

# Individual, Household, and Neighbourhood-Level Influences on Eco-Anxiety in the Generation XXI Birth Cohort

Ana Isabel Ribeiro<sup>1,2,3\*</sup>, Inês Morais Vilaça<sup>1,4</sup>, Ana Henriques<sup>1,2,3</sup>, Maria Pastor Valero<sup>5,6</sup>, Alícia Matijasevich<sup>7</sup>, Henrique Barros<sup>1,2,3</sup>

<sup>1</sup>EPIUnit - Instituto de Saúde Pública, Universidade do Porto, Rua das Taipas, nº 135, 4050-600 Porto, Portugal; <sup>2</sup>Laboratório para a Investigação Integrativa e Translacional em Saúde Populacional (ITR), Rua das Taipas, nº 135, 4050-600 Porto, Portugal; <sup>3</sup>Departamento de Ciências da Saúde Pública e Forenses e Educação Médica, Faculdade de Medicina, Universidade do Porto, Alameda Prof. Hernâni Monteiro, 4200-319 Porto, Portugal; <sup>4</sup>Unidade Local de Saúde de Gaia; <sup>5</sup>Department of Public Health, History of Science and Gynaecology, Faculty of Medicine, Miguel Hernandez University, Sant Joan d'Alacant, Alicante, Spain; <sup>6</sup>CIBER in Epidemiology and Public Health (CIBERESP), Madrid, Spain; <sup>7</sup>Departamento de Medicina Preventiva, Faculdade de Medicina FMUSP, Universidade de São Paulo, SP, Brazil

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Adolescents' eco-anxiety is emerging as a significant public health concern, driven by current and projected climate scenarios. Based on data from a Portuguese birth cohort, this study identifies key multi-level factors contributing to eco-anxiety, highlighting the influence of gender, mental health, information sources, and living near pollution.

## BACKGROUND

- Eco-anxiety, the **emotional response to environmental threats**, is a growing public health concern, especially in adolescents.
- This study identifies the multi-level factors associated with eco-anxiety in Portuguese adolescents.

## METHODS

**Study Design:** Cross-sectional analysis based on the **Generation XXI** birth cohort from the **Porto Metropolitan Area** in Portugal (n=8647). An **online survey** on eco-anxiety was conducted between **November 2022 and March 2023** with adolescents aged 16-18.

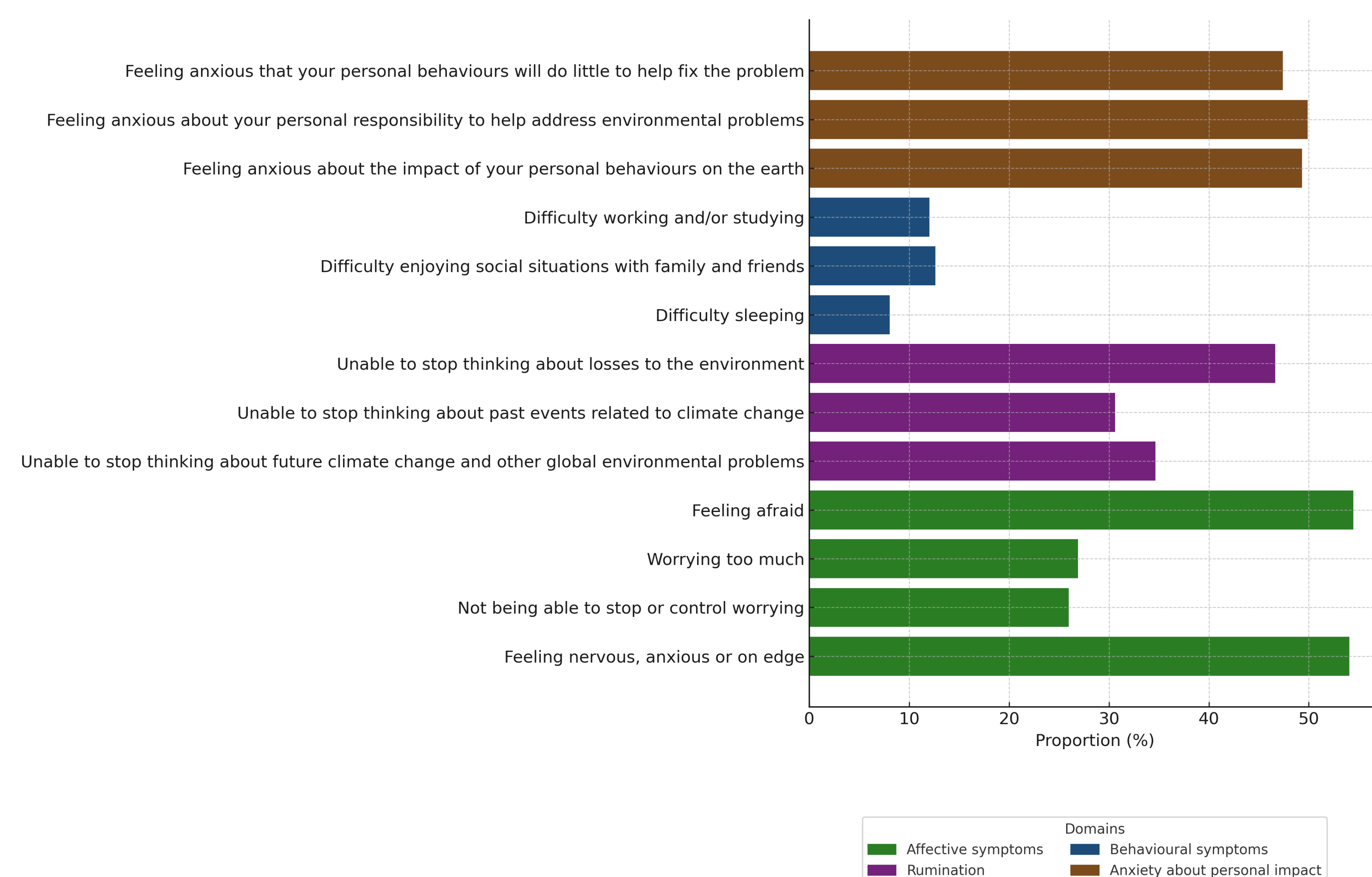
**Measures:** Eco-anxiety was assessed using the **Hogg scale**. Several multi-level contributing factors were considered.

