

RESEARCH ARTICLE

Psychological effects of climate change media exposure on climate change worry: The moderating role of coping strategies in Italian emerging adults

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Abstract

Background: Climate change is one of the most pressing global challenges of the 21st century. Climate-related information is widely disseminated through mass media, particularly social media. Exposure to such content can elicit emotional responses and contribute to climate-change-related psychological states, including eco-worry.

Objective: This study aims to investigate exposure to climate-change-related information among Italian emerging adults, focusing on information sources, related emotional responses, and the moderating role of problem-focused, de-emphasizing/avoidant, and meaning-focused coping strategies in the relationship between media exposure and eco-worry.

Methods: A total of 642 Italian emerging adults aged 18–30 years (mean = 22.84, standard deviation = 3.06; 62.1% female) completed self-report measures assessing exposure to climate-change-related information, information sources, emotional reactions, eco-worry, and coping strategies. Moderation analyses were conducted to evaluate the protective and risk roles of different coping strategies.

Results: Exposure to climate-change-related information predominantly elicited negative emotions, particularly anger, guilt, and helplessness, whereas positive emotions were less frequent. Participants generally perceived climate change information as broad and generic, with social media emerging as the primary information source. Compared with traditional media, social media exposure was associated with higher levels of eco-worry and negative affect. Problem-focused and meaning-focused coping strategies attenuated the relationship between information exposure and eco-worry, whereas de-emphasizing and avoidant coping strategies strengthened this association.

Conclusion: The findings highlight the role of media exposure in shaping the psychological impact of climate change in the Italian context. They also provide support for interventions promoting adaptive coping strategies and suggest directions for future research.

Keywords: Climate change; Media information exposure; Climate-change worry; Negative affects; Coping strategies; Emerging adults; Mental health

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1. Introduction

The increasing frequency of extreme weather events, environmental disasters, territories rendered uninhabitable due to climate vulnerability, and disruptions to food systems profoundly affect human life and health, making climate change one of the most serious present and future threats.^{1,2} In recent years, Europe has experienced a rise in temperatures at a faster rate than the global average, along with an increase in extreme climatic events and pollution-related mortality.³ The Mediterranean area of Europe, which includes Italy, is particularly vulnerable to the effects of climate change, resulting in substantial ecological, economic, social, and psychological consequences.^{4,5} The literature consistently highlights that climate change affects both physical and mental health, contributing to malnutrition, physical and immunological illnesses, psychological distress, and increased rates of suicide and violence.^{6,7} Several studies have shown that awareness of the climate change crisis is associated with environmental emotions and psychological distress.^{8–11} Evidence suggests that the impact on mental health is both direct—stemming from personal experiences of extreme events or natural disasters—and indirect, mediated by exposure to news, images, and videos through the media.¹²

The Media and Climate Change Observatory¹³ reported a substantial increase in the circulation of climate-change-related information in both international and local press, a trend already documented between 1996 and 2012 by a comparative study conducted across 27 countries and confirmed by more recent assessments.¹⁴ These findings also indicate that media coverage intensifies markedly during extreme climatic events and related political and social crises, thereby amplifying exposure to emotionally salient content and potentially contributing to heightened concern among audiences.^{13,15,16} Similar characteristics are observed in the coverage of climate change by both mass media and social media in Italy, which is often marked by generalized and insufficiently in-depth reporting.^{17,18}

1.1. Psychological impacts of media exposure to climate change

The media represent one of the primary channels through which knowledge about climate change is constructed, providing tools that can enhance understanding of the phenomenon and support the adoption of pro-environmental behaviors aimed at mitigating its impacts.^{19–21} However, media communication—often characterized by the use of terms such as “catastrophic,” “urgent,” and “rapid”—tends to rely on dramatic language and vivid imagery, thereby contributing to the consolidation of an alarmist framing of the phenomenon.²²

Indeed, exposure to threatening informational content may elicit intense negative emotional responses, which in addition to hindering the process of understanding the phenomenon, may undermine perceived self-efficacy and, consequently, increase eco anxiety and eco worry.^{19,23,24} Moreover, traditional media can represent climate change inaccurately, and social media may contribute to the dissemination of alarmist, anxiety-provoking, and often superficial narratives²⁵, particularly when relied upon as exclusive sources of information.²⁶

In line with recent research on other potentially traumatic phenomena in the present-day context,^{27–29} exposure to anxiety-inducing media content may give rise to processes of vicarious traumatization (as discussed in Multilevel Trauma Theory³⁰). Moreover, given that individuals’ engagement with the climate crisis is predominantly indirect, namely mediated through media representations rather than through personal experience,³¹ both the level and the quality of media exposure emerge as psychologically relevant factors in examining the impact of the climate crisis on psychological well-being.

The literature suggests that emerging adults, who are already navigating a sensitive phase of developmental transition characterized by identity exploration and heightened emotional reactivity,^{32,33} exhibit increased interest in climate change.³⁴ For emerging adults in particular, digital and social media represent the most common channels through which they encounter information about climate change, and such exposure has been shown to be closely associated with emotional responses.^{35,36} Among the various information sources, large-scale survey data indicate that social media are the most frequently reported source of climate change information among youth, surpassing traditional media such as television and newspapers.³⁷ Similarly, Arnot *et al.*³⁸ highlight the central role of social media in facilitating engagement with climate issues and in shaping young people’s understanding of and responses to environmental challenges.

As previously noted, media content may support the development of knowledge, awareness, and pro-environmental behaviors.^{20,21} However, empirical evidence also indicates that emerging adults report forms of climate change-related psychological distress, including psychoterratic states such as eco-anxiety and eco-worry,^{9,11,39–41} which appear to be amplified by media exposure.⁴² The latter has been associated with internalizing problems such as anxiety and depression,⁴³ as well as with various forms of psychological suffering, which are intensified by highly emotionally impactful images and videos.⁴⁴

Moreover, media exposure tends to amplify negative emotions—such as anger, fear, guilt, and feelings of helplessness—more than positive affect, including hope, determination, and proactivity.³⁵ Consequently, excessive media exposure and the quality of its content may generate emotional overload, potentially triggering counterproductive defensive responses, such as denial and problem avoidance.^{45–47} Therefore, it is crucial to investigate the strategies adopted by emerging adults to cope with highly emotionally impactful media content, such as that related to the climate crisis, insofar as their emotional and cognitive processing may influence their role—whether functional or otherwise—and its overall impact.

