

The therapeutic effects of eco-artmaking on (emerging) environmental professionals

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ABSTRACT

This study explores the therapeutic potential of eco-artmaking for (emerging) environmental professionals ((E)EPs) as an emotion-focused coping strategy. Varied emotional responses to environmental changes, termed "eco-emotions," are causing psychological distress among (E)EPs. Despite existing coping strategies, a gap remains in addressing (E)EPs' specific needs. The research involved focus groups with EPs and EEPs, who participated in a two-hour eco-artmaking session and a follow-up interview a week later. Participants reported temporary positive emotions post-session, but these effects were short-lived. While eco-artmaking provided immediate relief and a community feeling, it did not alter deeper, persistent negative eco-emotions, suggesting a need for regular sessions for lasting benefits. Further longitudinal studies are needed to explore sustained impacts of eco-art therapy and its integration into support systems for (E)EPs.

Keywords: ecopsychology, well-being, environmental scholars, environmental students, eco-art

1. Introduction and problem statement

"Look at this graph and try not to cry," a professor joked during my first week of the master Environment and Resource Management at the Vrije Universiteit Amsterdam. He presented a graph that depicted the dramatic rise in atmospheric carbon dioxide over the past 250 years. The room filled with nervous laughter, though for me, the graph sent shivers down my spine. This moment, though in 2023, is still relevant today as it unveiled an unspoken truth. It revealed the emotional burden of those in the environmental field and their inability to deal with these feelings effectively.

1.1 Problem statement

Environmental change is complex, as its effects are distributed across vast areas over extended periods (Liu et al., 2013). This interconnectedness has led some to classify environmental change as a "super wicked problem" (Levin et al., 2012) and a "hyperobject" (Morton, 2013). While these concepts help us understand the Anthropocene, its complexity may surpass our mental capacities (Renouf, 2021). As a result, our inability to "make sense of the senseless" has been speculated to lead to psychological distress (Clayton et al., 2013; Manning & Clayton, 2018).

The impact of environmental change on the emotional well-being of those on the front lines is a new field of study. Here, "those on the front lines" refers to (emerging) environmental professionals or (E)EPs. This includes anyone engaged in the environmental sciences, both professionals and students. This group is interesting because

their daily work is to collect evidence and provide solutions for environmental challenges, exposing them to these problems more frequently than the general population (Head & Harada, 2017). Moreover, there is a discrepancy between the urgent warnings issued by (E)EPs and the tepid reactions from businesses and governments (Wright & Nyberg, 2012). This mismatch appears to adversely affect the emotional well-being of (E)EPs in their professional roles and academic studies (Gilford et al., 2019; Haddaway & Duggan, 2023; Manning & Clayton, 2018). Additionally, (E)EPs might feel particularly susceptible to the impacts of environmental change due to their continuous professional and academic focus on the subject (Renouf, 2021).

The literature underscores the need for further investigation of the emotional impact of their professional and academic pursuits on EPs (Haddaway & Duggan, 2023; Head & Harada, 2017) and EEPs (Daeninck et al., 2023). Additionally, Head and Harada (2017) emphasise the importance of exploring emotion-focused coping tools for (E)EPs, which are "aimed at managing negative feelings related to a stressor with the goal of reducing the impact of those feelings" (Blum et al., 2012, p. 596). On a personal note, it would be beneficial to identify new strategies to better support EEPs in navigating the emotional challenges associated with our studies.

1.2 Eco-artmaking

One example of an emotion-focused coping tool is eco-artmaking, an approach in which participants express their emotions through creative arts. This may involve a broad

spectrum of expressive forms, including visual arts, drama, music, dance, movement, and writing, and may use direct interactions with animals, plants, and wilderness experiences (Kopytin, 2021). Participants engage in a type of artmaking where nature is involved either through form or theme. Afterwards, participants reflect on both their creations and the creative process (Pike, 2021). It may be experienced in indoor or outdoor locations, individually or in a group, with sessions spanning several hours to multiple weeks (Speert, 2016). Eco-artmaking is speculated to work therapeutically, meaning it has a "beneficial effect on the body or the mind" (Merriam-Webster, n.d.). Because of this, it is often referred to as eco-art therapy. (Pike, 2021) shows that, through eco-art therapy, participants' awareness of themselves and the world around them is speculated to increase. This would allow them to cope more effectively with negative eco-emotions.

