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RESEARCH AND THEORY

Eco-emotions among young people in Valle de Aburrá, Colombia: an exploratory survey of emotional responses, institutional perceptions and action

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Abstract
This exploratory study describes the eco-emotions reported by young people aged 18 to 28 in the Área Metropolitana del Valle de Aburrá, Colombia, and their perceptions of how local government, companies and the education system respond to climate change and ecological degradation. An online survey was answered by a convenience sample of 516 young people, almost all with secondary education or higher. Emotions are reported in six groups (anxiety and fear, sorrow, anger, guilt and shame, powerlessness, and positive or detached responses) and interpreted through the framework of moral injury. Most respondents felt sad (86.2%), afraid (81.8%), powerless (77.7%) and guilty (76.4%); half also felt optimistic. Women reported negative emotions more often than men, with small to medium differences. Few respondents felt protected or valued by government or companies, between 27% and 42% did not know how their local government was responding, and strong negative emotions were more frequent towards companies. Emotions did not vary with trust in local government. Respondents reported high willingness to act and 83.3% had changed their lifestyle, but only 27.1% took part in environmental initiatives, and participation was unrelated to emotions. We discuss these findings in relation to Latin American research on eco-emotions and solastalgia and to the Colombian context, where environmental defenders face high risks, and derive implications for climate education, youth participation, institutional communication and emotional support.

Keywords Eco-emotions · Eco-anxiety · Youth · Moral injury · Climate action · Latin America

Introduction

Climate change has affected and will continue to affect ecosystems, economies and public health on an unprecedented scale (IPCC 2022; Ripple et al. 2024). Yet, it is only one of the nine planetary boundaries, seven of which have been transgressed (Findlay et al. 2025; Levke Caesar et al., n.d.; Richardson et al. 2023)— a sobering reality. Against this backdrop, the present article examines the emotions that young people experience in relation to climate change and ecological degradation. These emotions are often grouped under the label of eco-anxiety, commonly described as persistent worry about the future of the planet (Foster 2022). Our study explores how they appear among young people aged 18 to 28 living in the municipalities of the Área Metropolitana del Valle de Aburrá (AMVA), Colombia. Our approach is not clinical: many manifestations of eco-anxiety are not pathological (Pihkala 2020b), and our aim is to describe

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them in order to engage more effectively with young people, inform public policy and improve university curricula.

There is no agreed definition of eco-anxiety, and reviews of the literature on young people point to persistent conceptual ambiguity (Galway et al. 2026). The terms eco-anxiety and climate anxiety are often used for feelings other than anxiety, such as sadness, guilt and anger (Wu et al. 2026). In this article we use *eco-emotions* as the umbrella term for emotional responses to climate change and ecological degradation, following the usage of Wu et al. (2026), and we reserve *eco-anxiety* for anxiety-related responses (feeling anxious or afraid). Emotional responses do not always translate into action (S. Clayton and Karazsia 2020), and media narratives can amplify them, especially among people with no direct experience of environmental disasters (Shao and Yu 2023).

These emotions are unevenly distributed. Young people are particularly vulnerable because of their stage of development (Wu et al. 2020), and the burden is larger in low- and middle-income countries and in places affected by poverty or conflict (Giannakopoulos 2025). Research, however, remains concentrated in the Global North: a bibliometric analysis of 1,570 publications found that production is dominated by institutions in high-income, mainly English-speaking countries (Hoyos-Alayo 2025), and environmental psychology continues to rely on Western, educated and urban samples (Tabligan et al. 2026). Evidence from Latin America is growing (Agudelo-Hernández et al. 2026; Mejia et al. 2026; Schor et al. 2025), but, to our knowledge, no study has described the eco-emotions of young adults in the AMVA or how they perceive the responses of local institutions.

The study is descriptive and exploratory and addresses four questions: (1) which eco-emotions do young people in the AMVA report, and how do they co-occur; (2) how do they perceive the responses of local government, companies and the formal education system; (3) how are connection with nature, gender and the components of action competence for sustainability related to these emotions; and (4) to what extent do young people act, individually and collectively.

Study context: Colombia and the Valle de Aburrá

The AMVA comprises ten municipalities, including Medellín, with nearly 4.2 million inhabitants (Área Metropolitana del Valle de Aburrá, n.d). It is a densely urbanised and industrialised valley that faces air pollution, noise, floods, landslides and biodiversity loss (Medellín Cómo Vamos, 2021). For most young residents, exposure to environmental degradation combines visible local problems with information about national and global impacts received through the media.

The national context matters for both emotions and action. Colombia has lived through decades of armed conflict, much of it linked to disputes over land and natural resources. According to Global Witness, Colombia recorded more killings of land and environmental defenders than any other country in 2022 (60), 2023 (79, the highest annual total documented for any country) and 2024 (48) (Global Witness, 2023, 2024, 2025). The Escazú Agreement, which includes provisions to protect environmental defenders, was approved by Congress through Law 2273 of 2022 and declared constitutional on 28 August 2024. Public environmental engagement in Colombia therefore takes place in a setting where it can be perceived as risky. More broadly, in many Latin American countries political instability, insecurity and everyday economic urgencies compete with environmental concerns for attention, while climate change multiplies those same problems (Mejia et al. 2026). Colombian research describes this overlap of displacement, food insecurity and environmental degradation as a polycrisis (Agudelo-Hernández et al. 2025, 2026), and the recurrence of extreme weather events in Colombia is among the highest in South America (Thomaes 2026).

Background

From eco-anxiety to a spectrum of eco-emotions

Eco-anxiety is not necessarily pathological. Pihkala (2020a) frames it as a moral emotion that arises from an accurate appraisal of the ecological crisis; it can motivate precaution and problem-solving, but when combined with uncertainty and lack of control it can lead to helplessness or paralysis. Cunsolo et al. (2020) make a similar point about ecological grief.