1.2. Coping strategies and climate information: Psychological responses to the threat

In recent years, both qualitative and quantitative research have shown increasing interest in the ways in which individuals cope with the threat posed by climate change, identifying specific coping strategies.^{48–50} Coping can be defined as the set of cognitive and/or behavioral efforts undertaken to manage external and/or internal demands that are appraised as threatening, stressful, or potentially harmful, in the present or in the future.⁵¹ Among the main strategies for coping with the climate threat, problem-focused coping aims to directly address the source of stress, for example by seeking information, discussing the issue with family members and friends, or adopting behaviors oriented toward reducing the stressor.^{49,50} This strategy is generally considered functional—especially when the threat is perceived as controllable—and is associated with greater psychological well-being.^{51,52}

However, in the case of climate change, problem-focused coping may serve substantially different functions: as a global, distal, and difficult-to-manage phenomenon, climate change is associated with higher levels of worry and distress.^{53,54} Because problem-focused coping promotes active information seeking while supporting self-regulation and self-efficacy,^{55,56} it may mitigate the emotional escalation induced by threatening news. Emotion-focused coping encompasses strategies aimed at regulating emotional responses without modifying the source of stress, including minimization, relativization, or denial of the problem.⁵⁴

To assess this coping strategy, Ojala^{49,53} originally developed items labeling the factor in which they loaded as “De-emphasising/Don’t care.” More recently, since some items within this dimension reflected an avoidance component that may have been implicitly captured by the “don’t care” label, Syropoulos *et al.*⁵⁷ labeled this strategy as “Avoidant,” without taking into account the threat

de-emphasis dimension, which Ojala considered highly relevant. This dimension includes items that clearly reflect both threat de-emphasis (e.g., “I think climate change is something positive because the summers will get warmer”) and active avoidance (e.g., “I don’t care since I don’t know much about climate change”). As these two aspects are partially overlapping, as suggested by the original statistical analyses, in the Italian adaptation of the coping strategies scale,⁵⁰ the strategy was labeled de-emphasizing/avoidant coping strategy. This naming preserves Ojala’s original conceptualization while simultaneously clarifying and making the initial “don’t care” component more comprehensible.

Although these strategies are generally associated with lower psychological well-being,^{58,59} within the context of climate change they may temporarily alleviate emotional distress, thus becoming functional in coping with the stressor. Indeed, a study conducted by Metag *et al.*⁶⁰ showed that doubting or denying the climate threat is associated with lower exposure to information and reduced negative emotions.⁵⁴ However, de-emphasization and avoidance may hinder adequate processing of anxiety-provoking news and, in the absence of more active strategies such as problem-focused coping, may increase emotional impact over time. In fact, as demonstrated by studies conducted in domains other than the climate crisis, avoidant and de-emphasizing strategies are associated with greater psychological suffering.^{61–63} Finally, meaning-focused coping⁵³ is a strategy centered on a positive reappraisal of the climate threat, fostering hope, trust, and an understanding of the phenomenon within a broader historical framework among social actors.⁵⁶ This strategy appears particularly adaptive in situations characterized by low controllability, such as the climate crisis, as it facilitates meaning making and identifies elements of possibility and change, exerting a protective effect on worry and distress.^{53,56}

Building on the literature discussed above, it is reasonable to hypothesize that exposure to climate-change-related information may increase eco-worry, as news, images, and videos related to climate threats can heighten risk perception, increase awareness of the issue, and contribute to psychological distress. However, this relationship may vary depending on specific individual characteristics, such as coping strategies.

In line with general coping theory⁵¹ and its application to climate-related threats,^{49,50,53} individuals’ cognitive and emotional strategies may influence the extent to which exposure to climate information translates into eco-worry. In this regard, problem-focused coping, meaning-focused coping, and de-emphasizing/avoidant coping may represent potential factors that moderate this association.

Consistent with the exploratory nature of the present study and the limited empirical evidence available in the Italian context, these strategies are therefore examined as potential moderating variables in the relationship between exposure to climate change information and eco-worry.

Exploring how different coping strategies interact with exposure to climate-change-related information is particularly relevant for identifying emerging adults who are most vulnerable to climate-related worry and distress, as well as for clarifying the psychological processes that may either exacerbate or attenuate these responses. This line of research, which remains underexplored in the Italian context, is also crucial for distinguishing adaptive from maladaptive coping patterns within the context of a global and persistent environmental stressor, and for informing the development of targeted, evidence-based informational and preventive interventions aimed at reducing psychological distress and promoting more adaptive engagement with climate-related information.

1.3. Study design: Aims and research questions

In line with the literature review, the present study aims to investigate exposure to climate change information by examining its emotional associations and the possible moderating role of coping strategies in a sample of Italian emerging adults. Prior research suggests that exposure to climate-change-related media content may increase negative emotional responses and eco-worry by enhancing the salience of perceived environmental risks.

However, evidence also indicates that these effects

are not uniform, as coping strategies may play a key role in shaping individual emotional responses, potentially buffering or amplifying the psychological impact of climate-related information.

As this area of research appears to be still largely underexplored within the Italian context, the study seeks to investigate and address several research questions informed by the existing literature. Specifically, the study addresses the following research questions:

- (i) R1: Does exposure primarily occur through social media or traditional media? Moreover, what is the perceived quality of the information to which young people are exposed?
- (ii) R2: Which emotions arise in response to exposure to climate change-related content?
- (iii) R3: Does problem-focused coping play a protective or risk-enhancing role in the relationship between climate change information exposure and climate change worry?
- (iv) R4: Does meaning-focused coping play a protective or risk-enhancing role in the relationship between climate change information exposure and climate change worry?
- (v) R5: Does de-emphasizing/avoidant coping play a protective or risk-enhancing role in the relationship between climate change information exposure and climate change worry?

The conceptual model of the study is presented in Figure 1.

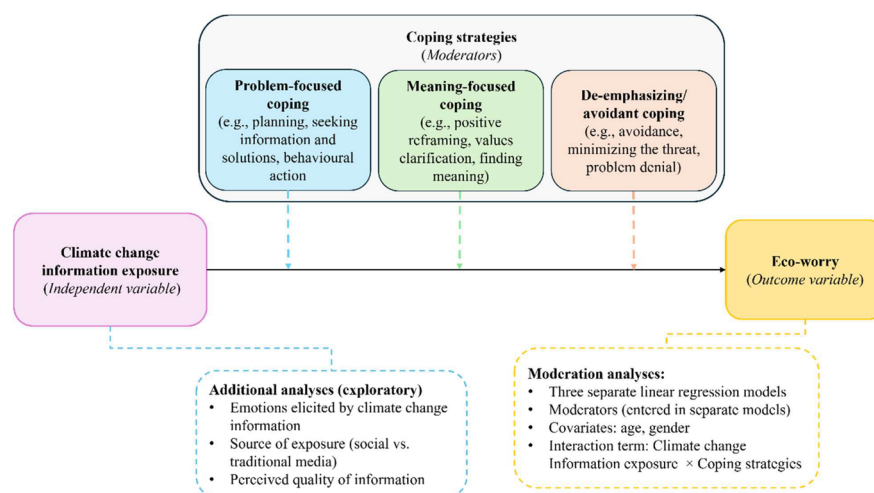


Figure 1. Conceptual model of the study. Dashed arrows indicate moderation effects. Additional variables were examined through separate exploratory analyses.

