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More than personality: How emotional intelligence moderates the association of personality traits and adolescents' pro-environmental behaviour

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ABSTRACT

Personality traits have been associated with adolescents' pro-environmental behaviour, but findings remain inconsistent. This variability suggests that the strength to which personality traits are associated to pro-environmental behaviour may be influenced by other psychological variables. This study explored whether emotional intelligence played a moderator role in the relationship between personality traits and pro-environmental behaviour in a sample of 1855 Portuguese adolescents (M_{age} = 14.52 years, SD_{age} = 1.76 years, 49,2% female). Results showed that all personality traits, except neuroticism, were significantly positively associated with pro-environmental behaviour. Furthermore, emotional intelligence, defined as an individual's ability to perceive, understand, and manage emotions both in themselves and others, moderated the relationship between extraversion and agreeableness and pro-environmental behaviour, such that higher emotional intelligence strengthened the positive association between these traits and adolescents' pro-environmental behaviour. These findings underscore the role of personality in shaping adolescents' pro-environmental tendencies and suggest that emotional intelligence may act as a useful psychological resource to enhance pro-environmental behaviour, particularly among more extraverted and agreeable youth.

1. Introduction

Adolescence is crucial for shaping many aspects of personal and social values, as well as for developing behavioural patterns that often persist into adulthood. Adolescents start developing a sense of who they are, what they care about, and what side to take when it comes to the most significant challenges facing the world including the climate crisis. While some adolescents respond to climate threats by adopting pro-environmental behaviours (Hogg et al., 2024), others feel powerless, leading to inaction or "eco-paralysis" (Grapsas et al., 2023). These contrasting reactions raise important questions as to the psychological factors that influence pro-environmental behaviour during this stage of life.

One promising line of research focuses on individual differences in personality traits, which shape how young people emotionally process and respond to environmental threats. People exposed to the same threat experience can manage their emotions differently depending on their personality traits (Akber et al., 2024), leading to divergent behavioural responses (Lazarus & Folkman, 1987). Research on the association between personality traits and pro-environmental behaviour in adolescents reported inconsistent results (Lisboa et al., 2024), suggesting that such association may be moderated by additional psychological factors (Hirsh, 2014; Mõttus et al., 2020).

Considering that personality traits are related to behaviour by shaping emotions (Sacchi & Dan-Glauser, 2025), emotional intelligence may be one of such moderators. Defined as the ability to perceive,

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understand, express, use and regulate feelings and emotions (Wong & Law, 2002), emotional intelligence implies not only managing one's own emotional experiences but also recognising and responding appropriately to others' emotions (Salovey & Mayer, 1990). Recent studies have shown that these abilities are effective in strengthening pro-environmental behaviour (Marchetti et al., 2024). Adolescents with a high level of emotional intelligence may thus be more likely to be more empathetic about sustainability issues, to process and manage emotions concerning environmental threats, and to take stock of the impact of their own behaviours on climate change (Di Fabio & Kenny, 2021).

Previous research has shown that emotional intelligence moderates the relationship between personality traits and behavioural outcomes in a variety of life domains (e.g. Salami, 2011). These results suggest that the link between personality traits and behaviour varies across different levels of emotional intelligence. Yet, despite personality traits and emotional intelligence develops during adolescence interacting with each other (Megías-Robles et al., 2024), there has been no contributions to our knowledge examining the different patterns of personality traits and emotional intelligence associated to pro-environmental behaviour. To this end, in this study with a large adolescent sample we sought to examine our hypothesis that emotional intelligence moderates the relationship between personality traits and pro-environmental behaviour, strengthening it.

