

The Psychological Impact on Climate Change, Anxiety, And Sad Disorder on Youth

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ABSTRACT

One of the most pervasive threats to contemporary society is climate change, with repercussions that extend well beyond ecological disruption to much broader psychological implications, especially in younger adults. This conceptual project explores the nexus of climate change-related anxiety and Seasonal Affective Disorder (SAD) among college-aged youth, 18-25 years old. Based on contemporary literature available from 2020-2025, this research posits a comprehensive conceptual framework that explores and investigates the central relationships between climate change-related anxiety and psychological well-being, while examining its conditional relations with resilience and mediated by environmental engagement. This conceptual research relies on The Hogg Eco-Anxiety Scale (HEAS) and the Seasonal Affective Disorder Questionnaire-21-item to fill a gap in contemporary research and knowledge on critical intersections and relations among climate-related psychological stress and seasonal patterns of psychological variation among young people. The proposed conceptual research design posits on C-B psychosocial stress models uniting cognitive-behaviourist psychological and theoretical orientations on psychological stress and resilience to explore salient hypotheses on this subject that require systematic testing. This conceptual research offers new implications on climate psychology literature that inform on new implications on mental health interventions and programs to assist young people to deal with psychological stressors that present new challenges to contemporary society.

Keywords: Climate change anxiety, eco-anxiety, Seasonal Affective Disorder, young adults, psychological well-being, college students, environmental distress

INTRODUCTION

The current environmental crisis has presented itself as a defining challenge to this generation of young adults, changing their perceptions of the future and their mental well-being. The group of young adults aged 18 to 25 are at a critical juncture in their development, at which they are developing their identities as young adults and planning their future, at the same time as they are faced with the reality of this impending environmental shift. They are also part of the particularly vulnerable group, as they are well-informed about the impending danger of the climate shift, but are impotent to produce any changes to this reality. Climatic change-related anxiety, popularly known as eco-anxiety, can be described as the state of persistent worry, fear, and distress in relation to environmental degradation and its expected consequences. Unlike more conventional anxiety disorders, eco-anxiety arises out of a rational reaction to real environmental dangers. This makes environmental anxiety a different psychological phenomenon because

it goes beyond the more conventional mental health perspectives in its approach. A recent survey has reported that an overwhelming majority of adolescents across the globe are feeling distressed due to climatic changes. What further clouds the problem is the possible connection between climate-related anxieties and the presence of Seasonal Affective Disorder (SAD), which affects people who regularly experience depressive episodes in line with seasonal changes, usually happening when there is less sunlight. With the impact of climate change affecting seasonal cycles and certain weather changes, knowing how these can affect the intensifying traits associated with SAD becomes more significant. The connection between these two has yet to fully explore established studies, specifically targeting the younger generation who experience these two issues simultaneously.

The purpose of the proposed conceptual paper is to develop a framework that explains how climate change-related anxieties and SAD interact with the psychological well-being of college students. By lending perspectives from different theories and positing a testable model between the variables, it is hoped that the proposed work is useful. The model proposed considers not only the direct consequences but also tests the premise that a college student's resilience could act as a protective factor or that engagement could be a possible mediator between climate-related anxieties and college students' psychological well-being. The relevance of this study transcends the boundaries of academic research. This is owing to the fact that, as a growing trend of demand in college campus-based clinics continues, being aware of the mechanisms involved in environmental impact on college students' mental health is imperative for developing strategies. On a different dimension, this paper is driven by a need for young activists, mental health experts, and environmentalists' increased acknowledgment of the psychological undertones of environmental crises. It is upon this strict conceptual basis that this paper looks forward to informing future scientific studies in developing concrete strategies for young individuals in coping with a generation of environmental crises that pose psychological challenges.