Recent work shows that anxiety is only one of several distinct responses. In developing the Inventory of Climate Emotions in Poland, Marczak et al. (2023) identified eight factors: anger, contempt, enthusiasm, powerlessness, guilt, isolation, anxiety and sorrow. These emotions are correlated but relate differently to action: anger, sorrow and anxiety were associated with support for climate policy and with individual mitigation, whereas powerlessness and isolation were not. A rapid review of 48 qualitative studies with children and adolescents found worry, fear, anxiety and anger to be the most frequently reported eco-emotions, together with sadness, grief, powerlessness and helplessness, but also hope and apathy (Wu et al. 2026). Eco-anger has been found to be more consistently associated with climate action than eco-anxiety or eco-depression (Stanley et al. 2021), and eco-anxiety appears to lead to collective action mainly when accompanied by anger (Dauvergne and van der Ven 2026). For these reasons we report the emotion items in conceptual groups rather than as interchangeable indicators of eco-anxiety.

Theoretical framework: moral injury, appraisal and social suffering

Hickman et al. (2021) found that young people in ten countries rated government responses to climate change negatively, reported more betrayal than reassurance, and that their distress was associated with the perception that governments were failing to respond. They proposed that this failure potentially constitutes moral injury. Henritze et al. (2023) develop this idea into a framework for climate distress. Moral injury results from a moral violation, either when one acts against one's own sense of what is right or when another actor betrays one's values. The two forms carry different emotions: injury caused by others is linked to anger and betrayal, and injury caused by oneself to guilt and shame. Climate distress thus arises from moral conflict along two dimensions, agency and responsibility (guilt, shame and anger) and powerlessness (depression, grief and betrayal), and its form depends on social position and access to political power. Two of their arguments are relevant here: young adults may experience other-directed moral injury when they perceive that institutions are failing to act, and self-directed moral injury is heightened when responsibility for sustainability is framed as a matter of individual behaviour rather than of economic and political practices. The authors also note that activists in the Global South tend to be motivated by guilt and anger in addition to fear.

Appraisal theory explains why these emotions have different consequences. Anxiety, associated with uncertain threat, motivates vigilance, whereas anger, associated with perceived injustice and a blameworthy agent, motivates action to challenge those responsible (Tabligan et al. 2026). In a longitudinal study of Filipino young adults, climate justice beliefs predicted later pro-environmental behaviour through both anxiety and anger, and participants directed their anger at corporations and political leaders (Tabligan et al. 2026). Finally, how distress is framed in public matters. An analysis of 274 news articles identified three frames for young people's climate distress: exaggerated "teen angst", an appropriate response to a real threat, and social suffering caused by societal inaction (Murray et al. 2026). The third frame avoids pathologising shared experiences and places distress in young people's social and political circumstances. Clinical authors likewise recommend validating young people's concerns and warn that perceived inaction or betrayal by leaders can aggravate burnout and moral injury among those who engage (Gunasiri et al. 2026). We use these frameworks to interpret our results, not as hypotheses to be tested causally. They lead us to distinguish other-directed emotions and beliefs (anger, betrayal, mistrust), self-directed emotions (guilt, shame) and powerlessness.

Connection with nature and action competence

People who value nature for its beauty and importance, or who work with the land, tend to feel stronger eco-anxiety (Pihkala 2020b), because they perceive its degradation as the loss of something valued (Whitmarsh et al. 2022). Connection with nature can therefore intensify eco-emotions while remaining a resource. Latin American evidence shows both sides. Among 639 adolescents from rural Bolivia, emotional affinity with nature was associated with higher well-being, but very high connectedness appeared to reduce it, possibly through powerlessness or eco-anxiety in the face of environmental threats (Guillén Aguirre and Dorado Alem 2025). Among Colombian adolescents, solastalgia coexisted with higher resilience in an Indigenous community and was interpreted as a sign of active bonds with the territory rather than as pathology (Agudelo-Hernández et al. 2026). Social and nature-based connections are also among the most promising ways of coping identified in reviews (Galway et al. 2026; Gunasiri et al. 2026). Exposure can be direct, through disasters (Wu et al. 2020), or indirect, through awareness of the crisis (S. Clayton and Karazsia 2020); reviews of youth mental health distinguish direct exposure, chronic disruption of ecological and social systems, and existential distress (Giannakopoulos 2025).

Because young people are a central audience for educational initiatives, we also measured the *action competence for sustainability*: knowledge of action possibilities, confidence in one's own influence and willingness to act (Olsson et al. 2020). Low self-efficacy is one of the main explanations for why concerned young people do not act (Thomaes 2026), and powerlessness is the eco-emotion least connected to engagement (Marczak et al. 2023). At the same time, among Dutch and Colombian adolescents climate anxiety was associated with more, not less, pro-environmental behaviour, modestly for private behaviours and strongly for public ones such as activism (Becht et al. 2024; as reported in Thomaes 2026). We therefore examine whether the three components are associated with emotions and with participation.

Eco-emotions and solastalgia in Latin America

The largest regional study to date surveyed 3,320 people in twelve Latin American countries and found higher eco-anxiety scores in Argentina, Colombia and Ecuador, and lower scores among men and among people with postgraduate education (Mejia et al. 2026). The authors stress that these comparisons are exploratory because the sample was recruited online through snowball sampling, a caution that also applies to our study. Qualitative research in Brazil adds

detail. Among young people aged 10 to 16 in Fortaleza who reported climate anxiety, distress took the form of sadness, despair and anxiety tied to the local environment; school education on climate change was lacking, which led to misinformation and uncertainty; the absence of policies against deforestation was a stressor; and the media was the main source of information (Schor et al. 2025). When asked what would help, the same young people proposed school-based psychological support, climate education and discussion groups that would allow collective action (Frota et al. 2025).

