

Eco-anxiety and Consumer Behavior

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Abstract

The global ecological crisis generates an emerging form of psychological distress termed eco-anxiety, whose effects on pro-environmental behavior (PEB) remain insufficient clarified in the literature, particularly in Eastern European contexts. The present study investigated the relationship between eco-anxiety and PEB in a Romanian sample, examining the mediating role of biospheric values, ecological identity, ecological self-efficacy, and eco-guilt. A sample of $N = 363$ participants (online snowball sampling) completed the Hogg Eco-Anxiety Scale (HEAS-13, Hogg et al., 2021), the Integrated Pro-Environmental Behaviors Scale (I-PEBS, Pasquariello et al., 2025), and validated items measuring the mediator (biospheric values, ecological identity, self-efficacy, eco-guilt). Data were analysed using OLS regressions, bootstrap mediation analysis, and structural equation modelling (SEM; lavaan, MLR estimator). Seven of eight sub-hypothesis received statistical support. Biospheric values strongly predicted ecological identity ($\beta = 0.58$) and self-efficacy ($\beta = 0.54$). Eco-anxiety directly and positively predicts PEB ($\beta = 0.35$), functioning as an adaptive behavioral motivator. Dimensional analysis of the HEAS-13 revealed that the personal impact subscale was the only robust predictor of PEB ($\beta = 0.28$), while rumination and behavioral symptoms did not reach statistical significance. Self-efficacy mediation was not significant (indirect effect = 0.021). Eco-guilt independently contributed to PEB ($\beta = 0.12$). At moderate levels, eco-anxiety acts as a catalyst rather than a paralysing factor for ecological behavior. Anxiety specifically related to one's own environmental impact is the form most directly associated with behavioral motivation. The integrated structural model confirms a causal chain from biospheric values to pro-environmental behavior, mediated by ecological identity. Findings have implications for public communication about the climate crisis and for psychological interventions targeting eco-anxiety.

Keywords

Climate crisis; ecological identity; eco-anxiety; ecological self-efficacy; pro-environmental behavior; eco-guilt; HEAS-13

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Introduction

Due to globalization and extensive media coverage, the population has become increasingly aware of the catastrophic consequences and systemic changes taking place globally. Although previous research has focused primarily on the effects of climate change on physical health, the psychological ramifications are having increasing scientific attention. In this context, “eco-anxiety” or “chronic fear of ecological disaster” has become a central concept encompassing feelings of worry, fear, and anxiety about environmental degradation and the impact of climate change on the planet. The literature emphasizes that eco-anxiety is largely considered a natural, rational, and potentially adaptive emotional response. On the one hand, anxiety is fundamentally a practical emotion that alerts the individual to potential threats and can motivate proactive engagement in problem-mitigating actions. A moderate level of anxiety can act as a catalyst for pro-environmental behaviors (PEB). On the other hand, overwhelming anxiety can have the opposite effect, leading to “eco-paralysis”, defined as a passive state of behavioural stasis, characterized by apathy, hopelessness, and a sense of helplessness.

This duality raises a fundamental research question: what are the determinants that influence whether an individual's eco-anxiety will manifest as an adaptive (action) or maladaptive (eco-paralysis) response? Starting from this paradox, the main objective of this paper is to investigate how the feeling of eco-anxiety can be effectively transformed into a catalyst for pro-environmental actions and consumer behaviour change. Specifically, the paper aims to analyze the mechanisms of psychological mediation, focusing on the role of ecological self-efficacy (the individual's confidence in their own ability to manage and positively influence environmental problems).

Understanding these mediating factors is essential because research suggests that self-efficacy can prevent eco-paralysis, motivating anxious individuals to adopt sustainable consumption behaviors. At the same time, readiness for change may function as a mental process that facilitates the transition from paralyzing stress to practical action. Thus, our proposed model will provide an integrated perspective on how ecological concern can be channelled into constructive environmental engagement.