BACKGROUND AND CONTEXT

The Emergence of Climate Change as a Psychological Stressor

The psychological effects of climate change have grown from a peripheral theme during the previous decade towards a central theme among mental health discourses. The Intergovernmental Panel on Climate Change (IPCC) reports have demonstrated and observed that there is an increase in climate changes. Such climate changes influence a tangible outcome that produces a direct effect on psychological factors, especially among populations that show high awareness and worry regarding future changes. The position that young people find themselves in is distinct in this landscape. Because they have come of age with climate change being present and visible to them rather than a potential threat on the other side of their life cycle, they tend to express greater awareness about their environment compared with other generations before them. The introduction they have received to their climate reality through social media platforms and other movements suggests that this is a generation that is intensely aware of their deteriorating planet but that this awareness comes with its personal psychological burden.

The College Student Experience

While College students between the ages of 18 and 25 are found to be a pivotal group to study the phenomenon of climate psychology for many reasons. Firstly, this stage of life entails extensive identity formation and future goal designating, all of which may go awry because of the uncertainty concerning future climatic conditions. Secondly, the same individuals are equipped to comprehend the scientific realities of climate change, which may push them to experience more severe psychological reactions to

the same. Finally, mental health problems are common within this age group irrespective of the stress caused by climatic factors.

The college setting is, of course, a complex entity that offers special considerations of its own. The student is grappling with academic pressures, social change, financial issues, and issues of independence even as they absorb information about global crises related to climate change. This is a complex intersection of individual growth, awareness of the world, and climate change-induced anxiety.

Seasonal Affective Disorder in the Context of Climate Change

Historically, Seasonal Affective Disorder has been conceptualized in terms of its biology and light exposure. But it seems that because of climate change, the predictability of seasons, weather, and the relationship between human life and nature are all being fundamentally changed. In other words, irregular weather conditions, unusual temperature levels, and irregular seasons could impact those who have SAD in entirely new ways. Moreover, the association between awareness of the environment and symptoms of SAD has yet to be explored. It is very likely that people concerned with environmental issues can become even more distressed when they encounter seasonal irregularities which remind them of the state of the environment. On the other hand, symptoms of Seasonal Affective Disorder like feeling tired and lack of motivation may increase feelings of hopelessness with respect to climate change.

The Need for Integrated Understanding

In modern Current literature has primarily studied Climate Anxiety and SAD independent of each other. However, with the rising population of youth who experience Climate Anxiety and SAD together, the lack of understanding between the two conditions poses an important issue regarding the measurement of mental health. Further, the interaction between the two conditions and the other protective factors like Resilience and other mediating factors like Environmental Engagement has been largely unexplored. Such a research environment as described within this paper requires a robust conceptual framework that recognizes just how complicated these linkages are and yet can hypothesize a model through which further research can be conducted. Through a theoretical foundation within recognized psychological theories, as well as a recognition of the distinct nature of climate-related distress, the objective of this paper is to further both theory and practical application.

NEED OF THE STUDY

The research on the interaction between climate change anxiety and Seasonal Affective Disorder is called for by several converging reasons. Recent global surveys obtained from young people show alarming rates of climate-related distress among the youth. Research studies spanning 2020 to 2024 reported that high percentages of their youth worldwide express moderate to severe anxiety about climate change; moreover, large proportions report that such concerns interfere with their daily functioning. Despite this prevalence, mental health services are mostly unprepared to address the psychological distress occurring due to climate-specific anxiety. College counselling centers have reported unprecedented demand for mental health services, with anxiety and depression being the most commonly presented concerns. However, the specific contribution of environmental concerns to this mental health crisis remains poorly quantified and understood. Whereas climate change anxiety and Seasonal Affective Disorder have each received individual research attention, their potential interaction remains virtually unexplored. This represents a critical gap, as both conditions affect significant portions of the young adult population, making their co-occurrence statistically likely. Furthermore, both involve responses to environmental phenomena, suggesting theoretical grounds for interaction. Beyond a focus on problems, there is pressing need to turn

attention to the factors that may protect young adults from climate-related distress or channel their concerns into psychologically healthy outcomes. In this respect, resilience has appeared as a promising protective factor, and environmental engagement represents a potential pathway through which concern about climate might usefully be transformed from paralyzing anxiety into purposeful action. The recent development and validation of specific measurement tools, particularly the Hogg Eco-Anxiety Scale, provides new opportunities for rigorous research when combined with established measures of SAD.