In Colombia, research has concentrated on rural and Indigenous communities and on solastalgia, the distress experienced when the home environment is transformed while people remain in it (Albrecht et al. 2007). In an Emberá Dobidá community in Caldas, rising heat and the loss of clean water were linked to food insecurity and to serious mental health problems among children (Agudelo-Hernández et al. 2025). A study of 1,005 adolescents compared an urban community affected by construction, a semi-urban community undergoing agricultural change and an Indigenous community exposed to extractivism: solastalgia was present in all three and somewhat higher in the Indigenous community (Agudelo-Hernández et al. 2026). In Zacatecas, Mexico, open-pit mining forced the displacement of a rural community and produced solastalgia while the company presented the project as sustainable (Uribe-Sierra et al. 2024). In nationally representative samples of 12 to 14 year olds, only 11% of Colombian adolescents did not clearly agree that climate change is as big a problem as researchers claim, against 36% in the Netherlands, a difference the author relates to more direct experience of climate impacts (Thomaes 2026). Teacher professional development programmes on climate change education have been designed and evaluated in Chile and Mexico with Colombian partners (Reyes et al. 2024).

This literature shows that eco-emotions in Latin America are shaped by territory, inequality and institutional fragility. It has focused on children and adolescents, on rural and Indigenous communities, or on multi-country adult samples. Urban young adults, and their perceptions of how local institutions respond, have received little attention. This is the gap our study addresses.

Methodology

Design and participants

We conducted a cross-sectional, descriptive and exploratory study based on an anonymous online survey administered between 12 July and 28 August 2024. The final sample included 516 participants aged 18 to 28. In Colombia, people aged 14 to 28 are officially considered youth; those under 18 were excluded because of the difficulty of obtaining parental consent. Respondents were recruited through personal invitations during university courses and in selected public places in Medellín, and through QR codes distributed on social media. This is a non-probabilistic convenience sample.

Instrument and comparability with Hickman et al. (2021)

The survey was based on the instrument of Hickman et al. (2021), with adaptations. Questions were added on connection with nature (a single item: "I feel a connection with nature and the environment in my daily life", four-point agreement scale), on perceptions of companies and of the education system, on the three components of action competence for sustainability (Olsson et al. 2020), and on participation in environmental initiatives. The full instrument is provided as supplementary material and the data are available on request.

Because of these adaptations, the two studies are not directly comparable, and we present the values of Hickman et al. (2021) only as a descriptive reference. The main differences are the following. Hickman et al. surveyed 10,000 people aged 16 to 25 in ten countries through an online panel in May and June 2021; we surveyed 516 people aged 18 to 28 in one metropolitan area through convenience recruitment in July and August 2024. Their emotion items asked about climate change and were answered "Yes", "No", "Prefer not to say"; ours asked about climate change and ecological degradation and were answered "A lot", "Somewhat" or "Not at all". Their items on beliefs about the future and about government also offered "Prefer not to say"; ours offered "Yes" or "No" for the future and "Yes", "No" or "I don't know" for government, and referred to local (municipal) government rather than to government in general. Finally, their emotional reactions to institutional response concerned government only; we asked about government and companies. No statistical tests were performed between the two studies.

Context of data collection

Responses may have been influenced by events around the time of data collection. The survey followed the 2023 to 2024 El Niño event, during which the national government declared a disaster situation in January 2024 amid hundreds of forest fires, and Bogotá introduced water rationing in April 2024 (CNN Español, 2024; Rodríguez 2024). Colombia was also preparing to host the United Nations biodiversity conference (COP16) in Cali in October 2024, which

increased media attention to environmental issues (Convention on Biological Diversity, 2024). Furthermore, air-quality alerts were issued in the AMVA in 2024 (Noticias Telemedellín, 2024). These circumstances may have raised the salience of environmental problems and the intensity of the emotions reported.

Analysis

Absolute and relative frequencies were calculated for all items. For reporting, the fourteen emotion items were arranged in six conceptual groups informed by the Inventory of Climate Emotions (Marczak et al. 2023) and by the range of eco-emotions found in young people (Wu et al. 2026): anxiety and fear (anxious, afraid); sorrow (sad, grief, hurt, depressed); anger (angry); guilt and shame (guilty, ashamed); powerlessness (powerless, despair, helpless); and positive or detached responses (optimistic, indifferent). The grouping is conceptual and was not validated psychometrically.

Given the exploratory aim, inferential analysis was limited to relationships defined in advance from the research questions: connection with nature, gender, trust in local government and the three components of action competence, each against the emotion items (and, for gender, also beliefs about the future and about local government); and participation in environmental initiatives against emotions and sociodemographic variables. We used the chi-square test of independence (Fisher's exact test where expected counts were below five), adjusted p-values within each family of tests with the Holm method, and report Cramér's V as the effect size, where values around 0.1 are small, 0.3 medium and 0.5 large. To explore confounding without multivariate modelling, the analysis of trust and emotions was repeated within strata of gender, educational level and connection with nature. Gender comparisons include women and men only. Co-occurrence among emotions was examined with Spearman's rank correlation. Urban and rural respondents are compared descriptively only, given the size of the rural group ($n=34$).

Results

Sample

Two thirds of the 516 participants (66.7%) were aged 18 to 20 (Table 1). The distribution across municipalities broadly resembled their share of the AMVA population, except that Bello was underrepresented (3.1% of responses against around 16% of the population) and Envigado overrepresented (16.2% against around 6%). Most participants lived in urban areas (93.4%, against 95% in the AMVA) and the gender distribution (48.3% women, 50.8% men) was close to that of the region (52.6% and 47.4%; Área Metropolitana del Valle de Aburrá, n.d). These similarities do not make the sample representative. Almost all respondents (99.8%) had secondary education or higher, 33.7% had post-secondary qualifications, and most were not employed (70.7%), which reflects recruitment in university settings. The average person in the AMVA had 10.4 years of education in 2019, less than complete secondary schooling (Medellín Cómo Vamos, 2021). The sample therefore overrepresents young people with higher education (Sect. 6).