1.1. Personality traits and pro-environmental behaviour: the moderator role of emotional intelligence

Prior research has shown that emotional intelligence can moderate the relationship between environmental beliefs and pro-environmental outcomes (Aguilar-Luzón et al., 2014). Specifically, people with stronger ecocentric beliefs (or weaker anthropocentric beliefs) and higher emotional intelligence tend to report greater pro-environmental attitudes, intention and behaviour. Among adolescents, emotional intelligence has also been found to moderate the link between pro-environmental attitudes and pro-environmental behaviours. Those who have a greater ability to manage, control and understand emotions, turn attitudes into pro-environmental behaviour more effectively (Robinson et al., 2018). Moreover, emotional intelligence has mitigated the negative association between the "dark triad" and pro-environmental behaviour (Giancola et al., 2023). These results suggest that emotional intelligence may facilitate the use of adaptive strategies to link attitudes, traits and emotions with pro-environmental behaviour (Peña-Sarrionandia et al., 2015).

Emotional intelligence may become therefore especially relevant to foster pro-environmental behaviours. When facing environmental threats, people tend to experience emotional reactions (Carrus et al., 2008; Clayton & Ogunbode, 2023). The extent to which these emotional reactions influence the adoption (or not) of pro-environmental behaviour will depend on how personality traits shape the ability to regulate those emotional reactions (Purnamaningsih, 2017). Considering that emotional intelligence is critical to motivate pro-environmental behaviour (Panno et al., 2015), adolescents with higher emotional intelligence would be more likely to recognise, understand and regulate these emotional responses, which may boost their capacity to choose constructive strategies in the face of climate-related stressors. In this way, we hypothesise that, when adolescents react to environmental threats, the interaction between personality traits and emotional intelligence increases the adoption of pro-environmental behaviours (Ojala & Bengtsson, 2018). Below, we outline how such interaction may occur.

People who are open to experience enjoy exploring new emotions and sensations (McCrae & Costa, 1983). Thereby, emotional intelligence may help them to better identify and regulate emotions triggered by environmental threats, amplifying their tendency to behave pro-environmentally (Milfont, 2021; Panno et al., 2021).

Conscientious people are organised, goal-directed, and self-disciplined (Witt et al., 2002). Responding adaptively to environmental threats often requires managing emotional reactions such as frustration, anxiety or overwhelm. Therefore, emotional intelligence may enhance conscientious adolescents' ability to process these emotions constructively, helping them to stay focused on long-term goals despite emotionally challenging contexts. By strengthening their reflective and self-controlled nature, emotional intelligence could support the adoption of pro-environmental behaviour as a deliberate and sustained coping strategy (Chen et al., 2022).

Extroverts are sociable, seek stimulation and support to cope with stressful situations (Gashi et al., 2022). Since emotional intelligence implies social skills and prosocial responses (Moreno & Del Mar Molero Jurado, 2024), extrovert adolescents with high levels of emotional intelligence may perceive pro-environmental behaviour as a socially meaningful way to mitigate environmental problems (Boluda-Verdú et al., 2022).

Agreeableness reflects a strong motivation to understand others' emotions and forge positive relationships, often involving a willingness to act altruistically (Hellwig & Schulze, 2022). Emotional intelligence may amplify this empathy and increase sensitivity to others' environmental concerns, strengthening the adoption of pro-environmental behaviour as a prosocial strategy to alleviate collective problems.

Neuroticism is associated with more distressed emotions, maladaptive emotion-focused coping strategies and to self-blame (Lin et al., 2023). Hence, emotional intelligence may act as a protective factor, equipping people with more adaptive emotion regulation strategies and the ability to overcome emotional challenges (Soriano-Sánchez & Jiménez-Vázquez, 2023). In neurotic adolescents, emotional intelligence may help redirect environmental worry into constructive action, fostering pro-environmental behaviour as a means of coping with stress and perceived threats, channelling them onto a pro-environmental and pro-active path, similarly to findings of previous studies on stress and pro-environmental behaviour (Homburg & Stolberg, 2006; Meloni et al., 2019).

Built upon these arguments, this study aims to examine if emotional intelligence moderates the relationship between personality traits and pro-environmental behaviour. Our research model is depicted in Fig. 1.