LITERATURE REVIEW

Climate Change Anxiety and Eco-Anxiety

Clayton (2020) laid the foundational work in defining climate anxiety as a chronic fear of environmental doom, against which one is helpless, distinguishing it from clinical anxiety disorders while acknowledging its psychological importance. Hickman et al. (2021) conducted a landmark international survey of 10,000 young people across ten countries. It showed that 59% were very or extremely worried about climate change, while 45% reported that their feelings about climate change affected their daily functioning. This study thus presented the global scope and intensity of climate anxiety among the youth. Ágoston et al. (2022) looked into university students in particular, finding associations between climate anxiety and general anxiety symptoms, depression, and reduced subjective well-being. Based on their findings, it was perceived that climate anxiety does not exist in isolation but interrelates with wider patterns of mental health. Verplanken et al. (2020) tested the cognitive processes underlying climate anxiety, finding rumination and negative automatic thoughts as key mechanisms through which concern about the environment translates to psychological distress. Stanley et al. (2021) investigated the loss associated with environmental degradation, conceptualizing "climate grief" among young adults. The phenomenological study they conducted indicated that even though climate change-related grief shares features with bereavement, it lacks social recognition and support structures. Kurth and Pihkala (2022) considered eco-anxiety in the light of lifespan development, pointing out that the vulnerabilities of young adulthood are more precarious as a result of the reciprocally influential process of formation of identity and environmental uncertainty.

Seasonal Affective Disorder

Nussbaumer-Streit et al. performed a systematic review of light therapy interventions for SAD in 2021, confirming efficacy but with a much-cited emphasis on individual variation in the treatment response. Maruani and Geoffroy looked at the neurobiological mechanisms of SAD, showing disturbance in circadian rhythm, serotonin regulation, and melatonin production as major contributing factors. Roecklein et al. (2021) examined SAD symptoms among college students, reporting higher prevalence than is usually acknowledged, which might result from an interaction of seasonal patterns with academic stress. Møller and Terman (2020) have examined subsyndromal SAD, finding this to be especially common among young adults. The emerging literature is now considering the impact climate change may have on SAD patterns. A recent paper by Larsson et al. (2024) explores in detail how disrupted seasonal patterns and unusual variations in weather make the symptomatology of SAD more complex.

Resilience and Environmental Engagement

Ojala's work focused on the constructs in the light of climate change, and he singled out problem-focused coping, meaning-focused coping, and social support as important components to help adolescents keep psychological well-being while their future environment arouses concern. Zacher and Rudolph studied how future time perspective may moderate the effect of one of its bases-environmental concern-on well-

being and found that people with balanced, realistic views on the future turn out more resilient. Marczak et al. (2023) investigated how environmental activism influences mental health in young adults. They present evidence that collective action offers a sense of agency and meaning that protects against climate anxiety. Klaniecki et al. (2020) looked into coping mechanisms through sustainable behaviours, showing how individual pro-environmental actions offer psychological benefits due to value-behavior congruence. Schwartz et al. (2021) investigated the concept of "constructive hope" in the context of climate action, focusing on how combined future-oriented positive emotions with concrete action planning support both environmental outcomes and psychological well-being.

THEORETICAL GROUNDS

The proposed framework synthesizes several theoretical approaches. The cognitive-behavioural tradition, and especially Beck's cognitive theory and the transactional model of stress and coping by Lazarus and Folkman, provides basic insights into the way in which environmental perceptions are translated into emotional and behavioural responses. Principles of environmental psychology, such as Attention Restoration Theory and place attachment theory, provide insight into how climate change threatens restorative natural environments and emotional bonds with meaningful locations. Where Erikson's psychosocial development theory defines young adulthood as a stage focused on identity, emerging adulthood theory describes ages 18-25 as a time of exploration and possibility. Processes that are muddled by ambiguity in the climate. The biological underpinning of SAD is rooted in circadian rhythm theories and disturbed neurotransmitter production in response to seasonal light variations.