Table 1 Characteristics of the sample ($n=516$)

Characteristic	Category	*n*	%
Age	18 to 20 years	344	66.7
	21 to 28 years	172	33.3
Gender	Women	249	48.3
	Men	262	50.8
	Non-binary	1	0.2
	Prefer not to answer	4	0.8
Area of residence	Urban	482	93.4
	Rural	34	6.6
Socioeconomic stratum*	1 to 3	189	36.6
	4 to 6	326	63.2
	Not reported	1	0.2
Highest education	Primary	1	0.2
	Secondary	341	66.1
	Technical or technological	76	14.7
	Professional (university)	85	16.5
	Postgraduate	13	2.5
Employment	Not employed	365	70.7
	Employed	151	29.3
Population group	None	428	82.9
	LGBTIQ+	48	9.3
	Other	40	7.8

* The socioeconomic strata system is a classification system that divides residential properties into six levels, from the lowest to the highest. It is primarily used to determine how much households contribute toward public utility services and how subsidies are allocated

Connection with nature

Most respondents felt connected to nature and the environment in their daily lives (86.6% agreed or strongly agreed; Fig. 1), and 98.1% considered that human well-being depends on nature being healthy. Connection with nature (four categories) was associated with nine of the fourteen emotions after Holm correction: sad ($V=0.25$), anxious (0.19), angry (0.18), hurt (0.18), depressed (0.17), powerless (0.16), helpless (0.16), guilty (0.14) and grief (0.13). In every case the emotion was more frequent among those

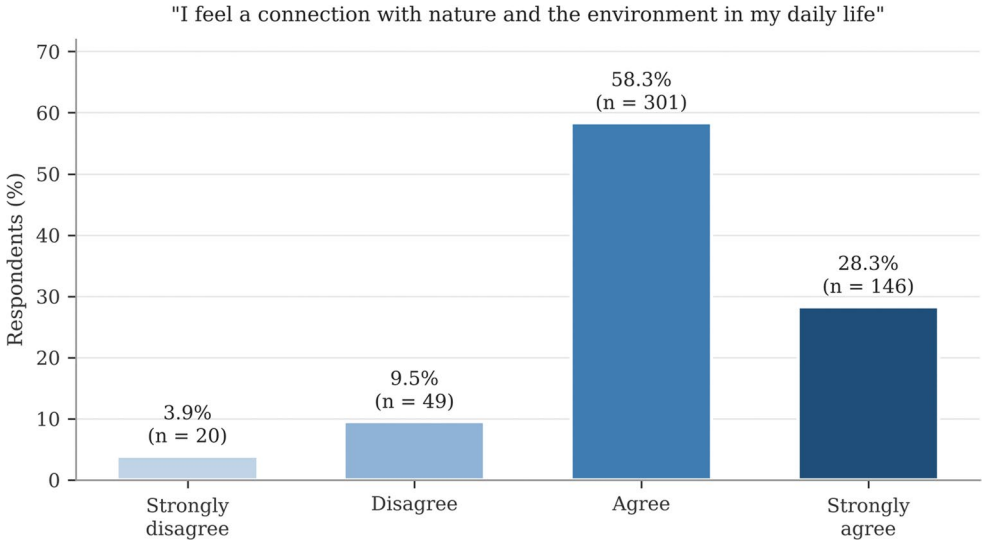


Fig. 1 Distribution by connection with nature

who felt connected; for example, 34.7% of those who agreed with the item felt very sad, against 17.4% of those who disagreed. The effect sizes are small, and because 86.6% agreed with the single item, there is little variation in this measure. Associations with fear, shame, despair, optimism and indifference did not remain significant after correction.

Eco-emotions

Most respondents said they feel affected by the impacts of climate change and ecological degradation (85.5%), had noticed harmful changes in the climate or natural disasters in Colombia in the last five years (95.0%) and worry about the threats these pose to people and the planet (91.3%). Almost all think about the long-term consequences of human activity (98.6%), but most do so weekly or rarely (77.1%). Over a third said that their feelings about climate change negatively affect their daily life (37.2%) and that these feelings influence their mental health somewhat or a lot (35.3%). Many feel overwhelmed by the amount of environmental news and information (61.2%). When they have tried to talk about these issues, 25.2% felt ignored by others, and 36.4% said they do not talk about them.

Emotions by group

Table 2 shows responses to the question "To what extent do climate change and ecological degradation make you feel any of the following emotions?". Sorrow and fear were the most widespread: 86.2% felt sad and 81.8% afraid to at least some extent. Powerlessness was also very common (powerless 77.7%, despair 72.1%, helpless 62.6%), and feeling powerless was the emotion most often reported as "a

Table 2 Eco-emotions by conceptual group, with the values of Hickman et al. (2021) as a descriptive reference

Group	Emotion	A lot (%)	Somewhat (%)	A lot + somewhat (%)	Hickman et al. (2021): Yes (%)
Anxiety and fear	Afraid	32.0	49.8	81.8	67.3
	Anxious	22.9	48.6	71.5	61.8
Sorrow	Sad	32.4	53.9	86.2	66.7
	Grief	7.8	46.9	54.7	41.5
	Hurt	8.3	34.7	43.0	42.8
	Depressed	3.9	34.3	38.2	38.6
Anger	Angry	24.2	44.4	68.6	56.8
Guilt and shame	Guilty	16.7	59.7	76.4	50.2
	Ashamed	10.3	40.7	51.0	45.6
Powerlessness	Powerless	38.6	39.1	77.7	56.0
	Despair	20.5	51.6	72.1	44.2
	Helpless	14.0	48.6	62.6	50.9
Positive or detached	Optimistic	6.8	43.2	50.0	30.9
	Indifferent	3.9	25.6	29.5	29.0

Table 3 Beliefs about the future, with the values of Hickman et al. (2021) as a descriptive reference