1. Review of the scientific literature

Eco-anxiety is described as a persistent worry, fear, or chronic anxiety about environmental degradation and climate change (Ágoston et al., 2022; Lutz et al., 2023). Eco-anxiety should not be automatically pathologized; it is, to a large extent, a rational and natural response to a real global threat (Ágoston et al., 2022; Mathers-Jones & Todd, 2023).

Conceptualizing Eco-Anxiety: Between Adaptive Reaction and Stasis (Eco-Paralysis). The literature highlights a major dichotomy on how this environmental stress manifests itself on behaviour. On one hand, practical anxiety represents an activating response that stimulates information seeking and action, acting as a catalyst. Studies based on daily diary demonstrate that eco-anxiety also fluctuates as a state, not just as a trait, and on days when individuals experience higher levels of eco-anxiety, they report greater involvement in pro-environmental actions (Lutz et al., 2023). On the other hand, eco-paralysis is a maladaptive reaction, which is a state of behavioural stasis, apathy, and a profound sense of helplessness (Innocenti et al., 2023). When anxiety becomes overwhelming, individuals may give up on all ecological efforts, feeling that their actions are futile.

Psychological Foundation: Biosphere Values and Green Self-Identity. To understand why some people feel eco-anxiety, the roots values need to be analysed. According to recent models tested in the Italian context (Pasquariello et al., 2025), the starting point are analysing biospheric values - which prioritize the well-being of ecosystems regardless of their human utility. Biosphere values directly and positively predict the formation of a green self-identity, as people who value nature come to integrate caring for the environment into their very definition of self. Ecological identity is the strongest predictor of pro-environmental behaviour (PEB). But this identity comes at an emotional cost: individuals with a strong ecological identity are more vulnerable and prone to eco-anxiety. Paradoxically, biospheric values, in themselves, do not directly cause eco-anxiety; they do so only indirectly, through identity internalization, which then functions as a lens through which the climate threat is experienced as a personal drama.

Multidimensionality of Eco-Anxiety (HEAS-13). The HEAS-13 scale decomposes eco-anxiety into four distinct dimensions: affective symptoms, rumination, behavioural symptoms, and anxiety related to personal impact (Baroni et al., 2025; Hogg et al., 2021). This differentiation is vital to answering our research question: not all dimensions of anxiety motivate action. Rumination (repetitive thinking about the climate crisis) and personal impact anxiety are directly associated with initiating conservation and sustainable transportation behaviors, as keeping environmental issues top of mind through rumination motivates sustainable engagement. In contrast, behavioural (e.g. sleep disorders) and affective symptoms present indirect or contradictory effects, requiring additional psychological mechanisms (mediators) to be transformed into useful action.

Turning Anxiety into Action and the Role of Green Self-Efficacy. Innocenti et al.'s study (2023) demonstrates that climate-related anxiety has a dual effect: a direct positive effect on PEB (as a coping mechanism through problem-solving), and a negative indirect effect by decreasing perceived self-efficacy. Specifically, anxiety decreases the individual's confidence in their ability to change something, thus leading to eco-paralysis. The solution, or catalyst, lies in green self-efficacy, which mediates this relationship. Interventions (or psychological mechanisms) that increase feelings of efficacy prevent paralysis. Interestingly, developing a strong ecological identity predicts higher levels of self-efficacy, demonstrating that individuals who define themselves as "green" have a greater ability to maintain confidence that their actions matter, even when they are anxious.

Readiness to Change (RTC). In addition to self-efficacy, Baroni et al. (2025) introduced Readiness for Change (RTC) as a crucial mechanism for translating affective or behavioural states of eco-anxiety into pro-environmental actions. In this regard, risk perception mediates the link between affective symptoms of eco-anxiety and conservation actions, as negative affect is channelled into action when the individual becomes rationally and deeply aware of the severity of the crisis. Furthermore, sense of agency mediates the relationship between paralyzing behavioural symptoms (sleep deprivation, social avoidance) and ecological citizenship behaviors. When a behaviourally overwhelmed individual perceives that the solutions offered (e.g., recycling, sustainable diet) are truly effective, he regains his sense of agency, transforming stasis into proactivity.