2. Materials and method

2.1. Participants and procedure

A total of 1855 Portuguese adolescents (49.2% females), from 11 to 18 years of age (M_{age} = 14.52, SD_{age} = 1.76) filled out an in-class self-reported questionnaire accessible online. Data collection was conducted in accordance with the Declaration of Helsinki, supervised by one of the

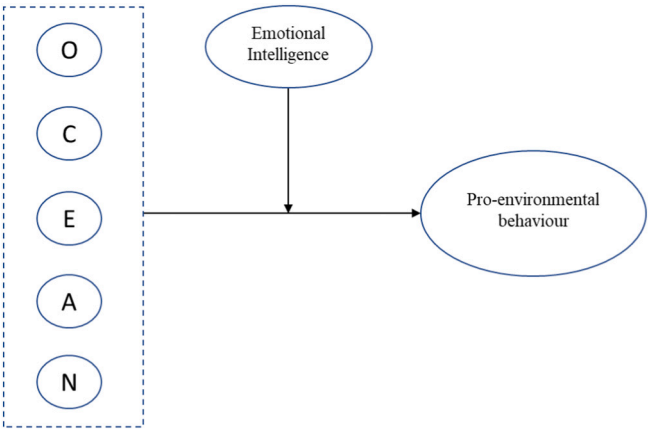

Fig. 1. Proposed research model.
Note. O = Openness to experience; C = Conscientiousness; E = Extraversion; A = Agreeableness; N = Neuroticism.

researchers. The study is part of a broader research project that strives to explore the relationship between personality and pro-environmental behaviour among adolescents. It was approved by the University of Santiago de Compostela Bioethics Committee (USC30/2022) and the Portuguese Ministry of Education (0814600001). The study was not preregistered.

Consent for data collection was obtained from the schools' administrations, from parents or legal guardians and from participants adolescents. All participants provided informed consent after being informed about the anonymity of the study, the voluntary participation, the right to withdraw participation at any time and the treatment of the data following ethical standards in accordance with the Declaration of Helsinki.

2.2. Measures

Below we briefly describe the measures used in this study; the full item sets, complete response formats and scale ranges, together with information on scale structure and preliminary analyses, are provided in the Supplementary Material.

To assess pro-environmental behaviour the 33 items taken from the General Ecological Behaviour Scale for Adolescents (Kaiser et al., 2007) were used. Behaviours were related to energy conservation, mobility and transportation, waste avoidance, recycling, consumerism, and vicarious behaviours toward conservation. The three mobility's items despite collected were not included in the analysis. This has been decided considering that, generally speaking, Portuguese adolescents may not have sufficient independence in mobility; furthermore adolescents' mobility independence in Portugal has declined over the last number of years (Cordovil et al., 2015). Cronbach's alpha scores in this scale, excluding mobility's items, was 0.74.

Personality traits were measured using the 20-item (4 item for trait) version of the Revised NEO Personality Inventory (Costa & McCrae, 1992), validated for the Portuguese population (Bertoquini & Pais-Ribeiro, 2006). Dimensions comprise of openness to experience ($\alpha = 0.68$), conscientiousness ($\alpha = 0.78$), extraversion ($\alpha = 0.70$), agreeableness ($\alpha = 0.51$), and neuroticism ($\alpha = 0.51$). In studies using brief measures low internal consistency such as that of agreeableness and neuroticism is common (e.g., Hopwood et al., 2021; Kuo et al., 2025). Nevertheless, and despite some research supports the validity of the 20-item personality instrument among the Portuguese population (e.g., Dourado et al., 2017), we decided to carry out a Confirmatory Factor Analysis to examine the factorial structure of the model. The initial factorial structure of the five personality traits did not show adequate model fit (χ^2 [160, $N = 1855$] = 1541.28, $p < .001$; CFI = 0.833; RMSEA = 0.068 [0.065, 0.71]; SRMR = 0.061). Two items from the agreeableness scale and two items from the neuroticism scale exhibited very low factor loadings and were therefore removed. After their removal, because each subscale had only two items, inter-item correlations (r) were calculated. Results were: agreeableness, $r = 0.36$; neuroticism, $r = 0.51$. The fit of the five-factor model after removing these items has improved substantially, reaching acceptable levels (χ^2 [94, $N = 1855$] = 761.98, $p < .001$; CFI = 0.909; RMSEA = 0.062 [0.058, 0.66]; SRMR = 0.049). Accordingly, subsequent analyses were conducted using the reduced agreeableness and neuroticism scales, while preserving the underlying conceptual structure of the Big Five framework (detailed information in Supplementary Material).

