

Exploring the Relationships Between Eco-Anxiety, Eco-Guilt, Eco-Grief, and Pro-Environmental Behavior: A Cross-Sectional Study

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Introduction

Mental health affectations due to climate change, such as eco-anxiety, eco-guilt, and eco-grief, are increasingly being investigated. These eco-emotions have individually been positively related to each other and to pro-environmental behavior (PEB; e.g., Ágoston et al., 2022; Nambiar & Singh, 2023). However, no prior studies have jointly examined these variables in more complex models. Additionally, countries such as the Netherlands and Germany are at an increased risk of flooding due to climate change, yet research is scarce in these populations.

Aims

This study examined (1) the relationship between eco-anxiety and PEB, while (2) considering eco-guilt and eco-grief as mediators, and (3) age, gender, and proximity to water as moderators. Moderating effects were also tested on the potential mediating pathways. The hypotheses are visualized in Figure 1.

Methods

A cross-sectional study was conducted using an online survey. Participants ($n = 311$) were recruited through convenience and snowball sampling. Inclusion criteria were to be 18 years or older, have a Dutch or German nationality, and currently live in the Netherlands or Germany. The following psychological scales were used: Eco-Anxiety Questionnaire, Eco-Guilt Questionnaire, Ecological Grief Questionnaire (Ágoston et al., 2022), and Pro-Environmental Behavior Scale (Markle, 2013). One binary item assessed proximity to water. Data were analyzed using linear regression for H1 and PROCESS Macro models 4, 7, and 15 (Hayes, 2022) for H2 and H3.

Results

Descriptive statistics

All eco-emotions and PEB were significantly, positively correlated to each other ($p < .001$). Moderate to strong correlations were found.

Inferential statistics

H1. Eco-anxiety and PEB were positively associated, $b = 0.44$, $SE = 0.04$, $t(309) = 10.31$, $p < .001$.

H2. Eco-guilt was a mediator, while eco-grief was not. The standardized indirect effects of eco-anxiety on PEB are shown in Table 1.

While eco-anxiety and eco-guilt, as well as eco-guilt and PEB, were all positively correlated, the indirect effect of eco-guilt on PEB in the mediation model has a negative coefficient. The S-curve (Figure 2) and the reversal of the sign suggest that eco-guilt may be a confounding variable of the relationship between eco-anxiety and PEB.

H3. Only age moderated the mediation of eco-guilt on the eco-anxiety to eco-guilt path, $b < -0.01$, $SE < 0.01$, $t(307) = -2.01$, $p = .046$. No moderation was found on the other paths.