Complementary Factors: Eco-Guilt and Attention Variability. Unlike anxiety (which is future-oriented), eco-guilt is related to past actions and failure to meet ecological moral standards. Studies show that guilt is positively correlated with PEB, but sometimes less so than ecological sadness or practical anxiety, as guilt related to one's own existence can accentuate helplessness (Ágoston et al., 2022). Regarding attentional bias, cognitively, eco-anxiety leads to predominantly pro-environmental behaviour when attentional bias variability is low. People who can maintain a steady focus, without being completely distracted by negative stimuli, are able to transform stress into action (Mathers-Jones & Todd, 2023).

The specialized literature shows that the feeling of eco-anxiety does not effectively transform into pro-environmental action automatically but requires a mediating psychological ecosystem. The foundation is created by biospheric values that build a green identity. This identity generates eco-anxiety. To prevent this eco-anxiety from turning into eco-paralysis (by decreasing self-efficacy), it must be processed through cognitive catalysts: constructive rumination, strengthening ecological self-efficacy, and activating readiness for change (RTC) (by recognizing the effectiveness of solutions). Only in this way, emotion becomes a sustainable driver of changing consumer behavior.

Accordingly, to the literature review, we determine the following hypothesis to be teste:

H1a: Biospheric values will positively and significantly predict ecological identity.

H1b: Biospheric values will positively and significantly predict ecological self-efficacy.

H2a: Ecological identity will positively and significantly predict eco-anxiety.

H2b: Ecological identity will positively and significantly predict ecological self-efficacy.

H3: Eco-anxiety will directly and positively predict pro-environmental behavior (PEB).

H4: HEAS-13 subscales will differentially predict PEB, with the hierarchy: personal impact > rumination > affective/behavioral

H5: Ecological self-efficacy will partially mediate the relationship between eco-anxiety and PEB.

H6: Eco-guilt will independently and positively correlate with pro-environmental behavior.

2. Research methodology

The present study adopts a cross-sectional correlation design, with data collection carried out by an online self-administrated questionnaire. The main objective of the research is to investigate the relationship between eco-anxiety and pro-environmental behavior, while examining identity, biospheric values, and eco-guilt. The study follows the structure of a multiple mediation model (Baron & Kenny, 1986; Hayes, 2013), tested using a structural equation model (SEM).

The final sample consisted of N = 363 participants, recruited through convenience sampling (snowball sampling) on the Google Forms platform in period 15-30 April. The measurement instruments are the following: eco-anxiety (HEAS-13) measured using Hogg Eco-Anxiety Scale, developed and validated by Hogg et al. (2021) which contains 13 items grouped into four distinct subscales: affective subscale (item 1-4), rumination subscale (item 5-7), behavioral subscale (item 8-10), personal impact subscale (item 11-13); Pro-environmental Behavior (Adapted I-PEBS) adapted after Pasquariello et. al (2025) and Agoston et al. (2022) which contains 11 Likert items that measure daily behaviors and 3 yes/no items that measure ecological activism; Mediators and Ecological Attitudes which contains 5 items, one for the following constructs – Ecological self-efficacy and Ecological identity and 2 items for Biospheric values and Eco-guilt.

Raw data processing was performed in R (version 2025.05.1+513) using the packages tidyverse, psych, lavaan, mediation and corplot. The following composite scores were calculated: total eco-anxiety – mean

of the four subscales (affective, rumination, behavioral, personal impact), each computed as the mean of its items; daily PEB – mean of the 11 Likert items, after reversing the mean consumption item; activism – sum of the yes/no items, subsequently standardized for inclusion in total PEB; total PEB – weighted mean between daily PEB (75%) and standardized activism (25%); eco-guilt – arithmetic mean of the two items for this construct.

Data analysis followed the sequence recommended by Anderson & Gerbing (1988) and Hayes (2013): descriptive statistics; internal consistency – Cronbach's alpha for multiple item scales; Pearson correlations (examination of bivariate associations with two-tailed significance tests); multiple linear OLS regressions (testing direct effects for H1 – H4 and H6, reporting standardized coefficients and effect size); bootstrap mediation analysis (testing H5 using lavaan, estimating indirect effects and 95% confidence intervals); full SEM model (estimated in lavaan using MLR estimator and bootstrap standard errors).