To assess participants' emotional intelligence, we used the 16-item Emotional Intelligence Scale (Wong & Law, 2002) adapted and validated in Portuguese by Rodrigues et al. (2011). Items measured self-emotion appraisal, others' emotion appraisal, use of emotion, and regulation of emotion. In this study we used the combined scale (Cronbach's $\alpha = 0.85$).

2.3. Data analysis

Descriptive statistics and Pearson's correlations were computed using SPSS 28.0. Moderation analyses (Model 1) were conducted with the PROCESS macro for SPSS (v. 4.2; Hayes, 2022), estimating 95% confidence intervals for all effects. Five separate models were tested, each including one personality trait, emotional intelligence, and their interaction as predictors of pro-environmental behaviour. To isolate the unique contribution of each trait, the remaining four traits were included as covariates, along with age and gender. All reported coefficients are unstandardised.

3. Results

3.1. Descriptive statistics and correlations

Table 1 shows descriptive statistics and bivariate correlations. The participants showed high levels of emotional intelligence, and a mean score of pro-environmental behaviour close to the midpoint of the scale. While neuroticism was non-significantly correlated with pro-environmental behaviour, higher scores in the other traits were significantly associated with greater pro-environmental behaviour.

Furthermore, higher levels of conscientiousness, extraversion, and agreeableness were associated with higher levels of emotional intelligence, whereas higher levels of neuroticism were related to lower emotional intelligence. In turn, openness to experience was non-significantly correlated with emotional intelligence. Finally, we found that higher emotional intelligence is associated with a tendency toward more pro-environmental behaviour.

3.2. Results of emotional intelligence as moderator

Full model coefficients are reported in the Supplementary Material.

Results of the interaction effect between emotional intelligence and each of the personality traits on pro-environmental behaviour shows that emotional intelligence the interaction effect was non-statistically significant for openness to experience ($B = -0.06$, $SE = 0.03$, $p = .06$, 95% CI [−0.12, 0.01]), conscientiousness ($B = 0.05$, $SE = 0.03$, $p = .17$, 95% CI [−0.02, 0.11]) and neuroticism ($B = -0.04$, $SE = 0.03$, $p = .08$, 95% CI [−0.09, 0.01]). On the contrary, emotional intelligence moderated the effect of extraversion ($B = 0.09$, $SE = 0.03$, $p < .05$, 95% CI [0.03, 0.16]) and agreeableness ($B = 0.07$, $SE = 0.03$, $p < .05$, 95% CI [0.01, 0.12]).

Furthermore, we analysed the conditional effects of extraversion and agreeableness on pro-environmental behaviour at the 16th, 50th and 84th percentiles (Hayes, 2022), corresponding to low, moderate and high levels of emotional intelligence. Concerning extraversion, results show that while its effect was not statistically significant at low levels of emotional intelligence ($B = -0.01$, $SE = 0.03$, $p = .94$, 95% CI [−0.07, 0.06]), it was statistically significant for those with moderate ($B = 0.06$, $SE = 0.03$, $p < .05$, 95% CI [0.01, 0.11]), and high ($B = 0.10$, $SE = 0.03$, $p < .001$, 95% CI [0.04, 0.17]) levels of emotional intelligence (Fig. 2).

Regarding agreeableness, its effect on pro-environmental behaviour was statistically significant at low ($B = 0.05$, $SE = 0.02$, $p < .05$, 95% CI [0.01, 0.10]) moderate ($B = 0.09$, $SE = 0.02$, $p < .001$, 95% CI [0.06, 0.13]) and high ($B = 0.13$, $SE = 0.02$, $p < .001$, 95% CI [0.08, 0.18]) levels of emotional intelligence (Fig. 3).