Bandura's social cognitive theory, especially, through the concept of self-efficacy and, on a broader scale, collective efficacy, presents an explanation as to how perceptions of capacity to address climate change influence psychological responses. Hobfoll's Conservation of Resources theory predicts that climate change threatens multiple resource categories simultaneously, creating potential loss spirals in which initial losses lead to vulnerability for further loss.

CONCEPTUAL FRAMEWORK AND THEORETICAL ARGUMENTS

Core Constructs

Climate Change Anxiety (Independent Variable) Psychological distress exclusively due to awareness of environmental degradation measured through the Hogg Eco-Anxiety Scale. Seasonal Affective Disorder (Independent Variable) Recurrent depressive episodes following a seasonal pattern, measured using the SAD 21-item questionnaire. Psychological Well-being(as dependent variable) multidimensional mental health concerning emotional, psychological, and social functioning. Resilience (Moderator Variable)The personal competence that enables one to sustain or return to a psychological well state during and after an adverse event includes emotional regulation, problem-solving abilities, and social support. Environmental Engagement (Mediator Variable) Cognitive, behavioural, social, and emotional pre-occupation with environmental issues.

Theoretical arguments

Why Climate Anxiety Affects Well-being: Climate change represents a chronic, inescapable stressor that is ongoing without clear resolution. According to chronic stress theory, sustained exposure to uncontrollable threats should deplete psychological resources. In addition, climate change requires confrontation with existential concerns, including mortality and meaning that elicit anxiety testing the adequacy of conventional psychological defences. Climate change entails various forms of loss-actual,

anticipated, and symbolic-that are often socially unacknowledged, rendering psychological processing more difficult.

Why SAD Affects Well-being: SAD entailed an impairment of neurotransmitter systems integral to mood regulation, directly impacting emotional functioning through biological processes. Additionally, the symptoms of SAD create behavioural curtailment models-reduced social interaction, reduced activity, withdrawal from activities a person finds enjoyable-that eliminate protective factors and build self-reinforcing cycles of low mood.

Why Climate Anxiety and SAD Might Interact: The Conservation of Resources theory suggests that multiple simultaneous stressors create depletion spirals where one stressor reduces resources for coping with others. SAD depletes energy and positive affect needed for managing climate anxiety, while the latter consumes cognitive resources needed for managing seasonal mood changes. Furthermore, negative mood associated with SAD may amplify threatening interpretations of climate information. On the other hand, climate anxiety may increasingly render one sensitive to seasonal changes as reminders of environmental instability.

Why Resilience Should Moderate: According to the stress-buffering hypothesis, protective resources exert primary effects under conditions of stress. Resilience provides emotional regulation-reduced intensity of negative responses, adaptive coping strategies that maintain functioning despite stressors, and cognitive flexibility allowing individuals to hold complex views, acknowledging threats while maintaining hope.

Why environmental engagement should mediate: Environmental anxiety and climate anxiety often are characterized by a sense of powerlessness. In environmental engagement, various opportunities to exert agency may reinstate a sense of personal efficacy. Engagement also offers meaning-making opportunities in that activism and sustainable behaviours may be purposeful and connected to something beyond the self. Finally, environmental engagement often is a social enterprise amidst supportive relationships that buffer stress.

PROPOSED CONCEPTUAL MODEL

The proposed relationships are as follows:

Direct Effects

The direct effects of the environmental stressors on psychological outcomes have been proposed by the study based on the following hypotheses: H1: Climate change anxiety is negatively predictive of psychological well-being-such that greater climate anxiety is related to lesser well-being. H2: Symptoms of Seasonal Affective Disorder will negatively predict psychological well-being, so that greater SAD symptomatology is related to reduced well-being. H3: An interactive effect, such that climate anxiety and SAD interact in predicting well-being, with their combined effects exceeding the simple additive combination of their individual effects.