- Individual-level:** sex, mental health problems [Beck Anxiety and Depression Inventory, Strengths and Difficulties Questionnaire], school type, and sources of environmental information.
- Household-level:** parental education, household income, maternal migration status, maternal depression and anxiety, and pet ownership.
- Neighbourhood-level:** greenness, pollution, temperature, distance to the coast, urbanicity, and proximity to sources of noise/contamination reported in the news.

**Statistical Analysis:** Multi-level logistic regression models were applied to identify factors linked with elevated eco-anxiety (above the 5<sup>th</sup> quintile).

## RESULTS

Of the total participants, **1188** provided **valid responses** (56% female, average age 16.9 years). The median eco-anxiety score was 4 (Q1-Q3 = 1-8).



Eco-anxiety scale (Over the last 2 weeks, how often have you been bothered by the following problems when thinking about climate change and other global environmental conditions? [proportion selecting several of the days or over half the days or nearly every day])

## RESULTS (CONTINUED)

Associations (odds ratio and 95% Confidence intervals) between eco-anxiety levels and variables at individual, household, and neighbourhood levels, obtained using multivariable logistic regression (n=1188, Generation XXI, Porto Metropolitan Area, Portugal).

Variables	Model 1	Model 2	Model 3
Sex (female)	2.11 (1.44-3.11)**		
Beck Depression Inventory <sup>‡</sup>	1.03 (1.00-1.05)**		
Beck Anxiety Inventory	1.06 (1.04-1.09)**		
Strengths and Difficulties Questionnaire scale	1.08 (1.04-1.12)**		
Preferred source of information about environmental issues			
Internet (yes, ref: no)	1.55 (1.09-2.20)**		
Social media (yes, ref: no)	1.46 (1.01-2.12)**		
Documentaries (yes, ref: no)	2.09 (1.20-3.59)**		
Podcasts (yes, ref: no)	5.21 (1.47-18.68)**		
Household income <sup>‡</sup>		0.90 (0.79-1.02)	
Residence near sources of pollution (yes, ref: no)			1.56 (1.09-2.23)**

Model 1 includes variables assessed at the individual level; Model 2 includes variables from Model 1 plus variables assessed at the household level.; Model 3 includes variables from Model 2 plus variables assessed at the neighbourhood level; <sup>‡</sup>variable assessed at the 13-years follow-up; <sup>¶</sup>variable assessed at the 10-years follow-up; \*\*p-value <0.05

Those more likely to experience elevated eco-anxiety include:

- Females**, who are 64% more likely than males to have higher eco-anxiety.
- Adolescents with frequent **anxiety, depression, and behavioral/emotional problems**.
- Adolescents who prefer obtaining **environmental information** from internet sources, social media, documentaries, or podcasts.
- Adolescents **living near pollution sources** (water, noise, air) commonly reported in the news.

## CONCLUSIONS

Gender, information sources, and mental health were the strongest contributors to eco-anxiety. Household- and neighbourhood-level factors were largely unrelated, except for proximity to pollution sources reported in the news, which was linked to higher eco-anxiety levels.

## REFERENCES

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## AUTHOR INFORMATION

Ana Isabel Ribeiro MPH PhD ([ana.isabel.ribeiro@ispup.up.pt](mailto:ana.isabel.ribeiro@ispup.up.pt))  
Public Health Institute University of Porto Portugal  
Health and Territory Research Lab



Check for more info about the author