1.3 Research objective

It should be noted that Pike's findings apply to the general population and not specifically to (E)EPs. An extensive research gap remains on the impact of eco-artmaking on (E)EPs. Studies detail interventions like "safe spaces" for EPs (Haddaway & Duggan, 2023), and master theses on the effectiveness of eco-art therapy for specific groups exist (Figueroa, 2023; Johnson, 2021; Saraceno, 2017). This study is the first to examine the therapeutic effects of an eco-artmaking session for (E)EPs. Specifically, this study investigates whether such a session is beneficial for (E)EPs to manage their eco-emotions. The main research question of this study is: What are the therapeutic effects of eco-artmaking on (emerging) environmental professionals?

Sub-questions are:

1. How does their work or study affect (emerging) environmental professionals' emotional well-being?
2. What is the reported emotional well-being of (emerging) environmental professionals directly after an eco-artmaking session?
3. Which therapeutic effects do (emerging) environmental professionals report one week after participating in an eco-artmaking session?

1.4 Positionality statement

As a white cisgender male artist and EEP from the Netherlands, my perspective on the therapeutic benefits of (eco-)artmaking is influenced by my position and biases. I believe supporting EEPs in managing emotional challenges is crucial. Furthermore, I align with O'Mahony's (2022) concept of "sustainable wellbeing," which integrates sustainability and wellbeing for a win-win approach. Gil-

ford et al. (2019) and Head and Harada (2017) also argue that the Earth science community must prioritise mental well-being to tackle environmental challenges effectively.

This study uses the term "eco-artmaking session" instead of "eco-art therapy". Since no official definition exists for eco-art therapy, and the term "therapist" is unregulated in the Netherlands (Psynd, n.d.), the latter was deemed to imply professional guidance. Additionally, studies on eco-art therapy typically involve multiple follow-up sessions, while the focus group of this study had only one session with no psychotherapist facilitator. Therefore, "eco-artmaking session" refers to the intervention in this study, while "eco-art therapy" refers to existing literature.

2. Literature review

2.1 Theoretical framework

The following sections explore eco-emotions and ways to measure these, coping mechanisms, eco-emotions in (E)EPs, eco-artmaking, and its known therapeutic effects.

2.1.1 Eco-emotions and coping strategies

Environmental crises strongly influence the emotional well-being of individuals (Hayes et al., 2018; Lawrance et al., 2022; Ogunbode et al., 2022), with varied reactions depending on personal and contextual factors. Responses are shaped by the perceived nature of environmental change, its direct impacts, geographic location, and an individual's psychological and socio-economic surroundings (Higginbotham et al., 2007; Hrabok et al., 2020; Marselle et al., 2021). A survey involving 10,000 children and youths across ten countries (Australia, Brazil, Finland, France, India, Nigeria, Philippines, Portugal, the UK, and the USA) found that 59% are "very or extremely worried" about climate issues, with 45% stating that these concerns adversely affected their daily functioning (Hickman et al., 2021). In the Netherlands, 20% of young people report experiencing climate-induced stress, and a broader survey spanning 50 countries indicates that 80% of participants of all ages are concerned about environmental change (Narawad, 2023).

The spectrum of emotional responses to environmental change is vast, with various terms used to describe these feelings. "Ecological grief" is used to describe feelings due to experienced or anticipated ecological losses (Cunsolo & Ellis, 2018), while "solastalgia" captures distress from environmental changes impacting one's sense of place and identity (Albrecht et al., 2007). "Eco-anxiety" describes dread from negative environmental news (Clayton, 2020), and other terms include "eco-guilt" (violating personal environmental standards (Moore & Yang, 2020)), "eco-paralysis"

(a feeling of helplessness (Albrecht et al., 2007)), and "ecorexia" (obsessive sustainability efforts (Virgolino et al., 2020)). These "secondary emotions" (Haddaway & Duggan, 2023) fall under "eco-emotions" (Braniecka et al., 2014) and are existential rather than biomedical, reflecting the rational, ongoing threat of environmental change (Albrecht, 2011). Eco-emotions, however, are not inherently negative. They can also include positive feelings such as hope, optimism, and pride (Pihkala, 2022). Importantly, experiencing eco-emotions is a natural and legitimate response, not a mental health disorder, as these emotions are not caused by personal wrongdoing (Bhullar et al., 2022). While often associated with climate change, eco-emotions can stem from other planetary boundary concerns, such as freshwater depletion, biosphere integrity, and ocean acidification (Voški et al., 2023).

