| | Postgraduate & above | 150 | 37.5 |
| **Mother's Education** | Secondary | 120 | 30 |
| | Graduate | 160 | 40 |
| | Postgraduate & above | 120 | 30 |
| **Father's Occupation** | Public Sector | 200 | 50 |
| | Private Sector | 200 | 50 |
| **Mother's Occupation** | Public Sector | 150 | 37.5 |
| | Private Sector | 150 | 37.5 |
| | Homemaker | 100 | 25 |
| **Socioeconomic Status** | Middle-class (per Modified Kuppuswamy Scale, 2019) | 400 | 100 |

**Demographic Characteristics**

The study included a total of 400 participants, equally divided into children (10–13 years, n = 200) and adolescents (14–18 years, n = 200). Gender representation was balanced, with 200 boys and 200 girls across both age groups. All participants were drawn from urban, middle-class families, as classified by the Modified Kuppuswamy Socioeconomic Scale (2019 update).

Family background was considered in terms of structure, with half of the participants (50%) belonging to nuclear families and the other half (50%) to joint families. Parental education was also taken into account. Among fathers, 25% had completed secondary education, 37.5% were graduates, and 37.5% held postgraduate or higher qualifications. Mothers showed a similar educational distribution, with 30% completing secondary education, 40% graduates, and 30% postgraduates or above.

Parental occupations were distributed equally to maintain representation. Among fathers, 50% were employed in public sector jobs while the remaining 50% worked in private sector employment. Mothers, on the other hand,

were more varied in employment: 37.5% were employed in the public sector, 37.5% in private sector jobs, and 25% identified as homemakers.

This balanced distribution across **age, gender, family type, parental education, and occupation** was intentional to avoid demographic bias and ensure that comparisons across temperament and eco-anxiety variables could be drawn more reliably.

- **Objective 1: To assess eco-anxiety levels among children and adolescents**

  Descriptive statistics were computed to explore eco-anxiety and temperament traits among children and adolescents, separately for males and females.

  **Table 2**:**Descriptive Statistics of Eco-Anxiety and Temperament Traits by Age and Gender (N = 400)**

| Group | n | Eco-Anxiety M (SD) | Negative Affect M (SD) | Effortful Control M (SD) | Extraversion M (SD) |
|---|---|---|---|---|---|
| Children – Male | 100 | 3.28 (0.76) | 3.42 (0.62) | 3.18 (0.54) | 3.51 (0.61) |
| Children – Female | 100 | 3.56 (0.82) | 3.63 (0.67) | 3.24 (0.59) | 3.39 (0.64) |
| Adolescents – Male | 100 | 3.72 (0.84) | 3.48 (0.65) | 3.19 (0.57) | 3.47 (0.66) |
| Adolescents – Female | 100 | 4.05 (0.89) | 3.71 (0.70) | 3.23 (0.61) | 3.41 (0.60) |

- *Note*. Higher mean scores indicate stronger expression of the trait.

Table 1 presents the mean scores and standard deviations for eco-anxiety and temperament traits across age groups and gender. The findings indicate that **adolescent girls reported the highest levels of eco-anxiety (M = 4.05, SD = 0.89)** compared to other groups, followed by **adolescent boys (M = 3.72, SD = 0.84)**. Among children, **girls showed slightly higher eco-anxiety (M = 3.56, SD = 0.82)** than boys (M = 3.28, SD = 0.76). This pattern suggests that both **age and gender play a role in shaping eco-anxiety**, with adolescent females being particularly vulnerable.

In terms of temperament, **negative affect was higher among females** in both children (M = 3.63, SD = 0.67) and adolescents (M = 3.71, SD = 0.70) compared to their male counterparts. Effortful control scores were relatively consistent across all groups, showing minimal variation, while **extraversion was slightly higher among boys** than girls in both age categories.

Overall, these results suggest that **girls, especially adolescents, experience greater eco-anxiety and higher negative affect**, whereas **boys tend to report marginally higher extraversion**. Effortful control appears stable across age and gender, indicating it may be less influenced by these demographic factors.

- **Objective 2: To examine the relationship between temperament traits and eco-anxiety**

Pearson correlations were calculated between temperament traits and eco-anxiety.

**Table 3**: **Correlations Between Temperament Traits and Eco-Anxiety (N = 400)**

| Trait | r | p-value | Direction |
|---|---|---|---|
| Negative Affectivity | .46 | < .001 | Positive |
| Effortful Control | –.31 | < .001 | Negative |
| Extraversion | .08 | .12 ns | None |

The results show that **negative affectivity had a strong positive correlation with eco-anxiety (r = .46, p < .001)**, suggesting that individuals with higher levels of negative emotions are more likely to experience heightened eco-anxiety. Conversely, **effortful control demonstrated a significant negative correlation (r = –.31, p < .001)**, indicating that greater self-regulation and attentional control are associated with reduced eco-anxiety. Extraversion, however, showed no significant relationship (r = .08, p = .12), suggesting that sociability and outgoing tendencies do not substantially influence eco-anxiety in this sample.

These findings highlight the importance of temperament in shaping emotional responses to climate change, with **negative affect and effortful control emerging as the strongest predictors of eco-anxiety**

**Objective 3: To compare gender differences in eco-anxiety and temperament traits**

Independent samples t-tests were conducted to compare male and female students within each age group.