4. Discussion

Adolescents play a key role in achieving the Sustainable Development Goals, making it essential to understand the psychological factors that foster pro-environmental behaviour. Personality traits are recognised as one of such factors (Denault et al., 2024), but the previous mixed results suggest that its relation may be moderated by other variables (Mõttus et al., 2020). Thus, based on previous findings in other

Table 1
Means, standard deviations, and Pearson's correlations between personality traits, emotional intelligence and pro-environmental behaviour.

	M	*SD*	1.	2.	3.	4.	5.	6.	7.
1. Openness to experience	3.00	0.86	–						
2. Conscientiousness	3.71	0.68	0.03	–		.			
3. Extraversion	3.59	0.71	−0.06*	0.50**	–				
4. Agreeableness	3.26	0.87	0.03	0.18**	0.28**	–			
5. Neuroticism	2.86	0.97	0.22**	−0.31**	−0.40**	−0.10**	–		
6. Emotional intelligence	3.58	0.56	−0.03	0.58**	0.51**	0.25**	−0.45**	–	
7. Pro-environmental behaviour	2.83	0.71	0.26**	0.19**	0.14**	0.17**	0.01	0.19**	–

Note. $n = 1855$.
* $p < .05$.
** $p < .01$.

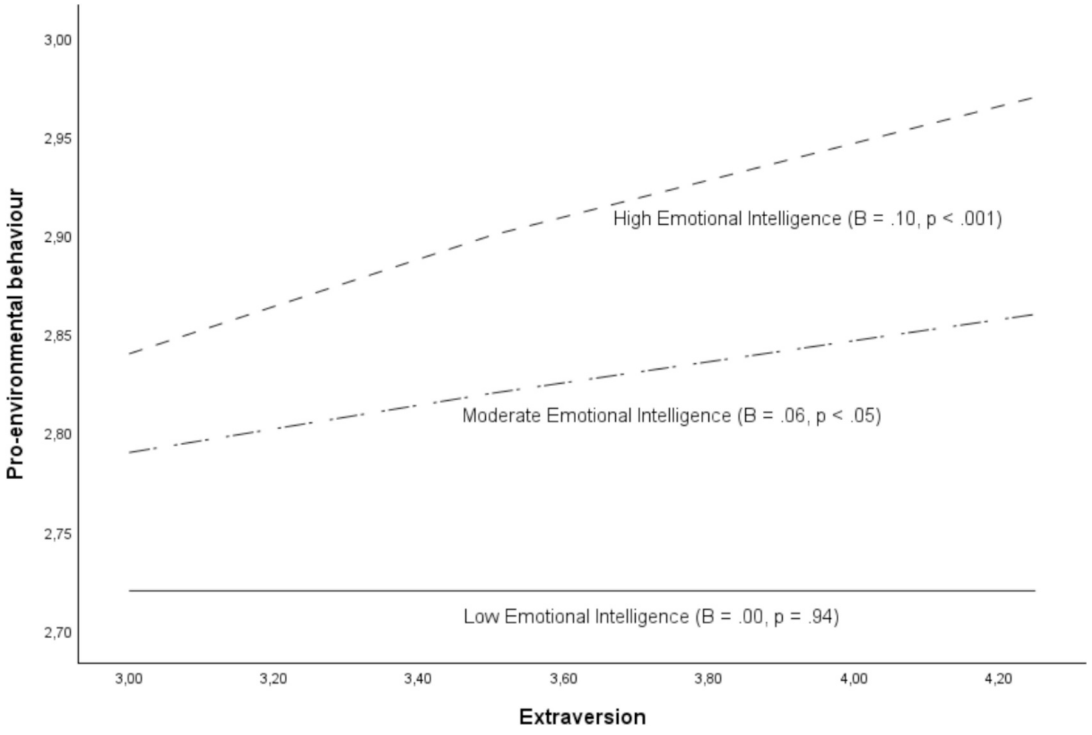

Fig. 2. Moderating effect of emotional intelligence on the relationship between extraversion and pro-environmental behaviour.

domains (e.g., Salami, 2011), we hypothesised that emotional intelligence moderates the association between personality traits and pro-environmental behaviour.