3. Results and discussion

For all 363 respondents, the age distribution shows a predominantly young adult population, with majority of participants concentrated in the 19-23 age range (33.33% are 19 years old, 15.43% are 20 years old, 23.69% are 21 years old). The sample shows a predominance of female participants, which is common in social science and psychology research (58.40% participants are female). In case of studies, the majority are students, 50.96% in first year, 13.50% in second year and 34.44 in the third year. The sample is predominantly composed of Business Administration students (75.48%).

Internal consistency of all instruments was satisfactory to excellent ($\alpha = 0.78 - 0.91$), meeting the conventional threshold of $\alpha \geq 0.70$ (Nunnally, 1978). We have a Cronbach alpha of 0.91 for Eco-anxiety, 0.87 for affective subscale, 0.83 for rumination subscale, 0.81 for behavioral subscale, 0.84 for personal impact subscale, 0.78 for eco-guilt and 0.81 for PEB. All constructs meet the threshold of confident reliability (CR) greater than 0.70. For Average Variance Expected (AVE) we have the following constructs with good convergent validity: global eco-anxiety, affective subscale, rumination, behavioral, personal impact and eco-guilt. The item PEM is a composite scale rather than a reflective one, which makes AVE conceptually less relevant.

Pearson correlation among all key variables of the model shows a clear and consistent pattern of positive association (Table no. 1). Biospheric values are strongly correlated with both ecological identity ($r = 0.59$) and ecological self-efficacy ($r = 0.54$), suggesting they function as a foundational driver of ecological attitudes. Ecological identity is also strongly related to self-efficacy ($r = 0.58$) and moderately associated with eco-guilt ($r = 0.46$), indicating its central role in linking values to both cognition and emotion. Eco-anxiety shows modest but significant correlation with all variables, including pro-environmental behavior ($r = 0.35$), supporting its role as a behavioral motivator. Eco-guilt is moderately associated with both eco-anxiety ($r = 0.30$) and PEB ($r = 0.25$), suggesting it contributes independently to ecological action. Finally, PEB is positively correlated with all predictors, with the strongest association observed for eco-anxiety, followed by biospheric values and eco-guilt. Overall, the matrix supports the proposed model, with stronger relationships among cognitive and value-based variables and moderate links to behavior.

Table no. 1. Pearson correlation matrix

Variable	1	2	3	4	5	6
1. Biospheric values	-	0.59***	0.54***	0.20***	0.54***	0.23***
2. Ecological identity		-	0.58***	0.19***	0.46***	0.22***
3. Self-efficacy			-	0.16**	0.44***	0.19***
4. Eco-anxiety				-	0.30***	0.35***
5. Eco-guilt					-	0.25***
6. Total PEB						-

Note: ** - $p < 0,01$; *** $p < 0,001$ (to tailed test)

To simultaneously test all hypotheses, we used Structural Equation Modeling (SEM) approach with maximum likelihood estimation and bootstrap for confidence intervals. The model included the following paths: biospheric values > ecological identity and self-efficacy; ecological identity > eco-anxiety and self-

efficacy; eco-anxiety, self-efficacy, and eco-guilt > pro-environmental behavior (PEB). The results of the SEM model are presented in Table no. 2.