2. Methodology

2.1. Sample size determination

The sampling procedure was preceded by an a priori power analysis conducted using G*Power (version 3.1.9.6, Heinrich Heine University Düsseldorf, Germany). For the moderation models, assuming an effect size of $f^2 = 0.05$ (medium–small interaction), a desired power of 0.95, and an α level of 0.01, G*Power indicated a required sample of 460 participants.⁶⁴

2.2. Study procedure and participant selection

A sample of 662 Italian emerging adults was initially recruited. The preliminary analysis of missing values revealed no missing data and identified 20 multivariate outliers with elevated Mahalanobis distances (threshold value = 26.12, $p < 0.001$). These cases were carefully examined and removed to prevent substantial influence on subsequent analyses.

The final sample consisted of 642 Italian emerging adults (women = 399 [62.1%]; men = 243 [37.9%]), aged between 18 and 30 years (mean [M] = 22.84; standard deviation [SD] = 3.06). Most participants were from Southern Italy ($n = 560$, 87.2%), particularly from the Campania region ($n = 490$, 76.3%). In addition, the majority reported living in an urban area ($n = 416$, 64.8%), whereas the remaining 35.2% resided in rural settings, such as small towns or the countryside ($n = 226$).

Regarding relationship status, 47.8% of respondents reported being single ($n = 307$), while 52.2% indicated being in a romantic relationship ($n = 335$). With respect to educational level, 63.9% held a high school diploma ($n = 410$), 23.1% a bachelor's degree ($n = 148$), 10.7% a master's degree ($n = 69$), 2.2% a lower secondary school certificate ($n = 14$), and 0.2% an elementary school certificate ($n = 1$). At the time of data collection, 76% of the sample was enrolled in a university program ($n = 488$): 46.6% were pursuing humanities-related studies ($n = 299$), whereas 29.4% were engaged in science-related programs ($n = 189$). Only 7.5% of participants reported being members of environmental associations ($n = 48$), while 60.7% identified as religious ($n = 390$). Finally, regarding political orientation, 55.5% identified as left-wing ($n = 356$), 10.7% as centrist ($n = 69$), 4.2% as right-wing ($n = 27$), and 29.6% indicated no interest in politics ($n = 190$).

Participants were recruited in Italy between October 2024 and February 2025. Data were collected through a set of self-report measures administered via an online survey created with Google Forms. The survey was disseminated through posters displayed in common areas of the University of Naples and through announcements

shared on social media. A snowball sampling strategy was also employed, whereby individuals who completed the survey were invited to share the study with other potential participants within their social networks. To be eligible, participants were required to be between 18 and 30 years old, reside in Italy, and provide informed consent on the initial page of the online questionnaire.

2.3. Ethical considerations

All procedures described in this study were reviewed and approved by the Psychological Research Ethics Committee of the Department of Humanities at the University of Naples Federico II (protocol number 1-2023; approval date: 13 January 2023; scientific project manager: Giorgio Maria Regnoli). Prior to participation, all respondents were provided with detailed information regarding the aims of the study, as well as procedures related to data privacy and anonymity. Informed consent was obtained electronically from all participants on the first page of the online questionnaire before starting the survey. Participation was entirely voluntary and unpaid, and respondents were free to discontinue the survey at any time without penalty.

2.4. Measures

2.4.1. Sociodemographic information

Sociodemographic characteristics of the participants were assessed via ad hoc questionnaire examining gender, region of residence, type of residence (urban vs. rural), relationship status, education level, occupation, type of university course, membership in environmental associations, and political orientation.

2.4.2. Climate change information exposure

Climate change information exposure (CCIE) was assessed using a single item designed to measure the perceived frequency of exposure to climate-change-related information. Participants responded to the item “How often are you exposed to information (e.g., news, images, videos) about climate change?” on a five-point Likert scale (1 = never, 5 = daily). This item was developed following similar measures used to assess media exposure related to climate change in the “Media Exposure, Climate Anxiety, and Mental Health” project.⁶⁵

2.4.3. Source and perceived quality of climate change information

To assess the main media sources through which participants accessed climate change information, they were asked: “From which sources do you primarily obtain information, news, images, or videos about climate change?” Participants indicated the frequency of use for

two categories: (i) social media (e.g., Instagram, TikTok, Facebook, YouTube, and X [formerly Twitter]) and (ii) traditional and digital media (e.g., television, radio, podcasts, newspapers, and magazines, both online and print) on a five-point Likert scale (1 = never, 5 = very often). Frequency of exposure to expert versus general information was assessed using four additional items, also on a five-point Likert scale (1 = never, 5 = very often), across both media types. Specifically, the items measured how often participants encountered expert and general information via social media, and expert and general information via traditional and digital media.

2.4.4. Emotional responses of climate change information

Items were adapted from the Positive and Negative Affect Schedule⁶⁶ to capture emotional responses specifically elicited by climate change information, using a five-point Likert scale (1 = very little, 5 = very much). In addition to the original Positive and Negative Affect Schedule items (e.g., afraid, determined, and guilty), some items were modified or added to reflect context-specific emotions (e.g., hopeful, anxious, and helpless), in line with previous literature. The latent structure of the 13 items was examined through an exploratory factor analysis using maximum likelihood extraction and oblique (Direct Oblimin) rotation. The exploratory factor analysis revealed a two-factor solution explaining 55% of the total variance (48.2% after extraction), corresponding to positive and negative affect dimensions. Factor loadings were satisfactory (all > 0.45), confirming the coherence of the two dimensions, which was further supported by reliability indices of 0.815 (Cronbach's α) and 0.824 (McDonald's ω) for positive affect, and 0.851 (Cronbach's α) and 0.850 (McDonald's ω) for negative affect.

2.4.5. Climate change worry

To assess worry about climate change, the Climate Change Worry Scale (CCWS⁶⁷; Italian adaptation by Innocenti *et al.*,²³) was employed. This self-report instrument comprises 10 items rated on a five-point Likert scale (1 = never to 5 = always) and is designed to capture a unidimensional construct of climate-related worry, representing a cognitive facet of eco-anxiety characterized by repetitive thoughts about climate change. The items assess both personal worry and worry for the future of oneself and loved ones, for example: "Thoughts about climate change led me to worry about what the future may hold" and "I notice that I have been worrying about climate change." The Italian adaptation demonstrated strong psychometric properties and high internal consistency. In the present study, Cronbach's α and McDonald's ω were 0.900 and

0.898, respectively.

2.4.6. Climate change coping

To assess coping strategies for dealing with climate change, the Climate Change Coping Scale⁴⁹ (Italian adaptation by Regnoli *et al.*⁵⁰) was used. This self-report instrument is composed of 16 items rated on a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree) and is designed to assess three types of coping strategies related to climate change: (i) meaning-focused coping (e.g., "I have faith in humanity; we can fix all problems" or "I trust scientists to come up with a solution in the future"); (ii) problem-focused coping (e.g., "I search for information about what I can do" or "I talk with my family and friends about what one can do to help"); and (iii) de-emphasizing/avoidant coping (e.g., "I think that the problem is exaggerated" or "Climate change does not concern those of us living in Sweden"). The Italian adaptation demonstrated strong psychometric properties, strong evidence of internal and external validity, and good reliability for the three dimensions.⁵⁰

In this study, Cronbach's α and McDonald's ω for the meaning-focused coping dimension were 0.824 and 0.823, respectively, 0.931 and 0.927 for the problem-focused coping dimension, respectively, and 0.820 and 0.819 for the de-emphasizing/avoidant coping dimension, respectively.