Moderation Effects:

Resilience is expected to act as a protective moderator variable that buffers negative environmental stressor effects. H4 posits that resilience moderates the influence of climate anxiety on well-being, with the negative impact of climate anxiety on well-being being attenuated among those at higher levels of resilience. Likewise, H5 suggests that resilience will moderate the effect of SAD symptoms on psychological well-being, where the negative effect of SAD on well-being outcomes will become weaker for high resilience.

Mediation Effects:

Environmental engagement is positioned as the mechanism that explains how climate anxiety influences well-being. H6a: Climate anxiety positively predicts environmental engagement, meaning that concern about climate change serves to motivate increased environmental involvement. H6b: Environmental engagement positively predicts psychological well-being, showing that active environmental participation supports mental health. H6c: We propose the indirect mediation effect, hypothesizing that environmental engagement mediates the relationship between climate anxiety and psychological well-being in such a way that climate anxiety influences well-being at least partially through its impact on environmental engagement behaviours. (Independent variable)

Proposed model

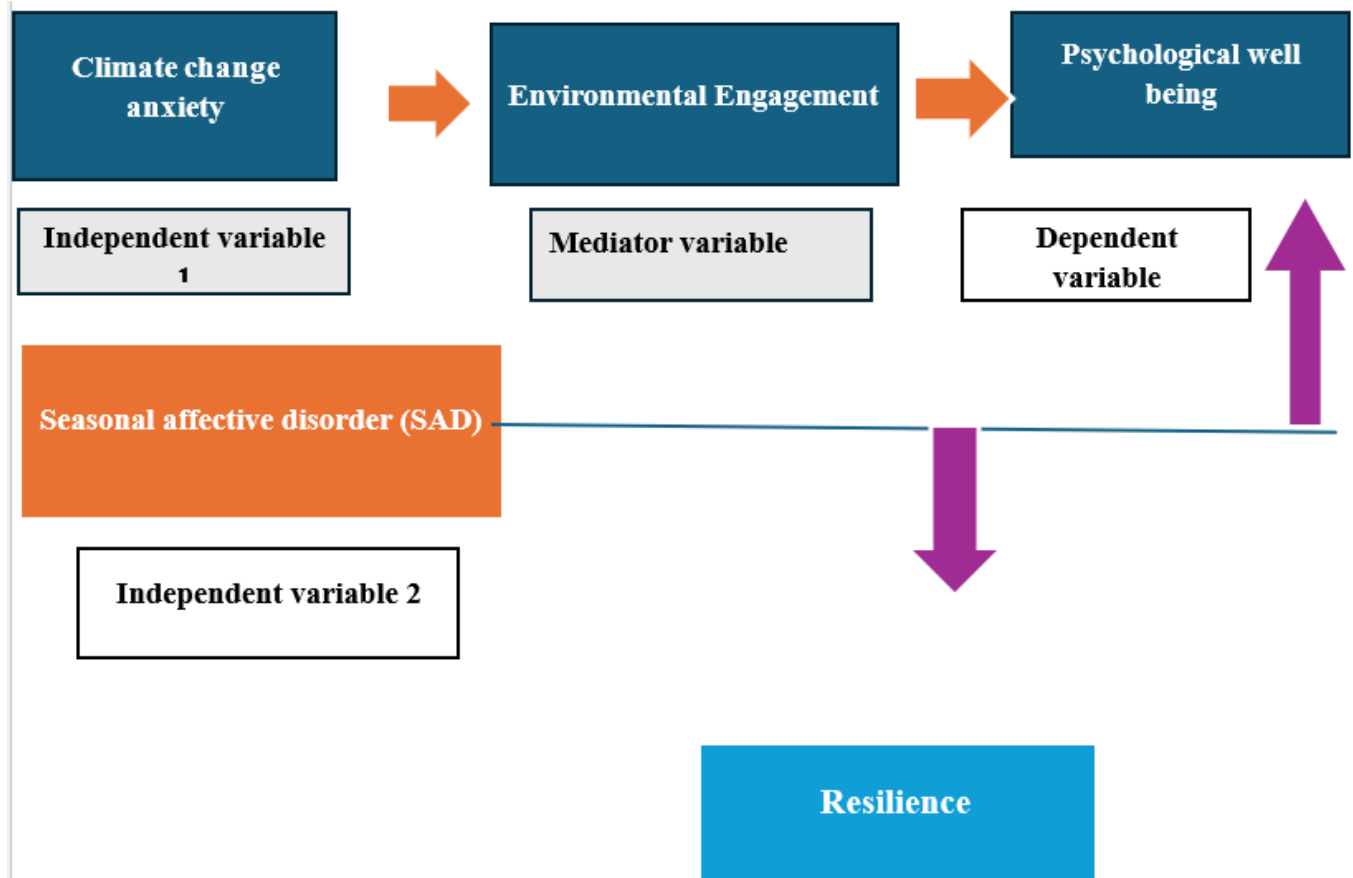


Fig: proposed model of mediator and moderator effect

RESEARCH OBJECTIVES AND QUESTIONS

Objectives

- RO1: Investigating Direct Correlations Between Anxiety for Climate Change and Psychological Well-being in College-Aged Young Adults, 18-25 Years Old
- RO2: Explore direct linkages between symptoms of SAD and psychological well-being
- RO3: Investigate if climate anxiety and SAD interact to forecast well-being
- RO4-5: Evaluate if resilience impacts the links among environmental stressors and well-being
- RO6: Assess whether environmental engagement is mediating the relationship of climate anxiety with well-being
- RO7: Conceptual Model Creation - Identifying the Interrelationship Between All Constructs

Research Questions

RQ1: What is the type and extent of associations between climate-related anxiety and well-being?

RQ2: To what extent are symptoms of SAD correlated to the psychological health of university students?

RQ3: Is climate anxiety and SAD interaction predictive of well-being?

RQ4-5: Does resilience mitigate the negative effects of climate anxiety and SAD?

RQ6: Does eco-engagement mediate the relationship of climate anxiety to well-being

RESEARCH METHODOLOGY

Research Design