Statement	Hickman: Yes (%)	Hickman: No (%)	Hickman: Prefer not to say (%)	This study: Yes (%)	This study: No (%)
People have failed to take care of the planet	82.6	15.3	2.1	93.8	6.2
The future is frightening	75.5	22.2	2.3	75.8	24.2
Humanity is doomed	55.7	40.7	3.7	73.6	26.4
My family's security will be threatened	51.7	45.2	3.2	67.1	32.9
I am hesitant to have children	39.1	57.0	3.9	58.5	41.5
The things I most value will be destroyed	54.8	41.6	3.6	58.1	41.9
I won't have access to the same opportunities that my parents had	54.9	42.1	3.0	56.4	43.6

lot" (38.6%). Self-directed emotions were frequent (guilty 76.4%, ashamed 51.0%), mostly at the "somewhat" level, and anger was reported by 68.6%. Half of the respondents felt optimistic and 29.5% indifferent.

Most respondents also expressed negative expectations about the future (Table 3): that people have failed to take care of the planet (93.8%), that the future is frightening (75.8%), that humanity is doomed (73.6%) and that their family's security will be threatened (67.1%). More than half were hesitant to have children (58.5%) and expected that the things they most value will be destroyed (58.1%) and that they will not have their parents' opportunities (56.4%).

Co-occurrence of emotions

Table 4 shows the Spearman correlations among the fourteen items. The twelve negative emotions were all positively correlated with one another (rho between 0.22 and 0.52, median 0.37), with the strongest links between despair and grief (0.52), grief and hurt (0.49), grief and depressed (0.48), and helpless and sad (0.45). Guilt and shame were correlated with each other (0.41) but less strongly with the other emotions (0.22 to 0.35), which is consistent with their self-directed character. Guilt and anger, the self-directed and other-directed emotions of the moral injury framework, were only weakly correlated (0.25), less than most other pairs of negative emotions. Optimism was essentially unrelated to the negative emotions (rho between −0.11 and 0.12), and indifference was weakly negatively related to sadness, anger, fear and powerlessness (-0.17 to -0.23). Identifying distinct emotional profiles would require validated multi-item scales and techniques such as latent profile analysis, which we leave for future research.

Table 4 Spearman correlations among the fourteen emotion items (0 = not at all, 1 = somewhat, 2 = a lot)

	Afr	Anx	Sad	Gri	Hur	Dep	Ang	Gui	Ash	Pow	Des	Hel	Opt	Ind
Afraid	1													
Anxious	0.43	1												
Sad	0.44	0.39	1											
Grief	0.37	0.43	0.42	1										
Hurt	0.28	0.32	0.41	0.49	1									
Depressed	0.31	0.44	0.34	0.48	0.43	1								
Angry	0.37	0.31	0.43	0.42	0.36	0.28	1							
Guilty	0.35	0.27	0.28	0.31	0.32	0.25	0.25	1						
Ashamed	0.28	0.27	0.25	0.31	0.39	0.25	0.35	0.41	1					
Powerless	0.41	0.43	0.37	0.43	0.29	0.34	0.42	0.29	0.27	1				
Despair	0.44	0.41	0.40	0.52	0.35	0.41	0.40	0.27	0.22	0.44	1			
Helpless	0.30	0.37	0.45	0.42	0.42	0.33	0.32	0.24	0.24	0.31	0.37	1		
Optimistic	0.01	0.03	0.07	0.03	0.10	−0.01	0.03	0.08	0.12	−0.01	−0.11	−0.01	1	
Indifferent	−0.18	−0.12	−0.23	−0.10	−0.04	−0.02	−0.19	−0.01	−0.02	−0.17	−0.08	−0.10	0.13	1

Gender differences

Women reported every negative emotion more often than men, and men reported optimism more often (Table 5). After Holm correction across the 33 gender comparisons, the differences were significant for anxious (81.9% of women against 61.5% of men, V = 0.29), sad (0.25), afraid (0.22), powerless (0.20), despair (0.20), depressed (0.19), guilty (0.18), optimistic (55.0% of men against 45.0% of women, V = 0.17), angry (0.17) and grief (0.16), but not for helpless, hurt, ashamed or indifferent. Women were also more likely to be hesitant to have children (69.1% against 48.9%, V = 0.21), to expect that the things they most value will be destroyed (69.1% against 47.7%, V = 0.22) and that their family's security will be threatened (V = 0.14), and to say that their feelings influence their mental health (47.0% against 24.0% somewhat or a lot, V = 0.24). In contrast, beliefs about local government did not differ by gender after correction, and neither did participation in environmental initiatives (28.9% of women, 25.2% of men). The single non-binary respondent and the four who preferred not to state their gender are not included.

Table 5 Eco-emotions and selected beliefs by gender (women $n = 249$, men $n = 262$)

Item (% "a lot" or "somewhat"; for beliefs, % Yes)	Women	Men	Cramér's V	Holm-adjusted p
Afraid	89.6	74.4	0.22	< 0.001
Anxious	81.9	61.5	0.29	< 0.001
Sad	92.8	80.5	0.25	< 0.001
Grief	61.0	48.9	0.16	0.039
Hurt	48.1	38.2	0.15	0.052
Depressed	47.8	29.0	0.19	0.002
Angry	75.9	62.2	0.17	0.021
Guilty	81.5	72.5	0.18	0.005
Ashamed	55.0	47.7	0.08	1.000
Powerless	84.3	71.8	0.20	0.001
Despair	81.1	64.1	0.20	0.001
Helpless	66.3	59.1	0.12	0.296
Optimistic	45.0	55.0	0.17	0.019
Indifferent	25.3	33.2	0.10	0.911
I am hesitant to have children	69.1	48.9	0.21	< 0.001
The things I most value will be destroyed	69.1	47.7	0.22	< 0.001
My family's security will be threatened	73.9	61.1	0.14	0.040
Feelings negatively affect my daily life	43.4	31.3	0.13	0.081
Local government can be trusted	10.0	15.3	0.08	1.000
Participates in environmental initiatives	28.9	25.2	0.04	1.000