2.5. Statistical analysis

Descriptive statistics, including means, SDs, skewness, and kurtosis, were computed. Skewness values within ± 2 and kurtosis values within ± 3 were considered indicative of approximately normal distributions, in line with Kline.⁶⁸ To determine whether mean differences across the variables of interest were statistically significant, paired-samples *t*-tests were conducted ($p < 0.05$); effect sizes were estimated using Cohen's *d*. Correlations among the variables and psychological constructs included in the study were examined using Pearson's coefficient ($p < 0.05$), and Steiger's *Z* test was performed to compare dependent correlation coefficients.

Based on these preliminary analyses, two linear regression models were estimated to assess the predictive strength of the two types of information sources examined (social media and traditional media) on negative emotions elicited by climate change information and on CCWS. Standardized beta coefficients (β), *t*-values, and R^2 were reported for both models ($p < 0.05$).

Before conducting moderation analyses, multicollinearity was assessed (tolerance > 0.1; variance inflation factor < 5.0), and the Durbin-Watson statistic indicated adequate independence of errors (approximately

2). Correlations among the variables in the moderation models were also examined using Pearson's coefficient.

The three moderation models were estimated using linear regression, with CCIE entered as the predictor and CCWS as the outcome. The three coping dimensions—problem-focused coping (model I), meaning-focused coping (model II), and de-emphasizing/avoidant coping (model III)—were included separately as moderators. Age and gender (coded as 0 for females and 1 for males) were included as covariates, and all variables were mean-centered prior to analysis. For each model, main effects and the interaction term between information exposure and the respective coping dimension were estimated. When significant interactions emerged ($p < 0.05$), simple slope analyses were conducted using the `sim_slopes` function in the `jtools` package, and Johnson–Neyman intervals were computed; interaction effects were also visualized using `interact_plot`. All analyses were conducted using SPSS version 30 (IBM, USA) and RStudio (version 2024.09.1; Posit Software, USA).^{69,70}

3. Results

3.1. Descriptive statistics

Table 1 presents the means, SDs, skewness, and kurtosis for all variables. Skewness and kurtosis values falling between ± 2 and ± 3 indicate that all variables, including

the psychological measures, approximate a normal distribution.

3.2. Climate change information exposure: Sources and perceived quality of information (RQ1)

Young participants reported encountering climate change content more frequently through social media ($M = 3.43$; $SD = 0.90$) than through traditional and digital media ($M = 3.05$; $SD = 0.93$). A t -test confirmed that this difference is statistically significant, indicating that social media represents the primary source of exposure for the emerging adults of this sample (mean difference = 0.376; $t_{[641]} = 9.458$; $p < 0.001$; Cohen's $d = 0.37$ [95% confidence interval (CI): 0.293, 0.453]).

For both sources—social media (mean difference = -0.340 ; $t_{[641]} = -6.642$; $p < 0.001$; Cohen's $d = -0.25$ [95% CI: -0.33 , -0.18]) and traditional and digital media (mean difference = -0.332 ; $t_{[641]} = -6.308$; $p < 0.001$; Cohen's $d = -0.25$ [95% CI: -0.32 , -0.17])—young participants reported encountering general information more frequently, whereas specialized and in-depth information was encountered less often across both sources.

3.3. Emotional responses of climate change information (RQ2 and RQ3)

As shown in Table 1, the news, images, and videos related to climate change that participants reported encountering

Table 1. Descriptive statistics ($n = 642$)

Variable	Mean	SD	Skewness	Kurtosis	Minimum	Maximum
CC information exposure	3.92	1.25	0.50	0.07	1	5
Source and perceived quality of CCI						
Social media ^a	3.43	0.90	-0.02	-0.38	1	5
Expert information	3.26	1.22	-0.82	-0.95	1	5
General information	3.60	1.01	-0.25	-0.48	1	5
Traditional and digital media ^b	3.05	0.93	0.03	-0.33	1	5
Expert information	2.89	1.16	0.14	-0.84	1	5
General information	3.22	1.13	-0.09	-0.77	1	5
Emotional responses of CCI						
Positive affects	2.03	0.67	0.49	0.07	1	5
Negative affects	3.25	0.81	-0.15	-0.40	1	5
CC worry	3.23	0.84	-0.29	-0.26	1	5
Problem-centered coping CC	4.69	1.55	-0.47	-0.58	1	7
Meaning-centered coping CC	3.89	1.25	-0.21	-0.53	1	7
De-emphasizing/avoidant coping CC	1.43	0.66	1.61	2.68	1	7

Notes: ^aSocial media such as Instagram, TikTok, Facebook, YouTube, and X. ^bTraditional and digital media such as television, radio, podcasts, newspapers, and magazines (both online and print).

Abbreviations: CC: Climate change; CCI: Climate change information.

primarily elicited negative affect. Figure 2 presents the mean scores for all experiential and affective states assessed in relation to this information, including both positive and negative states.

The *t*-test comparing the mean scores of negative and positive affects confirmed this pattern, indicating that exposure to climate change information tends to evoke negative affect, which in our sample were significantly more intense than positive affect (mean difference = 1.223; $t_{[641]} = 27.872$, $p < 0.001$; Cohen's $d = 1.10$ [95% CI: 1.02, 1.198]).

Correlation analyses indicated that both social media and traditional and digital media were positively and significantly associated with negative affect from climate change information (coefficients of 0.38 and 0.27, respectively; all $p < 0.01$) and worry about climate change (coefficients of 0.38 and 0.23, respectively; all $p < 0.01$). Differences between the correlations, tested using Steiger's *Z*, confirmed that the frequency of exposure to climate change information via social media was significantly more strongly associated than exposure via traditional media with both negative affect from climate change information ($Z = 2.64$, $p < 0.01$) and climate change worry ($Z = 3.67$, $p < 0.001$).

Based on these findings, two multiple linear regression models were developed. Model I, examining the effect of the two sources on negative emotions, was significant ($F_{[2, 639]} = 63.30$, $p < 0.001$; $R^2 = 16.3\%$) and showed that both sources predicted negative affect, with a stronger

influence of social media ($\beta = 0.33$, $p < 0.001$) compared to traditional media ($\beta = 0.15$, $p < 0.01$). Model II, examining worry about climate change, revealed a similar pattern ($F_{[2, 639]} = 59.21$, $p < 0.001$; $R^2 = 15.6\%$), with both sources as significant predictors but a stronger effect of social media ($\beta = 0.35$, $p < 0.001$ vs. $\beta = 0.10$, $p < 0.01$). Overall, these results highlight the predominant role of the frequency of exposure to climate change information on social media in driving both negative affect and climate change worry compared to traditional media.