This conceptual piece suggests a cross-sectional design, which involves testing for relationships between variables at a point in time. A cross-sectional design can easily consider how several variables interact at once because it gives a point of reference to lead longer-term studies.

Population and Sampling

The target population for this study consists of college students aged 18-25 currently enrolled in undergraduate or graduate programs. A purposive sampling approach will be employed, with 4s institutions selected to represent diverse geographic regions, institution types, and student demographics. Within each institution, random sampling will be conducted with stratification based on academic year, academic discipline, and gender identity to ensure balanced representation. The target sample size is $n=200$ based on power analysis for multiple regression, moderation, and mediation analyses. This sample size provides adequate statistical power for detecting medium effect sizes in the proposed analyses. To account for incomplete responses, recruitment will target approximately 220-250 participants to ensure at least 200 complete and usable responses. Inclusion criteria include age 18-25, current college enrolment, English proficiency, and informed consent. Exclusion criteria include severe psychological crisis requiring immediate intervention, inability to provide informed consent, and non-enrollment in college.

Measurement Instruments

Climate change anxiety will be assessed using the Hogg Eco-Anxiety Scale (HEAS), which measures affective symptoms, rumination, behavioural symptoms, and functional impairment related to climate change. Seasonal Affective Disorder will be evaluated through the 21-item SAD Questionnaire assessing mood changes, energy levels, sleep patterns, and appetite variations across seasons. Psychological well-being will be measured using either the Mental Health Continuum-Short Form (MHC-SF) or Warwick-Edinburgh Mental Well-Being Scale (WEMWBS), potentially supplemented with the Depression Anxiety Stress Scales (DASS-21) for comprehensive assessment. Resilience will be assessed using either the Brief Resilience Scale or Connor-Davidson Resilience Scale to evaluate participants' capacity to bounce back from stress. Environmental engagement will be measured through a combined approach incorporating the Pro-Environmental Behaviour Scale, environmental activism items, Environmental Identity Scale, and Nature Connectedness Scale to capture multiple dimensions of environmental involvement including cognitive, behavioural, social, and emotional engagement.