Our cross-sectional research provided initial support that extraversion and agreeableness exerted a differential effect on pro-environmental behaviour as a function of emotional intelligence. Specifically, extraversion and agreeableness were significantly associated with pro-environmental behaviour and as extrovert and agreeable adolescents' levels of emotional intelligence increase, so does the association with pro-environmental behaviour.

Extraversion and agreeableness have been identified as the most prosocial personality traits (Bleidorn et al., 2025). People who are high in extraversion have high levels of interpersonal skills, and socially active and agreeable people show more altruistic and compassionate behaviours (Costa & McCrae, 1992). Thereby, these characteristics may result in greater performance of pro-environmental behaviour, a form of prosocial behaviour according to many authors (e.g., Klein et al., 2022).

In this regard, climate change presented as one of the greatest threats to humanity, affecting particularly adolescents (Rocha et al., 2022), may appeal for altruism - a selfless concern for the well-being of others (Eisenberg & Miller, 1987). Emotional abilities expand adolescents' altruistic behaviour (Wang et al., 2023) and action taking skills alike (Asimopoulos et al., 2020). Thus, emotional intelligence may be boosting extroverted and agreeable adolescents' awareness of others' emotional states about environmental threats, as well as their ability in regulating such emotions acting pro-environmentally. To sum up, emotional intelligence may assist extroverted and agreeable adolescents in addressing and mitigating environmental threats by prioritising altruistic values (Schultz, 2001). Similarly, emotional intelligence may be a key for supporting other adolescents engaged in pro-environmental behaviours (Sloot et al., 2019).

The non-significant interaction between openness to experience, conscientiousness and neuroticism was contrary to our expectations. Given the significant association between openness to experience and conscientiousness with pro-environmental behaviour, it seems that for these two traits behaving pro-environmentally is not primarily conditional to a high degree of emotional intelligence. Other characteristics may lead to a propensity of these traits to be engaged in pro-environmental behaviours. For example, aesthetic appreciation of nature or more engagement in novel and challenge behaviours may play a role for more open adolescents (Poškus, 2021), or the tendency to plan for better future outcomes staying focused on long-term goals may play a role for those more conscientious adolescents. These results seem to align with previous consistent results underlying openness as the