3.4. Preliminary assumptions and correlational analyses

Before conducting moderation analyses, preliminary checks for multicollinearity among the variables of interest were performed. Tolerance values ranged from 0.41 to 0.88, and variance inflation factor values ranged from 1.12 to 2.45. These results indicated that there were no issues of multicollinearity. Additionally, Durbin-Watson statistics were examined, with values close to 2 suggesting no significant autocorrelation. Pearson correlation analyses were also conducted to preliminarily assess the relationships among variables included in the moderation models; these correlations are reported in Table 2.

As shown in Table 2, gender exhibited a small but significant negative correlation with both the negative affect from climate change information and climate change worry, suggesting that gender differences may influence these constructs. Exposure to climate change information was positively correlated with negative affect from

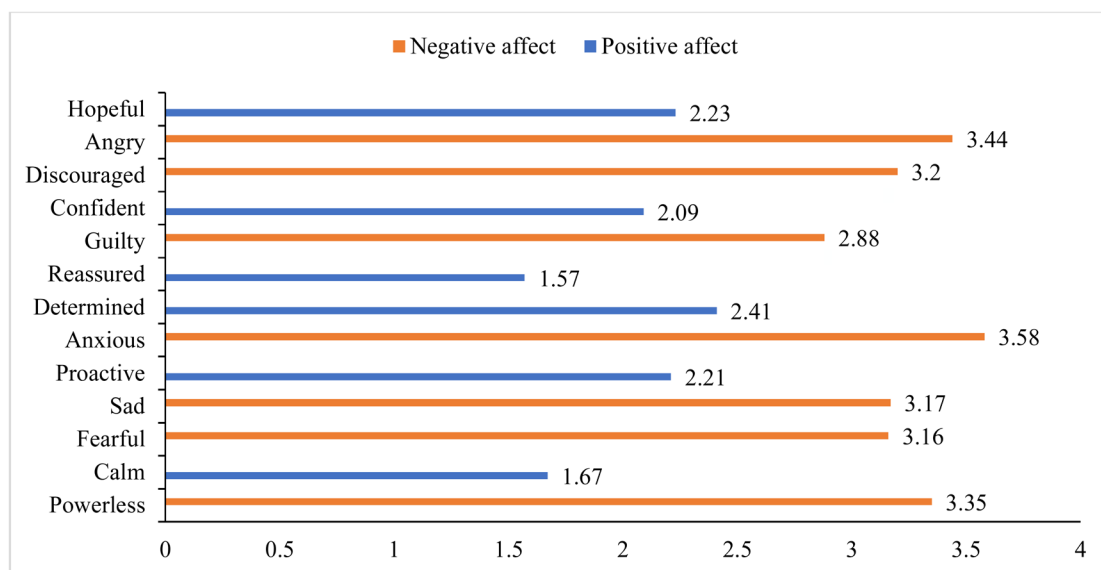


Figure 2. Emotional responses of climate change information

Table 2. Pearson correlations among the variables of interest

	1 (Age)	2 (Gender)	3 (CCIE)	4 (NA_CCI)	5 (CCWS)	6 (PC_COPING)	7 (MC_COPING)	8 (D/A COPING)
1 (Age)	–	–	–	–	–	–	–	–
2 (Gender)	–0.02	–	–	–	–	–	–	–
3 (CCIE)	0.01	–0.00	–	–	–	–	–	–
4 (NA_CCI)	0.06	–0.16**	0.39**	–	–	–	–	–
5 (CCWS)	0.07	–0.17**	0.52**	0.67**	–	–	–	–
6 (PC_COPING)	–0.01	–0.17**	0.33**	0.38**	0.53**	–	–	–
7 (MC_COPING)	–0.07	0.06	0.10*	0.03	0.12**	0.45**	–	–
8 (D/A_COPING)	0.02	–0.01	–0.08	–0.24**	–0.21**	–0.30**	–0.07	–

Notes: * $p < 0.05$ and ** $p < 0.01$ indicate statistical significance. Gender was coded as 0 for female and 1 for male.

Abbreviations: CCIE: Climate change information exposure; CCWS: Climate Change Worry Scale; D/A_COPING: De-emphasizing/avoidant climate change coping; NA_CCI: Negative affects of climate change information; MC_COPING: Meaning-centered climate change coping; PC_COPING: Problem-centered climate change coping.

climate change information and climate change worry. Finally, climate change worry was positively correlated with negative affect from climate change information, problem-centered coping, and meaning-centered coping related to climate change, and negatively correlated with de-emphasizing/avoidant coping strategies.

3.5. The moderating roles of climate change coping strategies on the relationship between CCIE and CCWS (RQ3–RQ5)

Three separate moderation models were tested to examine the moderating role of different coping strategies on the relationship between CCIE and CCWS. All models were significant, indicating that the inclusion of the coping moderator significantly improved the prediction of CCWS. The problem-centered coping model (R3 [Model I]) explained 42% of the adjusted variance in CCWS ($F_{[5, 636]} = 93.60, p < 0.001$), the meaning-centered coping model (R4 [Model II]) explained 29% of the variance ($F_{[5, 636]} = 52.13, p < 0.001$), and the de-emphasizing/avoidant coping model (R5 [Model III]) explained 31% of the variance ($F_{[5, 636]} = 57.76, p < 0.001$).

Significant main effects were observed for CCIE in all models, indicating that greater exposure to climate change information was consistently associated with higher climate change worry. Effects of the coping strategies themselves varied in direction and magnitude: problem-centered coping and meaning-centered coping were positively associated with CCWS, whereas de-emphasizing/avoidant coping was negatively associated. Gender was a significant

covariate in all models, with females reporting higher CCWS, while age was significant only in the problem-centered coping model.

Importantly, all three interactions between CCIE and coping strategies were significant, indicating that the strength of the association between CCIE and climate change worry is contingent upon the type and level of coping strategy employed. Simple slopes analyses revealed that for problem- and meaning-centered coping, the relationship between CCIE and CCWS was strongest at lower levels of coping, whereas for de-emphasizing/avoidant coping, the effect of CCIE was strongest at higher levels of coping.

These findings indicate that the association between CCIE and climate change worry varies as a function of coping strategies. Specifically, significant interaction effects suggest that, for problem-centered and meaning-centered coping, the relationship between exposure and worry is weaker at higher levels of coping, whereas for de-emphasizing/avoidant coping, the relationship between exposure and worry is stronger at higher levels of coping. The complete coefficients for all models and the results of the simple slopes analyses are presented in Table 3, with interaction plots illustrated in Figures 3–5.