Data Collection Procedures

Administration via s offline means (visit to institution department and collect data), completion duration of 30-40 minutes. Recruitment via collaboration between institutions: Comprehensive consent procedure with resources available for mental health topics.

Data Analysis Plan

Preliminary Analyses: Screen data for missing values, outliers, and normality; calculate descriptive statist-

ics; evaluate the psychometrics of all scales.

Primary Analyses:

Apply multiple regression for direct effects (H1, H2) and Use hierarchical regression with an interaction term for moderation (H3, H4, H5) .Conduct mediation analysis with the PROCESS macro or structural equation modelling for indirect effects (H6) and Evaluate model fit and interpret effect sizes

Ethical Considerations

Obtain IRB approval from all participating institutions. Provide clear informed consent that highlights voluntary participation and the right to withdraw. Ensure responses are anonymous and confidential with secure data storage. Offer mental health resources due to potentially distressing content. Follow all relevant ethical guidelines for research involving human subjects.

RESEARCH GAPS

This conceptual approach fills a number of important research gaps in existing literature. Firstly, the relationship between climate-related anxiety and SAD has been overlooked in the literature, which is surprising because together they impact substantial numbers of young adults, making it an fundamental gap in terms of understanding the interrelationship between such environmental stress. Secondly, while there has been literature examining resilience in the environmental literature, specifically its role in moderating the impact of climate-related anxiety has been overlooked in terms of using integrated research designs examining interactions between variables. Thirdly, while environmental engagement has been examined using integrated research designs looking at its role in terms of coping processes for environmental stress, its potential role in mediating processes explaining interrelationships between variables examining environmental stress in terms of its impact of environmental-related anxiety has been overlooked. Finally, because environmental stress can impact upon a number of significant variables in terms of college students aged between 18-25 years, it has been overlooked in terms of examining comprehensive designs using instruments such as the Hogg Scale of Environmentally Related Anxiety.

CONSEQUENCES

The theoretical implications are that this provides a framework that takes theory one step further by knitting together the previously separate research streams of climate psychology and seasonal mood disorders, conveys specific mechanisms through which environmental factors affect mental health, distinguishes between moderating protective factors and mediating adaptive pathways, and offers testable propositions that can be refined through empirical investigation.

Practical Applications: This research would have implications for developing campus mental health services, such as screening protocols that include climate anxiety assessment, counselling training around environmental distress as a legitimate mental health concern, support groups for climate-related distress, and integrating climate psychology into current programming. Educational institutions should integrate resilience-building into curricula and student development programs; facilitate opportunities for environmental engagement that offer agency and community; create spaces to process climate emotions; and balance environmental education with psychological support. Policy development should recognize youth climate anxiety as a public mental health issue in need of resources; support funding for research that examines psychological dimensions of climate change; develop evidence-based guidelines on addressing climate distress; and integrate mental health considerations into climate communication and education policies.

Theoretical Distinctions and Implications: The framework suggests several intervention targets, including the development of emotional regulation, adaptive coping, social support networks, and realistic optimism regarding environmental futures through resilience enhancement programs. Engagement facilitation should create opportunities for meaningful environmental action, such as offering agency restoration, community connection, or behaviour in line with values. Integrated approaches should address climate anxiety and SAD simultaneously when a student is experiencing both conditions, considering their possible interaction and shared origins in environmental concern.

CONCLUSIONS

This study provides an interdisciplinary conceptual framework in analysing how environmental stressors, more specifically climate-related psychological distress and seasonal shifts in mood, interact in predicting mental health outcomes for the 18-25-year-old age demographic. The conceptual framework suggests direct associations between these particular environmental issues and well-being, while suggesting resilience as the offset against these issues and potentially utilizing role engagement in the environment as a means of mediation. This conceptual framework provides an important contribution in rectifying current study limitations by proactively seeking interaction effects rather than point associations. Today, there is an exponentially increasing number of environment-related psychological distress incidents in youth demographically speaking, meaning these interaction effects make for an important area in urgent relevance for conceptual framework advances in practical applications for intervention implementation. Furthermore, the conceptual framework developed for this study provides foundations in theory toward defined environment-and-mental health associations, meaning it also provides important contributions toward current scholarship for implementing knowledge regarding psychological responses for specified changes in these two distinct environment and health dimensions.