2.1.2 Measuring eco-emotions

Eco-emotions are studied through quantitative, qualitative, and mixed methods (Coffey et al., 2021). Quantitative questionnaires, while reliable and replicable, face limitations such as social desirability bias (Delroy & Simine, 2007), recall bias (Schwarz, 1999), response biases like acquiescence and extremity bias (Krosnick, 1991), and interpretation bias due to differing participant perspectives (Van De Vijver & Tanzer, 2004). Qualitative methods, including interviews and focus groups, provide richer insights into personal and collective emotional responses to environmental change (Clayton et al., 2017; Norgaard, 2006). However, these methods are resource-intensive and prone to issues like small sample sizes (Rubin & Rubin, 2012), dominant personalities, and group dynamics that may suppress dissenting views (Morgan, 1997). No standard questions are used across qualitative or mixed-method studies. However, tools like Plutchik's Wheel of Emotions (Fig. 1) may help participants articulate their feelings with emotional granularity, potentially enhancing emotional well-being (Barrett et al., 2001; Warpechowski et al., 2019). This tool highlights emotion oppositions and intensities, aiding accurate expression (Plutchik, 1984).

2.1.3 Coping with eco-emotions

Responses to eco-emotions vary, from cognitive reframing to denial (Clayton, 2020). Coping strategies include problem-focused approaches, like seeking solutions or setting boundaries, and emotion-focused methods, such as hobbies, mindfulness, or exercise (Morin, 2023). Both have limitations: problem-focused strategies may fail without actionable solutions, while emotion-focused methods may not address root issues (Clayton, 2020). Defensive coping,

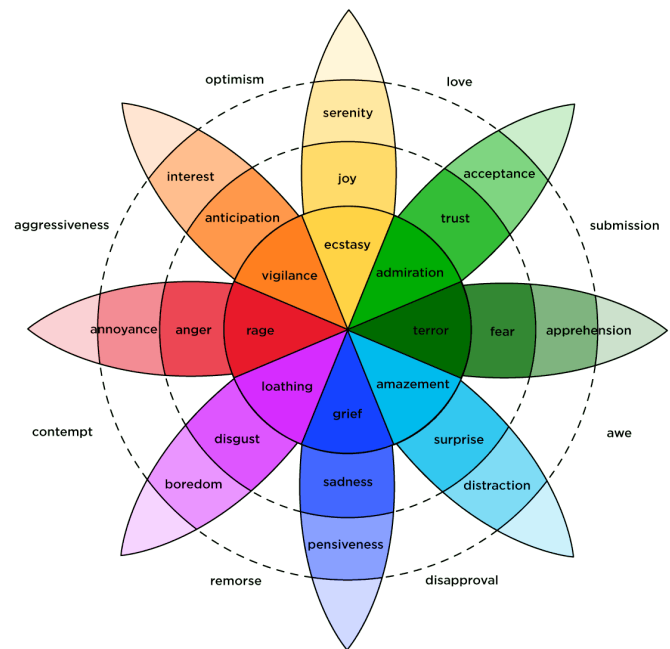


Figure 1: Plutchik's Wheel of Emotions (Whatley, 2013).

such as ambivalence, can hinder long-term environmental engagement and may worsen mental health over time (Potash et al., 2017; Wobeto et al., 2022).

Therapeutic approaches to eco-emotions include psychoeducation to normalise experiences (Ojala, 2016), mindfulness and meditation (Bourban, 2023), Cognitive Behavioral Therapy (Lindhe et al., 2023), ecotherapy (Summers & Vivian, 2018), support groups (Baudon & Jachens, 2021), activism (Jain & Jain, 2022), psychodynamic psychotherapy (Pienaar, 2011), community resilience-building (Brueckner & Ross, 2019), and art therapy (Pihkala, 2018). Eco-art therapy combines mindfulness, ecotherapy, support groups, psychotherapy, and art therapy, showing promise despite limited research (DiPietro, 2016). No single treatment fits all, and combining approaches may offer the best outcomes (Baudon & Jachens, 2021).

2.1.4 Eco-emotions and coping in environmental professionals

The terms "environmental professionals" and "emerging environmental professionals" are drawn from Daeninck et al. (2023). EPs include engineers, scientists, planners, lawyers, and others, reflecting the field's diversity (Network for Environmental Professionals, n.d.). The prefix "emerging" is used to include students aiming to enter this field. (E)EPs are uniquely vulnerable to negative eco-emotions, such as frustration, sadness, and anger, due to their frequent exposure to environmental evidence and its consequences (Clayton, 2018; Duggan et al., 2021; Head &

Harada, 2017). This heightened awareness increases risks of burnout, anxiety, and compassion fatigue (Duggan et al., 2021; Pihkala, 2020).