Perception of institutions

Local government

Almost half of the respondents (48.4%) were not at all reassured by their local government's response to climate change and ecological degradation, and only 5.8% were very reassured. Beliefs about local government were predominantly negative or uncertain (Table 6). Only 12.4% think it is doing enough to avoid a climate catastrophe (60.7% think it is not), 12.6% think it takes their concerns seriously enough, and 13.0% think it can be trusted (50.0% think it cannot). On the negatively worded statements, 46.7% think their local government is failing young people, 44.2% that it is lying about the effectiveness of its actions and 42.8% that it is betraying them or future generations; between 14.1% and 17.2% disagreed. A notable feature is the share of "I don't know" answers, from 26.9% (doing enough) to 41.7% (acting in line with climate science; lying about effectiveness). This share did not differ meaningfully by gender (on average 3.4 "I don't know" answers out of nine among men and 3.2 among women) and was slightly higher among respondents with secondary education only (3.5) than among those with post-secondary education (3.0).

Emotions varied little with trust in local government. Among those who trust it, do not trust it and do not know, respectively, 73.1%, 75.6% and 65.4% felt anxious, 61.2%, 69.8% and 69.6% felt angry, and 71.6%, 81.4% and 74.9% felt powerless; none of these differences was significant after Holm correction (V between 0.07 and 0.08). Only despair differed (62.7%, 76.0% and 70.2%; V = 0.12, adjusted $p = 0.030$). The same pattern held within strata of gender, educational level and connection with nature, with one exception: among the 69 respondents who did not feel connected to nature, those who distrusted their local government more often reported anger and despair (V = 0.29 to 0.31, unadjusted $p = 0.01$ to 0.02), a result based on a small group that should be read with caution.

Government and companies compared

Two similarly worded questions asked how respondents feel about the way local government and companies are responding (Table 7). Towards both, negative emotions predominated and positive ones were rare: about six in ten did not feel protected (61.8% for companies, 58.7% for government) or valued (61.8% and 62.4%) at all, and fewer than 3.5% felt very protected or valued by either. The difference lies in the intensity of negative emotions. The share feeling

Table 6 Beliefs about the response of local government, with the values of Hickman et al. (2021) for government in general as a descriptive reference

Statement	Hickman: Yes (%)	Hickman: No (%)	Hickman: Prefer not to say (%)	This study: Yes (%)	This study: No (%)	This study: I don't know (%)
Taking my concerns seriously enough	30.0	63.8	6.2	12.6	49.4	37.9
Doing enough to avoid climate catastrophe	30.8	64.4	4.8	12.4	60.7	26.9
Dismissing people's distress	60.1	34.0	5.9	39.9	25.2	34.9
Acting in line with climate science	36.5	57.2	6.4	21.7	36.6	41.7
Protecting me, the planet and/or future generations	33.1	61.0	5.9	15.9	48.3	35.9
Can be trusted	31.3	61.6	7.2	13.0	50.0	37.0
Lying about the effectiveness of their actions	64.4	28.9	6.7	44.2	14.1	41.7
Failing young people	64.9	29.8	5.3	46.7	16.7	36.6
Betraying me and/or future generations	58.5	34.7	6.9	42.8	17.2	39.9

Table 7 Emotions about the response of companies and of local government (%)

Emotion	Companies: A lot	Companies: Somewhat	Companies: Not at all	Government: A lot	Government: Somewhat	Government: Not at all
Anguished	31.8	45.2	23.1	14.9	55.0	30.0
Abandoned	22.5	36.0	41.5	17.8	44.8	37.4
Afraid	26.0	44.4	29.7	15.7	48.3	36.0
Hopeful	7.4	45.5	47.1	5.2	43.2	51.6
Angry	22.9	38.8	38.4	14.7	41.9	43.4
Valued	2.9	35.1	61.8	3.1	34.5	62.4
Ashamed	14.1	30.8	55.0	10.3	30.0	59.7
Belittled	16.3	38.8	45.0	10.5	40.3	49.2
Protected	2.1	36.0	61.8	2.5	38.8	58.7

"a lot" anguished, afraid and angry was higher for companies (31.8%, 26.0% and 22.9%) than for local government (14.9%, 15.7% and 14.7%), while feeling abandoned to some extent was slightly more common towards government (62.6% against 58.5%).

Education system

Most respondents consider that there is scientific consensus on the causes of climate change (62.4%), but 22.5% do not know and 15.1% think there is none. Just over half (51.2%) rated the performance of the formal education system in educating young people about climate change and ecological degradation as bad or very bad; 45.7% rated it good and 3.1% very good.

Action competence, participation and support

Three quarters of respondents (75.4%) know ways to fight climate change and ecological degradation, 81.4% agree that their individual actions can help, and 90.5% want to start implementing actions; 83.3% have changed their lifestyle because of their concerns. Although 96.5% believe that collective and community action can help, only 27.1% are actively involved in environmental initiatives or organisations.

Knowledge of action possibilities and confidence in one's own influence were not associated with any of the emotions examined (anxious, powerless, despair, angry, optimistic; V between 0.03 and 0.12, all adjusted $p > 0.12$) nor with participation (28.8% of those with knowledge against 22.0% without; 27.9% of the confident against 24.0%). Willingness to act was associated with anxiety and anger: 73.9% of those willing to act felt anxious against 49.0% of the few who were not (V = 0.16, adjusted $p = 0.006$), and 70.7% against 49.0% felt angry (V = 0.14, $p = 0.025$); it was unrelated to participation. Participation itself was not associated with any emotion after correction (V between 0.03 and 0.15), nor with gender, age group or employment. It was more frequent among respondents with post-secondary education (36.2% against 22.5%, V = 0.15, $p < 0.001$) and among those connected to nature (29.3% against 13.0%, V = 0.12, $p = 0.005$), and participants were more likely to have changed their lifestyle (94.3% against 79.3%). Rural respondents ($n = 34$)

reported broadly similar emotions and participation (26.5%) to urban respondents, with somewhat more helplessness (82.4% against 61.2%) and less optimism (32.4% against 51.2%); no tests were performed on this group.