4. Discussion

The present study investigated CCIE among a sample of Italian emerging adults, examining the sources they rely on, the emotional responses elicited by such information,

Table 3. Summary of moderation analyses: Effects of CCIE and coping strategies on CCWS

Model	Predictor	β	SE	t	p	Sim. slope	Value (SE)	p
Model I	CCIE	0.38	0.03	11.84	<0.001	–	–	–
	PC_COPING	0.21	0.02	12.12	<0.001	–1 SD	0.48 (0.05)	<0.001
	Age	0.02	0.02	12.12	0.024	Mean	0.38 (0.03)	<0.001
	Gender	–0.15	0.05	–2.71	0.007	+1 SD	0.28 (0.04)	<0.001
	CCIE-PC_COPING	–0.06	0.02	–3.18	0.002	–	–	–
Model II	CCIE	0.49	0.03	14.58	<0.001	–	–	–
	MC_COPING	0.08	0.02	2.34	0.020	–1 SD	0.58 (0.05)	<0.001
	Age	0.02	0.01	1.80	0.073	Mean	0.49 (0.03)	<0.001
	Gender	–0.28	0.06	–4.86	<0.001	+1 SD	0.41 (0.05)	<0.001
	CCIE-MC_COPING	–0.07	0.03	–2.53	0.012	–	–	–
Model III	CCIE	0.47	0.03	14.10	<0.001	–	–	–
	D/A_COPING	–0.22	0.04	–5.18	<0.001	–1 SD	0.38 (0.05)	<0.001
	Age	0.01	0.01	1.54	0.123	Mean	0.47 (0.03)	<0.001
	Gender	–0.27	0.06	–4.78	<0.001	+1 SD	0.55 (0.04)	<0.001
	CCIE-D/A_COPING	0.13	0.04	2.86	0.004	–	–	–

Note: β is the standardized coefficient.

Abbreviations: CCIE: Climate change information exposure; CCWS: Climate Change Worry Scale; D/A_COPING: De-emphasizing/avoidant climate change coping; NA_CCI: Negative affects of climate change information; MC_COPING: Meaning-centered climate change coping; PC_COPING: Problem-centered climate change coping; SE: Standard error; Sim. Slope: Simple slope analysis.

and the protective or risk-related roles of specific climate-change-related coping strategies in the relationship between information exposure and eco-worry. Research on the psychological effects of climate change is an expanding field at the international level that,^{12,71,72} to our knowledge, remains relatively underexplored in the Italian context, particularly when considering the role that media exposure to climate change information may play in eliciting specific emotional responses and cognitive processes.^{8,10,11,73}

Our results indicate that Italian emerging adults rely more on social media (e.g., Instagram, TikTok, Facebook, YouTube, and X) than on traditional media (e.g., television, radio, podcasts, newspapers, and magazines) as sources of information about climate change. This finding is consistent with previous research conducted in the Italian context³⁵ as well as with international studies and large-scale surveys.^{36–38}

Consistent with recent surveys,^{17,18} participants reported perceiving the information obtained from both types of sources as general and superficial. Although some studies suggest that social media may foster awareness, activism, and reduced skepticism regarding climate change,⁷⁴ our correlational and regression analyses indicate that, compared to traditional media, social media use is more strongly associated with—and increases the likelihood of—higher levels of negative affect and climate change worry. These findings are consistent with recent research highlighting the emotionally intense effects, manifested as fear, anxiety, and feelings of helplessness, of the language used on social media platforms, particularly TikTok and YouTube.⁷⁵

As demonstrated by studies conducted in various contexts,^{42,47} our findings indicate a predominance of negative emotions—such as anxiety, helplessness, fear, and

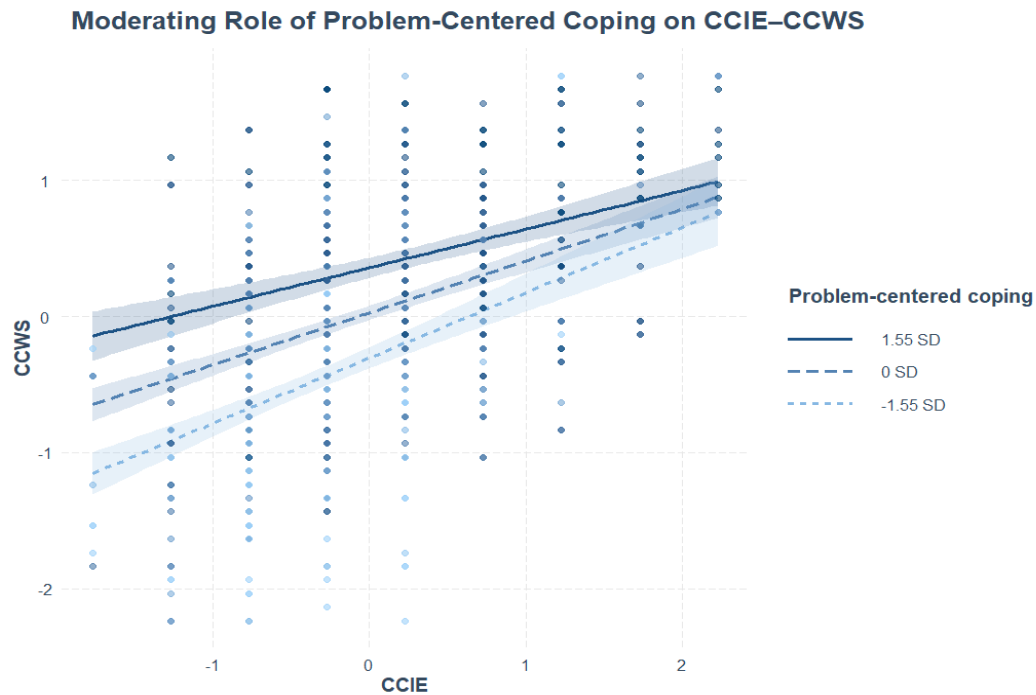


Figure 3. Interaction between CCIE and problem-centered coping in predicting CCWS
Abbreviations: CCIE: Climate change information exposure; CCWS: Climate Change Worry Scale.