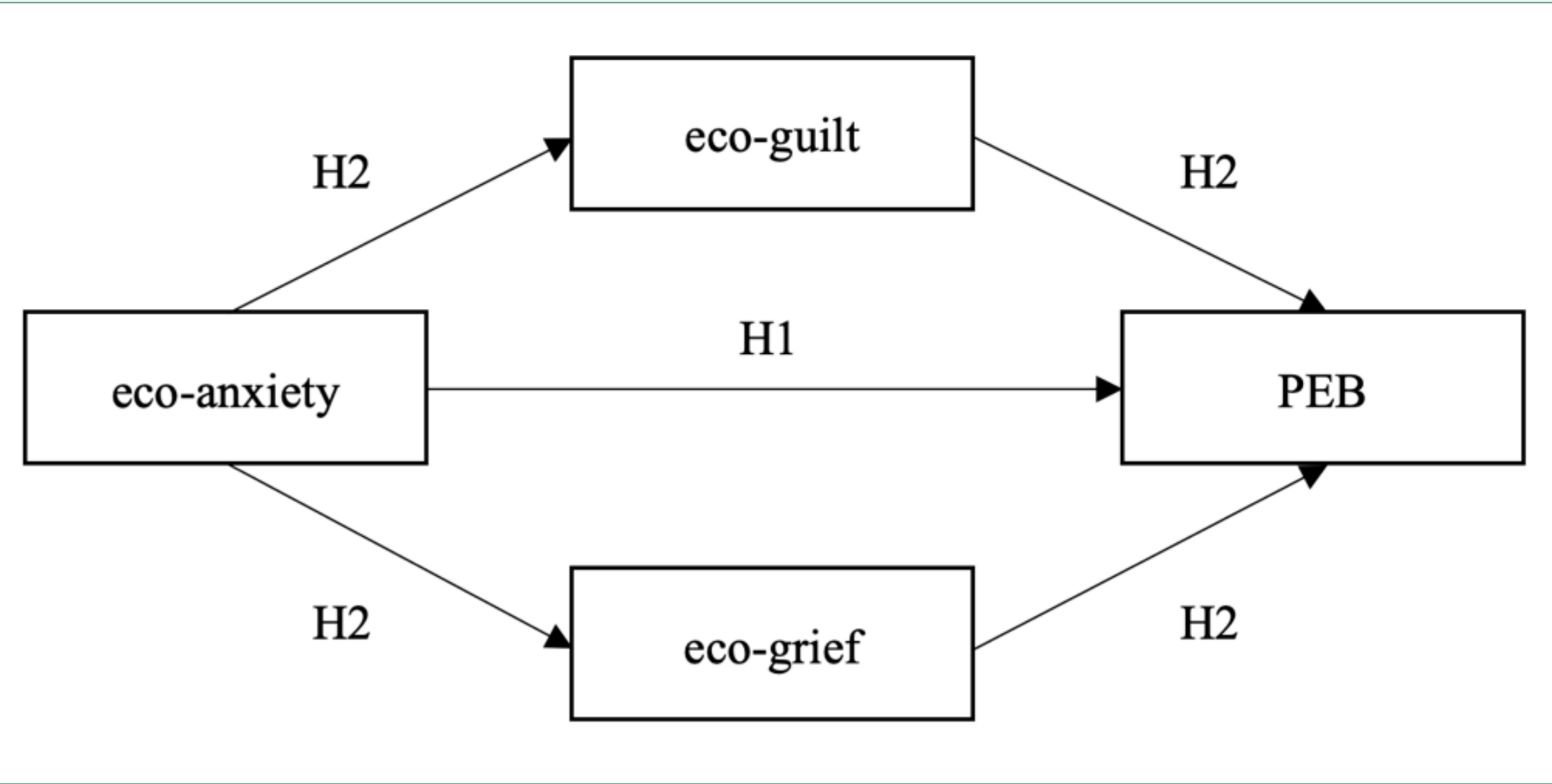


Figure 1. Moderated mediation model with hypothesized associations. Moderation effects (H3) were tested on all pathways.