When asked about what kind of support would help them cope with their feelings, respondents most often chose socioenvironmental volunteering (46.3%), exchanges with people who lead organisations confronting the crisis (45.7%) and courses and workshops on existing solutions (42.6%); 18.8% said no support was needed. Half (49.4%) felt that family and friends support them with their environmental concerns, 35.1% did not, and 15.5% said they had no such concerns.

Discussion

A spectrum of emotions, not only anxiety

Anxiety was not the most frequent emotion in our sample: sadness and fear were more common, and powerlessness was the emotion most often felt intensely. This supports describing young people's distress as a set of distinct eco-emotions rather than as eco-anxiety alone (Sect. 2.1). The pattern resembles findings among Brazilian youth, who described mainly sadness, despair and anxiety (Schor et al. 2025), and whose three most frequent emotions in the ten-country survey were fear, sadness and anger (Clayton et al. 2023).

The correlation matrix (Table 4) shows how these emotions relate to each other. The negative emotions form one moderately correlated set: young people who report one tend to report the others. Guilt and shame are the exception, as they are more weakly related to the rest; in particular, guilt and anger, the self-directed and other-directed emotions of the moral injury framework, were only weakly correlated. Optimism was unrelated to the negative emotions: half of the respondents felt optimistic, and most of them also felt sad, afraid or powerless. Hope and distress therefore coexist, and hope can support coping and action (Thomaes 2026).

Respondents who felt connected to nature reported several negative emotions more often, although the associations were small. As explained in Sect. 2.3, this is expected: people who value nature experience its degradation as a loss, so connection can intensify eco-emotions while remaining a resource. Our data add one element: respondents connected to nature were more than twice as likely to take part in environmental initiatives. This is consistent with the suggestion that an emotional connection with nature becomes a source of resilience when it comes with concrete opportunities to act (Guillén Aguirre and Dorado Alem 2025). Because the study is cross-sectional and did not measure well-being or coping, these are associations, not effects.

Institutions, betrayal and moral injury

Few respondents believe that their local government takes their concerns seriously, does enough or can be trusted, and more than four in ten believe it is failing young people, lying about its actions or betraying future generations. In the terms of the moral injury framework (Sect. 2.2), these beliefs correspond to other-directed injury, and the small number of respondents who feel protected or valued by government or companies fits the description of youth climate distress as social suffering caused by societal inaction (Murray et al. 2026).

However, emotions hardly varied with trust in local government: respondents who trusted it were almost as likely to feel anxious, angry or powerless as those who did not, and only despair differed. Hickman et al. (2021), by contrast, found that distress was correlated with negative views of government. One possible explanation is the referent: their questions concerned governments in general, whereas ours concerned local government, which young people may not see as a main actor in the climate crisis. The moral injury framework therefore helps to read the pattern of beliefs, but our data do not show that judgements about local government are linked to how strongly young people feel.

Strong anguish, fear and anger were more frequent towards companies than towards local government. In appraisal terms (Sect. 2.2), this suggests that companies are seen as more directly responsible for environmental harm. It is consistent with Latin American cases in which corporate sustainability discourse coexists with displacement and environmental damage (Uribe-Sierra et al. 2024), and with the argument that eco-anxiety is feeding disillusionment with corporate social responsibility (Dauvergne and van der Ven 2026). The weaker emotions towards local government may reflect lower expectations, or a perception that it can do little about a global problem; our data cannot distinguish between these explanations.

Self-directed emotions were also frequent: three quarters of respondents felt guilty and half felt ashamed. Henritze et al. (2023) argue that self-directed moral injury is heightened when responsibility for sustainability is framed as a matter of individual behaviour. This is relevant in a sample where most respondents have changed their lifestyle and where public messages often emphasise individual action.

Between a quarter and two fifths of respondents did not know how their local government was responding. The most plausible reading is uncertainty, not detachment or mistrust.

Possible causes, which future research could examine, are the low visibility of local climate action, limited access to information about it, and the low importance of local government in young people's thinking about these issues. Brazilian youth similarly described uncertainty linked to the lack of climate education (Schor et al. 2025). In practical terms, many young people not knowing whether their local government is acting is a communication problem in itself.

Gender

Women reported every negative emotion more often than men, were more hesitant to have children, more often expected the loss of what they value, and more often said that their feelings affect their mental health, with small to medium effect sizes; men more often felt optimistic. This mirrors the ten-country survey, in which gender differences were small but consistent, with women expressing more concern and negative emotions and men more optimism and faith in government (Clayton et al. 2023), and the Latin American survey in which men reported less eco-anxiety (Mejia et al. 2026). Unlike Clayton et al. (2023), we found no gender difference in beliefs about government, nor in participation. Explanations proposed in the literature include gender socialisation towards care and empathy, women's greater vulnerability to climate impacts, and a tendency among men to underreport emotions such as fear (Mejia et al. 2026); girls are also at higher risk after climate-related disasters (Giannakopoulos 2025). The gender gap in reported effects on mental health suggests that support services should expect higher demand from young women.

Why concern does not become collective action

Almost all respondents believe in collective action and most have changed their personal habits, but only about a quarter take part in environmental initiatives. Concern that does not become behaviour is common (Gifford 2011) and is often explained by low self-efficacy (Sect. 2.3). In our sample, however, knowledge of action possibilities and confidence in one's own influence were high and unrelated to participation. The same was true of the emotions: anxiety and anger were associated with wanting to act, but not with actually taking part. What distinguished participants was their education and their connection with nature, not what they felt or believed they could do.