Table no. 2. Summary of hypothesis testing

H	Tested relationship	Statistic	p	R ² /beta	Conclusion
H1	Biospheric values → Ecological identity	beta = .58	< .001	.35	SUPPORTED
H1b	Biospheric values → Self-efficacy	beta = .54	< .001	.29	SUPPORTED
H2	Ecological identity → Eco-anxiety	beta = .19	< .001	.04	SUPPORTED
H2b	Ecological identity → Self-efficacy	beta = .58	< .001	.34	SUPPORTED
H3	Eco-anxiety → PEB	beta = .35	< .001	.12	SUPPORTED
H4	Personal impact → PEB	beta = .28	< .001	.15	PARTIALLY SUPPORTED
H5	Mediation (eco-anx → PEB)	Indirect = .021	.101	.053	NOT SUPPORTED
H6	Eco-guilt → PEB	r = .25	< .001	.06	SUPPORTED

The model demonstrated acceptable fit indices: chi square = 47.37, $p < 0.001$; CFI = 0.927; TLI = 0.844, RMSEA = 0.127; SRMR = 0.079. The explained variance (R^2) was 33.7% for ecological identity, 39.6% for self-efficacy, 3.6% for eco-anxiety, and 12.4% for PEB.

The first hypothesis was tested using two simple linear regressions. Biospheric values significantly predict both ecological identity, $\beta = 0.58$, $p < 0.001$, $R^2 = 0.35$, and ecological self-efficacy, $\beta = 0.54$, $p < 0.001$, $R^2 = 0.29$. these results support H1 and are consistent with the model proposed by Pasquariello et al. (2025), which demonstrates that biospheric values constitute the cognitive foundation of individual ecological engagement.

The 2-nd hypothesis was tested using simple linear regression. Ecological identity significantly predicted both total eco-anxiety, $\beta = 0.19$, $p < 0.001$, $R^2 = 0.04$, and ecological self-efficacy, $\beta = 0.58$, $p < 0.001$, $R^2 = 0.34$. although the effect of identity on eco-anxiety is modest, the direction of the relationship is consistent with theoretical predictions of the Value-to-Action model (Pasquariello et al., 2025). H2 is supported.

In the case of hypothesis 3, regression analysis indicated a significant direct effect of total eco-anxiety on PEB, $\beta = 0.35$, $p < 0.001$, $R^2 = 0.12$. Eco-anxiety explains 12% of the variance in pro-environmental behavior, supporting H3 and the adaptive interpretation according to which concern about the environment functions as a behavioral motivator (Innocenti et al., 2023). H3 is supported.

Hypothesis 4 proposed that not all dimensions of eco-anxiety predict PEB. Regression with the four subscales as simultaneous predictions partially confirmed this hypothesis: the personal impact subscale showed the strongest unique significant effect, $\beta = 0.32$, $p < 0.001$, followed by the affective subscale, $\beta = 0.16$, $p < 0.001$. in contrast, the rumination subscale, $\beta = -0.07$, $p = 0.39$, and behavioral subscale, $\beta = 0.01$, $p = 0.83$, did not reach statistical significance. These results partially supported H4 and are consistent with Baroni et al. (2025), highlighting that anxiety related to personal impact has the most direct effect on ecological action. Eco-anxiety explains 15% of the variation of PEB.

The fact that rumination and behavioral subscale are not statistically significant can be explained by two mechanisms. First, in a multiple regression model, the subscales competed simultaneously for variance and the high correlations between them reduced their partial contributions, effect that is not present in Baroni et al. (2025) paper. Second, behavioral signs reflect a profile that is more paralyzing than motivational, requiring other mediators in order to become pro-environmental action (Baroni et al., 2025).

The 5-th hypothesis proposed that self-efficacy mediates the relationship between eco-anxiety and PEB, predicting both a direct positive effect and an indirect negative effect. Mediation analysis was conducted using bootstrap estimators in lavaan, R package. Path a (eco-anxiety > self-efficacy) was significant, $\beta = 0.30$, $z = 2.83$, $p = 0.005$, indicating that higher levels of eco-anxiety are associated with slightly increased self-efficacy. Path b (self-efficacy > PEB) was marginally significant, $\beta = 0.07$, $z = 2.10$, $p = 0.036$. the direct effect remained strongly significant, $\beta = 0.38$, $z = 5.98$, $p < 0.001$. the indirect effect ($a \times b = 0.021$) did not reach statistical significance, 95% bootstrap confidence interval is [0.002; 0.050], $p = 0.10$,

explaining only 5.3% of the total effect. Mediation is therefore not statistically supported at alpha 0.05. These results suggest that in the present sample eco-anxiety primarily acts as a direct predictor of pro-environmental behavior, without self-efficacy functioning as a significant mediator. H5 is partially supported.