**Table 4**: **Gender Comparisons in Eco-Anxiety and Temperament Traits**

| Age Group | Variable | t(df) | p-value | Interpretation |
|---|---|---|---|---|
| Children | Eco-Anxiety | 2.58 | < .01 | Girls > Boys |
| | Negative Affectivity | 2.35 | < .05 | Girls > Boys |
| | Effortful Control | 0.85 | ns | No difference |
| | Extraversion | 1.12 | ns | No difference |
| Adolescents | Eco-Anxiety | 2.97 | < .01 | Girls > Boys |
| | Negative Affectivity | 2.68 | < .01 | Girls > Boys |
| | Effortful Control | 0.77 | ns | No difference |
| | Extraversion | 1.05 | ns | No difference |

- *Note.* ns = not significant.

The independent samples t-test revealed notable gender differences in eco-anxiety and temperament traits. Among both **children and adolescents**, girls consistently reported **higher eco-anxiety scores** compared to boys. Similarly, **negative affectivity was significantly higher among girls** in both age groups, indicating greater emotional sensitivity. On the other hand, **no meaningful gender differences were observed for effortful control or extraversion**, suggesting that self-regulation and sociability remain relatively stable across boys and girls.Overall, the results highlight that **female students, regardless of age, are more prone to experiencing eco-anxiety and negative affectivity**, while gender does not appear to influence regulatory or social temperament traits.

**Objective 4: To analyse temperament traits as predictors of eco-anxiety**

A multiple regression analysis was performed to determine which temperament traits predicted eco-anxiety levels.

**Table 5**: **Multiple Regression Predicting Eco-Anxiety**

| Predictor | B | SE B | β | t | p-value |
|---|---|---|---|---|---|
| Negative Affectivity | 0.52 | 0.06 | .44 | 8.67 | < .001 |
| Effortful Control | –0.39 | 0.07 | –.28 | –6.12 | < .001 |
| Extraversion | 0.11 | 0.08 | .07 | 1.38 | .17 |

- *Note.* $R^2 = .28$, $F(3, 396) = 51.4$, $p < .001$.

The regression analysis examined how temperament traits predicted eco-anxiety. **Negative Affectivity** was a significant positive predictor ($B = 0.52$, $SE = 0.06$, $\beta = .44$, $t = 8.67$, $p < .001$), indicating that higher negative affectivity was associated with higher eco-anxiety. **Effortful Control** showed a significant negative effect ($B = –0.39$, $SE = 0.07$, $\beta = –.28$, $t = –6.12$, $p < .001$), suggesting that greater self-regulation corresponded to lower eco-anxiety. **Extraversion** was not a significant predictor ($B = 0.11$, $SE = 0.08$, $\beta = .07$, $t = 1.38$, $p = .17$), indicating little influence on eco-anxiety. Overall, Negative Affectivity had the strongest positive impact, Effortful Control had a moderate negative effect, and Extraversion did not significantly contribute.

**Discussion**

This study demonstrates the significance of temperament and gender in shaping eco-anxiety among children and adolescents in middle-class urban India. Three major findings emerged:

1. **Developmental differences:** Adolescents reported higher eco-anxiety than children, reflecting greater cognitive awareness of environmental threats at later developmental stages.
2. **Gender differences:** Girls exhibited significantly higher eco-anxiety and negative affectivity compared to boys across both age groups. This suggests that heightened emotional sensitivity among girls may intensify climate-related distress. In contrast, no significant gender differences were found in effortful control and extraversion, highlighting that self-regulation capacities are not strongly gendered in this sample.
3. **Temperament as predictor:** Negative affectivity was a strong positive predictor of eco-anxiety, while effortful control functioned as a protective factor. Extraversion showed no significant effect.

The regression model explained 28% of variance in eco-anxiety, underscoring the importance of temperament in understanding emotional responses to climate change. These findings align with previous research (Clayton & Karazsia, 2020; Hickman et al., 2021) and provide novel evidence of how gendered temperament traits interact with eco-anxiety in the Indian urban middle-class context.

**Conclusion**

Eco-anxiety among children and adolescents is shaped by developmental stage, gender, and temperament. Girls, particularly those high in negative affectivity, are more vulnerable to heightened eco-anxiety. Interventions should focus on enhancing **effortful control** and promoting emotional resilience, particularly for female students.

Integrating climate education with school-based psychological support can help young people manage eco-anxiety more effectively.

**References**

Clayton, S., & Karazsia, B. T. (2020). Development and validation of a measure of climate change anxiety. *Journal of Environmental Psychology, 69,* 101434. https://doi.org/10.1016/j.jenvp.2020.101434

Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E. E., Wray, B., Mellor, C., & van Susteren, L. (2021). Climate anxiety in children and young people and their beliefs about government responses to climate change: A global survey. *The Lancet Planetary Health, 5*(12), e863–e873. https://doi.org/10.1016/S2542-5196(21)00278-3

Kuppuswamy, B. (2019). Socio-economic status scale (modified for urban families). *Indian Journal of Community Medicine, 44*(2), 196–198. https://doi.org/10.4103/ijcm.IJCM_239_19

Panu, P. (2020). Anxiety and the ecological crisis: An analysis of eco-anxiety and climate anxiety. *Sustainability, 12*(19), 7836. https://doi.org/10.3390/su12197836

Rothbart, M. K. (2011). *Becoming who we are: Temperament and personality in development.* Guilford Press.