Our survey did not ask about barriers, so we cannot say which ones operate, but several are plausible and should be examined directly. The first is safety: in the country with the most killings of environmental defenders in recent years (Sect. 1.1), visible engagement may feel risky even for urban young people far from the rural areas where most of this violence occurs. Part of their anxiety may therefore concern engagement itself, not only the crisis; as Henritze et al. (2023) argue, social position shapes not only what people feel but also what they consider possible to do. The second is low political efficacy and disillusionment, discussed as barriers for young people elsewhere (O'Callaghan et al. 2026) and compatible with the negative and uncertain views of local government in our data. The third is lack of institutional support for young people's engagement (Gan and Nathan 2025). The fourth is practical: time, money and accessible spaces. The supports our respondents asked for (volunteering, contact with people who lead organisations, and workshops on solutions) point in the same direction: what is missing may be accessible, safe and credible ways to act with others, rather than motivation. Ogunbode et al. (2022) found that climate anxiety is more strongly linked to action in wealthier, more individualistic countries, which also suggests that structural conditions shape whether emotions turn into action. At the same time, encouraging participation should not place the burden of change on young people alone (Gunasiri et al. 2026).

The Valle de Aburrá within Colombia

Our findings come from an industrialised urban valley and cannot be extended to rural Colombia. In terms of the pathways described in Sect. 2.3 (Giannakopoulos 2025), exposure in our sample is mainly chronic and existential: young people live with visible local problems, such as recurrent air-quality alerts, and receive information about national and global impacts. This differs from the rural and Indigenous communities reviewed in Sect. 2.4, where environmental change directly affects livelihoods, food and cultural identity. Our data allow only a tentative comparison: the 34 rural respondents felt helpless more often and optimistic less often than urban respondents, but the group is too small for conclusions. Applying the same instrument in different Colombian territories would show whether the pattern we describe is specific to urban, educated young people.

Education

Half of the respondents rated the formal education system negatively, and more than a third did not affirm the scientific consensus on the causes of climate change, although almost all had secondary education or higher. Young people in Brazil (Schor et al. 2025) and Israel (Gan and Nathan 2025) make similar criticisms of their schools. A meta-analysis of 169 studies shows that environmental education reliably improves knowledge, attitudes and behaviour (Thomaes 2026). A coherent national policy for sustained environmental education is needed, and academic spaces should serve as platforms for action (Stickney and Skilbeck 2020).

There is an opposing view. Amos and Rowe (2026) argue that climate content in school curricula causes distress and should be removed until it is shown to be safe. Our data do not support treating education as the source of distress in this population: respondents judged the education they received as poor, not as alarming. The concern does show that content and tone matter: conveying hope and perspective appears more empowering than messages of doom (Thomaes 2026), and education can include space for emotions and for collective action (Frota et al. 2025; Galway et al. 2026).

Limitations

This study has six main limitations. First, it uses a convenience sample recruited mainly in universities: almost all respondents had secondary education or higher and 63.2% lived in socioeconomic strata 4 to 6. The results therefore describe this group, not all young people in the AMVA, and participation is probably lower in the wider population, since it was higher among the more educated. Second, the comparison with Hickman et al. (2021) is descriptive only, because the surveys differ in population, year and response format (Sect. 3.2). Third, emotions and connection with nature were measured with single items, the emotion groups are conceptual, and behaviours were self-reported. Fourth, the analyses are cross-sectional and bivariate, so they show associations, not causes, and factors we did not measure, such as direct experience of disasters or media use, may explain part of them. Fifth, the survey did not ask about barriers to participation or perceived safety, so the explanations in Sect. 5.4 are interpretations to be tested. Sixth, the data reflect a single moment, mid-2024, shortly after the El Niño emergency; the rural subgroup was too small ($n = 34$) for conclusions. Future studies should use validated multi-item measures, include young people with less formal education and from rural areas, and ask directly about barriers to collective action.

Conclusions and implications

Young people in this sample feel a range of eco-emotions, mainly sorrow, fear, powerlessness and guilt, which coexist with optimism; women are more affected than men. They see the responses of local government, companies and the education system as insufficient, or do not know what those responses are. They are willing to act and have changed their habits, but few take part in collective initiatives, and neither their emotions nor their sense of competence explains who does.

These findings point to five concrete implications. First, climate education should combine science with local solutions, space to talk about emotions and opportunities to act, and teachers need training to provide it. Second, local governments, the AMVA and universities should offer young people simple, safe and visible ways to act together, such as volunteering, contact with environmental organisations and workshops on solutions, which are the forms of support respondents themselves asked for. Third, local governments should report their climate action regularly and in accessible formats, since many young people do not know what is being done. Fourth, university well-being services should be prepared to support young people's eco-emotions without treating them as illness, particularly among young women; since a third of respondents do not feel supported by family and friends, encouraging conversations about these issues at home may also help (Bureau et al. 2026). Fifth, companies should expect young people to demand accountability and should respond with verifiable action rather than communication campaigns.

Ethical considerations

This research was conducted under ethical guidelines to protect the rights and well-being of participants. All respondents were adults aged 18 to 28 who consented after being informed about the study's objectives, its voluntary nature and their right to withdraw at any time. Participation was anonymous, and no identifiable personal data were analysed. The study was independently financed for academic and advocacy purposes. During the preparation and revision of this manuscript, the authors used Claude (Anthropic) to draft and edit parts of the text, to run and check the descriptive and bivariate statistical analyses reported in Sect. 4, and to prepare Fig. 1. All analyses were completed by the authors (STATA was used for statistical calculations), and all content was reviewed, edited and approved by them, who take full responsibility for the manuscript.

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Data availability The survey instrument is included in the supplementary materials. The collected data is available from the authors upon reasonable request.

Declarations

Competing interests The authors declare that there are no competing interests related to this research.

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