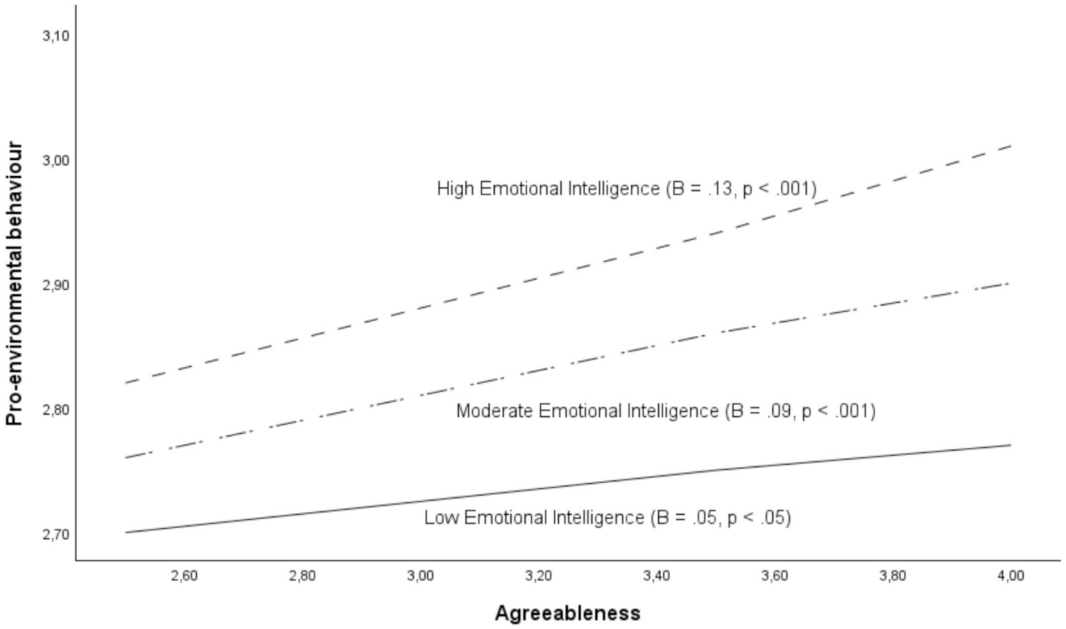

Fig. 3. Moderating effect of emotional intelligence on the relationship between agreeableness and pro-environmental behaviour.

environmentalist trait (Soutter et al., 2020) and conscientiousness as significantly associated with environmentalism (e.g., Soutter & Mõttus, 2021).

Despite neuroticism' increased levels of negative emotions and environmental concern (Hirsh, 2010), the more neurotic adolescents were not likely to report more pro-environmental behaviours. These results seem to align with previous evidence showing that concern may amplify unpleasant emotions (e.g., fear), leading to avoid action (e.g. Hopwood et al., 2021; Ireland et al., 2014; Liga et al., 2024). Apparently, their emotional intelligence was also not helping them to transform the concern into action.

4.1. Implications, limitations and future directions

Our findings provide tentative guidance for the design of pro-environmental interventions with adolescents. By identifying emotional intelligence as a moderator of extraversion and agreeableness, the results suggest that programmes aimed at strengthening emotional competencies may enhance the effectiveness of interventions for these profiles. For more neurotic adolescents, initiatives focused on emotion regulation may help them manage climate-related anxiety and reduce avoidance tendencies, potentially facilitating more constructive engagement with environmental issues.

In contrast, because openness to experience and conscientiousness were associated with pro-environmental behaviour independently of emotional intelligence, interventions that frame sustainability as future-oriented, innovative, and socially responsible may be particularly appropriate for these traits.

This study has several limitations. First, its cross-sectional design, combined with a single-country sample, prevents causal inferences and limits generalisability. Longitudinal and experimental studies across different cultural contexts are needed to test whether training emotional intelligence can strengthen pro-environmental behaviour over time. Second, reliance on self-report measures constitutes an important measurement limitation. Despite being recommended for adolescent samples (Omrani et al., 2018), brief personality measures may yield low internal consistency (Hopwood et al., 2021). Future research should therefore replicate these findings using longer, more reliable personality instruments and, where possible, complement self-reports with behavioural or observational indicators of pro-environmental behaviour. Accordingly, our results should be interpreted with caution pending such replications.

5. Conclusions

Adolescents' pro-environmental behaviour is critical for addressing climate emergency. Our study shows that associating pro-environmental action with open and conscientious traits may be a keyway to foster environmental engagement among adolescents. Similarly, emotional intelligence strengthens the association between extraversion and agreeableness and pro-environmental behaviour. Although emotional intelligence did not moderate neuroticism, neuroticism showed a positive, though non-significant, association with pro-environmental behaviour, suggesting that adolescents who tend to experience more negative emotions may engage in this behaviour, overcoming the inaction. Overall, this study highlights the importance of considering both personality and emotional processes when designing interventions to promote pro-environmental behaviour in adolescence.

CRediT authorship contribution statement

Paulo Vítor Lisboa: Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Cristina Gómez-Román:** Writing – review & editing, Supervision, Conceptualization. **Sergio Vila-Tojo:** Writing – review & editing, Supervision, Methodology, Conceptualization. **Giuseppe Carrus:** Writing – review & editing, Supervision, Conceptualization. **Ana Paula Monteiro:** Writing – review & editing, Supervision, Conceptualization.

Declaration of Generative AI and AI-assisted technologies in the writing process

All authors declare that they have not used any generative artificial intelligence tools for scientific writing.

Declaration of competing interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2026.113724.

Data availability

Data will be made available on request.

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