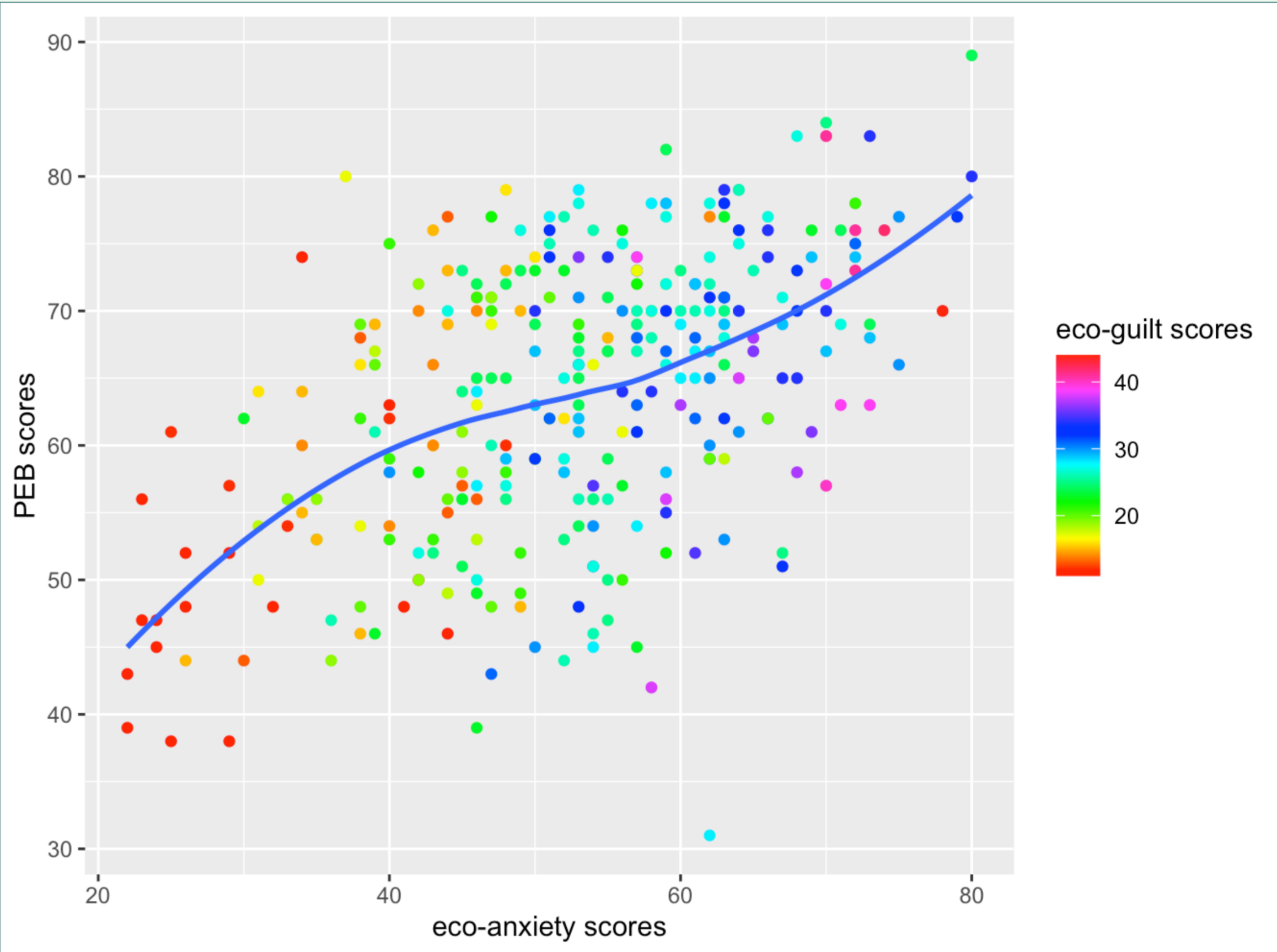


Figure 2. Confounding effect of eco-guilt on the relationship between eco-anxiety and PEB.

Discussion

The findings highlight that interventions for coping with climate change should focus on reducing eco-anxiety and simultaneously stimulating PEB. Decreasing eco-guilt levels may positively impact eco-anxiety and PEB, given its mediating role. The mainly non-significant findings regarding age, gender, and proximity to water suggest that interventions should apply to various populations.

Future directions

- To validate the four psychological scales in Dutch and German; they were only forward-translated by five native speakers before implementation in the current study.
- To specify the item regarding proximity to water to avoid ambiguity in how “closeness” is defined (e.g., including distance).
- To replicate the study with a more balanced sample (age, education level) to increase representativeness and generalizability.
- To conduct similar studies with longitudinal designs to establish causality.

Call for action

While the results provide preliminary insights, eco-emotions remain underexplored in vulnerable countries like the Netherlands and Germany. Similar studies should be conducted on a larger scale to further explore the implications of climate change on mental health and specifically identify groups that may be at an increased risk.

	β	SE	LLCI / ULCI
Total	< -0.01	0.08	-0.16 / 0.14
Eco-guilt	-0.12	0.05	-0.22 / -0.02
Eco-grief	0.11	0.06	-0.01 / 0.23

Table 1. Standardized indirect effects of eco-anxiety on PEB.

References

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