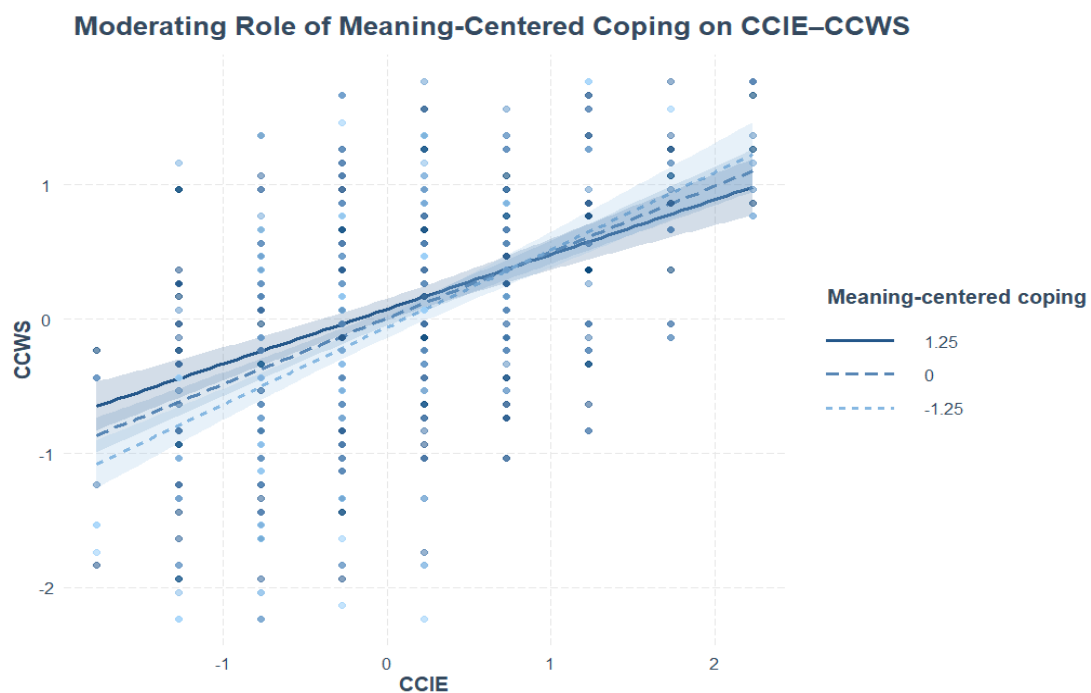


Figure 4. Interaction between CCIE and meaning-centered coping in predicting CCWS
Abbreviations: CCIE: Climate change information exposure; CCWS: Climate Change Worry Scale.

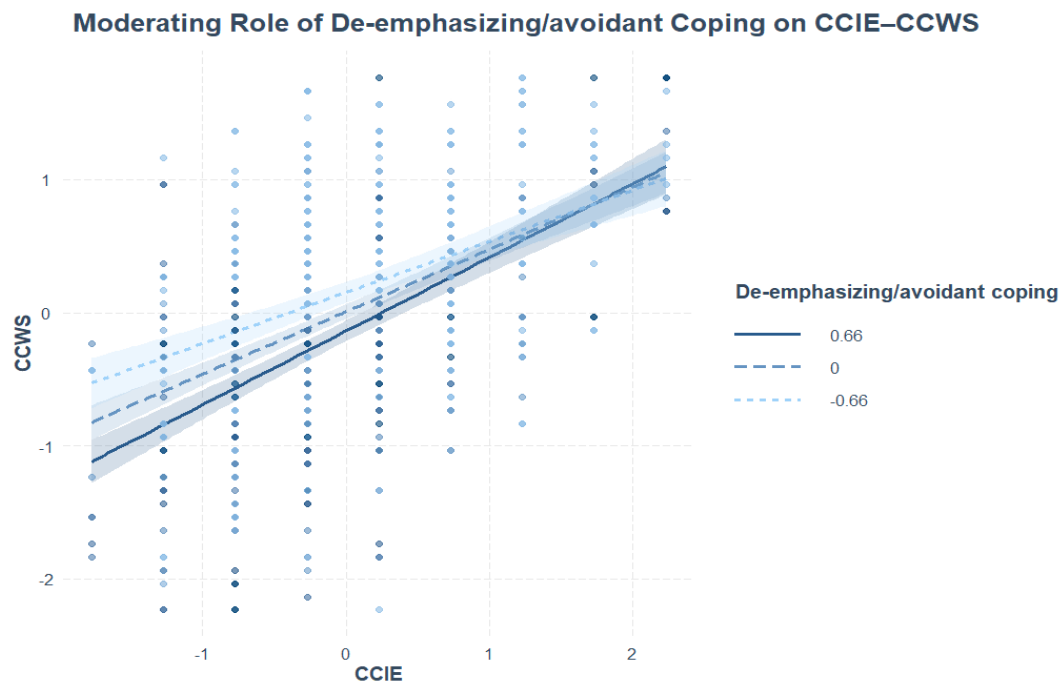


Figure 5. Interaction between CCIE and de-emphasizing/avoidant coping in predicting CCWS
Abbreviations: CCIE: Climate change information exposure; CCWS: Climate Change Worry Scale.

guilt—over positive ones, such as hope or proactivity, in association with media exposure to climate change. In an era in which media communication increasingly adopts alarmist and catastrophic tones,²⁴ the prevalence of negative emotions associated with climate change information may suggest a potentially traumatic dimension of such exposure. This phenomenon, already observed in relation to other social issues,^{27–29} may represent a promising avenue for future research.

Correlational analyses revealed significant gender differences in both negative affect related to climate change and climate change worry. Specifically, gender was negatively associated with negative affect from climate change information and climate change worry, indicating that women reported higher levels of negative affect and climate-related worry compared to men. These results are in line with prior research indicating that women tend to report higher levels of environment-related emotions and negative affect, which may reflect a broader female propensity toward internalization.^{11,76,77}

With regard to coping strategies, climate change worry was positively associated with both problem-focused coping and, to a lesser extent, meaning-focused coping, suggesting that higher levels of worry are linked to greater engagement in both active and meaning-oriented coping

efforts. These findings indicate that, although problem-focused coping is generally considered functional when facing threats perceived as proximal and controllable, in the case of climate change—a global, distal, and difficult-to-manage phenomenon—it may be associated with negative emotions, such as eco-worry and with forms of psychological distress.^{53,54}

The results of the three moderation models suggest that the strength of the relationship between CCIE and climate change worry varies significantly depending on the coping strategy employed. Both problem- and meaning-focused coping emerge as strategies that attenuate the effect of media exposure on climate worry. Problem-focused coping, insofar as it directly addresses the stressor, may serve a preparatory function with respect to climate-related media content, enhancing self-efficacy and reducing feelings of helplessness.⁵¹

Meaning-focused coping also functions as a protective strategy, as the positive reappraisal processes it entails⁵⁶ allow individuals to adopt a broader interpretative framework for the phenomenon.⁵³ On this basis, climate information may not only signal alarm and catastrophe but also serve as a stimulus for redefining personal and collective values, priorities, and goals, thereby guiding individuals' behaviors toward pro-environmental actions.^{20,21} By fostering hope

and confidence in the ability to address climate change, this strategy reduces individuals' emotional vulnerability without denying the seriousness of the problem.^{22,53}

As previously highlighted, the positive relationship between problem- and meaning-focused coping strategies is consistent with the literature, suggesting that these strategies may be associated with higher levels of eco-worry.^{53,54} However, the results of the moderation models indicate that these strategies significantly attenuate the relationship between climate change media exposure and climate change worry, functioning as important protective factors. This apparent discrepancy may be explained by the fact that individuals who employ problem- or meaning-focused coping are better prepared to confront the phenomenon. Consequently, when faced with media content that is often highly anxiety-inducing and catastrophic, they are more protected from the emotional effects elicited by the media, which, if excessive, can become dysfunctional and exacerbate distress.^{11,77,78} For these reasons, we hypothesize that both problem-focused and meaning-focused coping constitute effective tools for worry management, enabling individuals to maintain a level of vigilance conducive to pro-environmental engagement while simultaneously mitigating the risk of climate anxiety or chronic distress.