REFERENCES

1. Ágoston, C., Csaba, B., Nagy, B., Kőváry, Z., Dúll, A., Rácz, J., & Demetrovics, Z. (2022). Identifying types of eco-anxiety, eco-guilt, eco-grief, and eco-coping in a climate-sensitive population: A latent profile analysis. *Current Psychology*, 41, 4085-4099.
2. Clayton, S. (2020). Climate anxiety: Psychological responses to climate change. *Journal of Anxiety Disorders*, 74, 102263.
3. Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E. E., ... & van Susteren, L. (2021). Climate anxiety in children and young people and their beliefs about government responses to climate change: A global survey. *The Lancet Planetary Health*, 5(12), e863-e873.
4. Klanićki, K., Leventon, J., & Abson, D. J. (2020). Human–environment relationships in place-based community initiatives. *Regional Environmental Change*, 20, 1-14.
5. Kurth, C., & Pihkala, P. (2022). Eco-anxiety: What it is and why it matters. *Frontiers in Psychology*, 13, 981814.
6. Larsson, S., Olsson, L., & Johansson, M. (2024). Climate change and seasonal affective disorder: Exploring new patterns in mood disturbances. *Environmental Psychology Review*, 8(2), 145-162.
7. Marczak, M., Wierzba, M., Zaremba, D., Kulesza, M., Szczypiński, J., Kossowski, B., & Marchewka, A. (2023). Beyond climate anxiety: Development and validation of the inventory of climate emotions (ICE). *Global Environmental Change*, 83, 102764.

8. Maruani, J., & Geoffroy, P. A. (2022). Bright light as a personalized precision treatment of mood disorders. *Frontiers in Psychiatry*, 13, 943506.
9. Møller, H. J., & Terman, M. (2020). Seasonal affective disorder and its prevention by anticipatory treatment with bupropion XL. *Biological Psychiatry*, 74(8), 553-554.
10. Nussbaumer-Streit, B., Forneris, C. A., Morgan, L. C., Van Noord, M. G., Gaynes, B. N., Greenblatt, A., ... & Gartlehner, G. (2021). Light therapy for preventing seasonal affective disorder. *Cochrane Database of Systematic Reviews*, 3, CD011269.
11. Ojala, M. (2021). Safe spaces or eco-bubbles? Young people's mental health and the experience of teaching about climate change. *Environmental Education Research*, 27(3), 321-337.
12. Pihkala, P. (2020). Anxiety and the ecological crisis: An analysis of eco-anxiety and climate anxiety. *Sustainability*, 12(19), 7836.
13. Roecklein, K. A., Schumacher, J. A., Miller, M. A., & Ernecoff, N. C. (2021). Cognitive and behavioral predictors of light therapy use in seasonal affective disorder. *Journal of Behavioral Medicine*, 44, 198-208.
14. Schwartz, S. E., Benoit, L., Clayton, S., Parkinson, D., Swenson, C., & Lowe, S. R. (2021). Climate change anxiety and mental health: Environmental activism as buffer. *Current Psychology*, 42, 16708-16721.
15. Stanley, S. K., Hogg, T. L., Leviston, Z., & Walker, I. (2021). From anger to action: Differential impacts of eco-anxiety, eco-depression, and eco-anger on climate action and wellbeing. *The Journal of Climate Change and Health*, 1, 100003.
16. Verplanken, B., Marks, E., & Dobromir, A. I. (2020). On the nature of eco-anxiety: How constructive or unconstructive is habitual worry about global warming? *Journal of Environmental Psychology*, 72, 101528.
17. Zacher, H., & Rudolph, C. W. (2021). Individual differences and changes in subjective wellbeing during the early stages of the COVID-19 pandemic. *American Psychologist*, 76(1), 50-62.