The fact that the mediation through self-efficacy is not statistically significant can be explained by the path *b* (self-efficacy – PEB) which is only marginally significant ($\beta = 0.07$, $p = 0.036$) which limits the magnitude of the indirect effect. Also, Innocenti et al. (2023) demonstrated that eco-anxiety has a positive direct effect on PEB and a negative indirect effect through reduced self-efficacy; this double dynamic that, in the present sample, appears to have been absorbed by strong direct effect ($\beta = 0.38$), and so the mediation doesn't have sufficient statistical power. These results suggest that self-efficacy functions more as an independent predictor of PEB than as a mechanism through which eco-anxiety is transmitted.

The last hypothesis, H6, we developed a correlation analysis that indicated a significant positive association between eco-guilt and PEB, simple regression confirmed this relationship, $\beta = 0.25$, $p < 0.001$, $R^2 = 0.06$. eco-guilt explains 6% of the variance in pro-environmental behavior, supporting H6 and replicating findings by Agoston et al. (2022). H6 is supported.

Conclusions

The present study investigated the relationship between eco-anxiety and pro-environmental behavior, using a structural equation model. The results provide a nuanced and theoretical picture of the psychological mechanism through which concern about the ecological crisis translated or not into action.

Eco-anxiety is not necessarily a dysfunctional phenomenon. In the sample investigated in this paper, moderate levels of concern about climate change are positively associated with concrete ecological behaviors. This conclusion has direct implications for public narratives about eco-anxiety, the systematic pathologization of this emotion may be, paradoxically, counterproductive, as it would suppress a real behavioral motivator.

From our study we can conclude that not all forms of eco-anxiety are equal in relation to behavior. Anxiety specifically related to the impact of one's own behavior (the HEAS personal impact subscale) is the form most strongly associated with ecological action, while generalized affective symptoms and rumination do not significantly predict PEB when the other components are controlled. This suggests that assessment tools and clinical interventions should distinguish between these forms and specifically target anxiety related to personal responsibility.

Another major conclusion is that biospheric values and ecological identity are strong distal predictors of the entire ecological motivational system. The effect of biospheric values on pro-environmental behavior manifests indirectly, through the strengthening of ecological identity and self-efficacy, rather than directly. This indicates that long-term changes in ecological behavior require interventions at the level of values and identity, not only at the level of observable behaviors.

The last major conclusion is that eco-guilt is complementary motivator, distinct from eco-anxiety. The two emotional constructs independently explain variation in pro-environmental behavior, which justifies their joint inclusion in research models and psychological assessment instruments.

Overall, the present study provides an integrated and empirically validated model of the relationship between eco-anxiety and pro-environmental behavior in the young population in a different cultural and socioeconomic context that Pasquariello et al. (2025) and Innocenti et al. (2023) proposed in their papers. The results can inform both clinical psychological interventions addressing eco-anxiety, as well as public policies and communication campaigns aimed at increasing citizens' ecological engagement.

Because of the limitation of our research due to the homogeneity of sample, our future purpose is to develop an enhancing model considering the heterogenic segment of age and not the only of Z generation; based on cultural background, innate traits, learned influences, and acquired dimensions, rural vs urban, gender. Other limitations for the study are the following: the cross-sectional sample exclude inferential causes, all variables are self-reported and the uni-cultural context limits the generalizability of the findings.

Further studies could adopt a longitudinal sample to test the direction of the eco-anxiety-PEB relationship. Also, replicating the study in samples from rural environments or from other East European countries would help clarify the role of cultural context. Finally, the inclusion of objective behavioral measures such as carbon footprint or verifiable energy consumption would overcome the limitations associated with self-reporting.

Generative Artificial Intelligence (GenAI) usage statement

ChatGPT (version 5.0) was responsibly used for language improvement. After this process, the authors reviewed and edited the content as needed and take full responsibility for the content of the present article.

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