Finally, our results indicate that the de-emphasizing/avoidant coping strategy is associated with lower levels of climate change worry, consistent with studies highlighting its association with reduced climate-related distress.^{11,53,54} On the other hand, our findings also show that the de-emphasizing/avoidant coping strategy negatively moderates the relationship between CCIE and CCW. In other words, while avoidance appears to reduce worry in general, adopting this strategy increases the impact of media exposure on climate worry. Thus, the results of the moderation analysis suggest that, despite appearances, this coping strategy may not be functional.

Indeed, while de-emphasizing/avoidant coping may be effective when the stressor remains psychologically distant and outside the individual's focus of attention,^{51,54} we hypothesize that media exposure to climate change constitutes an inescapable reality, under which the avoidant coping strategy becomes ineffective. Unlike problem- or meaning-focused coping strategies, increasing exposure to news, images, and videos inevitably reduces psychological distance from the stressor and, consequently, exposes individuals to the very threat that the avoidant coping strategy has prevented them from processing, either cognitively or emotionally. Thus, in the absence of such preparatory engagement with the stressor, the impact of media exposure is likely to be amplified, generating an

increase in worry that could hinder pro-environmental action and negatively affect psychological well-being. According to this hypothesis, the de-emphasizing/avoidant coping strategy may function as a risk factor insofar as, despite its negative association with climate change worry, it promotes the dysfunctional re-emergence of worry when psychological distance from the threat cannot be maintained.

5. Limitations and future directions

To the best of our knowledge, this is the first study to investigate the impact of media exposure to climate-change-related information on eco-worry in the Italian context, while also examining the moderating role of coping strategies in this relationship. However, the present study has several important limitations. These include the presence of potential self-selection bias and the use of a single-method approach, the predominance of university students in the sample, the adoption of a non-probabilistic snowball sampling procedure, and a cross-sectional design that does not allow for causal or directional inferences among variables.

In addition, a further limitation concerns the geographical distribution of the sample, which appears to be largely unbalanced, with most participants recruited from Southern Italy, particularly the Campania region. This geographical concentration may limit the representativeness of the findings, as regional differences in environmental attitudes, media exposure, and socio-cultural factors may have influenced the observed relationships.

To improve the generalizability of the findings, future research should include samples that are more balanced in terms of employment status, area of residence, and educational level. In addition, the lack of a structured theoretical framework and the recent Italian adaptation of the coping scale⁵⁰ may have limited the implementation of more complex analytical models. Future studies could also test more complex models in which the moderating role of the three coping strategies considered is examined simultaneously.

Building on these findings, future studies could employ moderated mediation models or structural equation modeling to explore the relationships among variables in greater depth. Further research should also examine in greater detail the types of media exposure, the content individuals are most frequently exposed to, and their impact on other environmental emotions, such as eco-anxiety and solastalgia. Finally, given that the present study focused on the impact of a collective phenomenon at the micro level—namely, psychological well-being

among young adults—future research could extend the investigation to the macro level by exploring concerns related to the future of the planet, nature, and animals, using specific psychometric instruments that are currently not yet validated in the Italian context.

6. Conclusion

Overall, our findings indicate that media exposure contributes to increased worry about climate change and a higher likelihood of experiencing negative emotions. At the same time, active coping strategies—namely problem- and meaning-focused coping—although positively associated with higher levels of eco-worry, appear to play a crucial role in mitigating the psychological burden associated with the so-called “climate infodemic,” thus functioning as important mechanisms of regulation and adaptation.

From a clinical perspective, these findings highlight the relevance of psychoeducational interventions aimed at promoting adaptive coping strategies and supporting the processing and regulation of emotions related to the climate crisis. In this regard, it is particularly important to support emerging adults in developing a critical and informed evaluation of information sources, given the dual role of media: on the one hand, they represent a fundamental tool for increasing knowledge and awareness of the phenomenon; on the other hand, they may amplify negative mental states and complex environmental emotions, thereby increasing distress and psychological discomfort. While maintaining appropriate adherence to the severity of the threat, information sources should avoid both minimizing the problem and adopting excessively catastrophic or alarmist communication styles, instead fostering understanding and a sense of both individual and collective efficacy.²³

Furthermore, the moderating role of active coping strategies underscores the importance of encouraging engagement in concrete, goal-directed actions at both the individual and collective levels, in order to strengthen the sense of agency and self-efficacy, as well as hope for potential change and trust in governmental institutions. These processes may serve a psychological preparedness function, helping to contain the emotional impact of climate-related information, even when associated with risk scenarios or extreme events.

Finally, the findings highlight the value of promoting narrative frameworks that move beyond exclusively catastrophic representations of the climate crisis. While acknowledging the seriousness of the phenomenon, a communication approach oriented toward concrete, realistic, and contextually meaningful actions—even small-scale ones—may facilitate a more sustainable

engagement with the issue, reducing the risk of emotional overwhelm and disengagement. Such an approach may support a deeper understanding of the crisis while fostering more effective coping strategies and pro-environmental behaviors.

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Conflict of interest

The authors declare they have no competing interests.

Author contributions

Conceptualization: Giorgio Maria Regnoli, Barbara De Rosa

Data curation: Giorgio Maria Regnoli

Formal analysis: All authors

Investigation: All authors

Methodology: Giorgio Maria Regnoli, Barbara De Rosa

Software: Giorgio Maria Regnoli

Project Administration: Giorgio Maria Regnoli, Barbara De Rosa

Supervision: Barbara De Rosa

Validation: Giorgio Maria Regnoli, Gioia Tiano

Visualization: Giorgio Maria Regnoli, Gioia Tiano

Writing—original draft: All authors

Writing—review & editing: All authors

Ethics approval and consent to participate

The study adhered to the ethical guidelines established by the American Psychological Association for the treatment of human research participants and was in line with the principles outlined in the 1995 Declaration of Helsinki and its subsequent amendments, as well as the standards set forth in the Ethical Code of the Psychologist of the Italian National Council of the Order of Psychologists. All research described in the study underwent review and received approval from the Psychological Research Ethics Committee of the Department of Humanities at the University of Naples Federico II (Approval Code: protocol number 1-2023; Approval Date: 13 January 2023; Scientific Project Manager: Giorgio Maria Regnoli). Informed consent was acquired from all individuals participating in the study. The data gathered were analyzed solely in aggregated form, ensuring the anonymity and confidentiality of participants, who were free to withdraw from the study at any point.

Consent for publication

Written informed consent for publication was obtained from all participants. Data were reported in aggregated form without any identifiable information.

Availability of data

The data supporting the findings of this study were derived from a larger research project and are not publicly available (approval code: protocol number 1-2023; approval date: 13 January 2023; scientific project manager: Giorgio Maria Regnoli). However, they may be made available from the corresponding author upon reasonable request.

Further disclosure

The authors confirm that no artificial intelligence tools were used at any stage of the preparation of this manuscript, including study design, data analysis, interpretation of results, drawing of conclusions, or language editing.

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