EPs often struggle with a lack of support systems, the stigma surrounding mental health, and societal pressure to focus on positivity (Gilford et al., 2019; Head & Harada, 2017). Communication challenges, including policymakers ignoring or misusing EPs' information, exacerbate feelings of helplessness and despair (Gilford et al., 2019). Additionally, the scientific norm of emotional restraint can suppress emotional expression, worsening mental health outcomes (Brysse et al., 2013). Coping strategies among EPs include emotional detachment, focusing on scientific rationality, and distancing from climate impacts, though these approaches have limitations (Coulter, 2018; Hoggett & Randall, 2018). A strong sense of community can mitigate these challenges, offering vital social support (Clayton, 2018; Richardson, 2018). Studies recommend tailored coping mechanisms and normalising emotional expression to foster a resilient research community (Duggan et al., 2021; Haddaway & Duggan, 2023).

2.1.5 Eco-emotions and coping in emerging environmental professionals

Research on negative eco-emotions among emerging environmental professionals (EEPs) is limited but suggests that young people and students in environmental disciplines are especially vulnerable (Daeninck et al., 2023; Ma et al., 2022). Studies from the UK and Australia show higher levels of eco-anxiety among these students compared to their peers in other fields, attributed to frequent exposure to environmental realities (Kelly, 2017; Wallace et al., 2020). This vulnerability is exacerbated by prevalent mental health challenges in universities and a lack of awareness among academic staff about the psychological effects of environmental education (Wallace et al., 2020).

Daeninck et al. (2023) emphasise the need to prioritise mental health in academia, noting that better support for EEPs is essential for empowering future environmental leaders. However, coping strategies in academic settings are often inadequate, with educators and students maintaining façades to meet professional and academic demands (Daeninck et al., 2023). Concepts like eco-emotions and ecopsychology are rarely included in curricula (Jacobson et al., 2012), leaving students feeling overwhelmed and unsupported, as illustrated by a University of Amsterdam student's remark: "In the first six months of studies, the message was: the climate cannot be solved. That is like telling a medical student that the patients cannot be cured" (Anonymous EEP, 2023, para. 25). Incorporating eco-emotions into education could improve EEPs' well-

being, reducing the risk of long-term mental health issues caused by prolonged exposure to anxiety-inducing conditions (Immordino-Yang et al., 2019; Wallace et al., 2020).

2.1.6 Eco-art therapy

Eco-art therapy involves creating art with natural materials or themes while reflecting on the process, enhancing self-awareness, understanding of others, and connection with nature (Pike, 2021). Rooted in ecopsychology, which explores the human-nature relationship, it addresses societal and psychological issues stemming from environmental disconnection and promotes well-being and sustainability (Fisher, 2002; Pike, 2021). By engaging the brain's creative right hemisphere, it can reawaken innate connections with nature (Slayton et al., 2010). Using natural materials like soil, stones, leaves, and branches, eco-art therapy is accessible and non-intimidating, requiring no artistic skills (Chang & Netzer, 2019). This approach fosters personal and emotional engagement, transforming environmental awareness into "embodied knowledge" (Renouf, 2021). It aims to equip individuals with coping skills for negative eco-emotions while promoting emotional well-being (Arun & Chandelkar, 2024). Though eco-art therapy may enhance participants' capacity to address environmental issues, evidence remains limited, and ongoing research is necessary (Lee et al., 2020).

2.1.7 Effectiveness

The therapeutic effects of art therapy on mental health are increasingly recognised (Jones, 2021; Maujean et al., 2014; Regev & Cohen-Yatziv, 2018; Slayton et al., 2010), but the specific mechanisms behind its effectiveness remain unclear (De Witte et al., 2021). Koch (2017) suggests that the interplay between creating and receiving art is key to therapeutic change, while factors like artistic projection, perspective-taking, emotional distance, and symbolism may also influence efficacy (Jones, 2021; Koch, 2017). De Witte et al. (2021) call for further exploration of these mechanisms. Van Lith (2016) critiques the field for neglecting participants' perspectives, which are essential for evaluating art therapy.

There is no consensus on the ideal duration or lasting effects of eco-art therapy. Regev and Cohen-Yatziv's (2018) scoping review of 17 studies found positive short-term effects from sessions as short as 60 minutes, with some studies including follow-up sessions. However, long-term effectiveness remains under-researched. Research on eco-artmaking often focuses on specific groups, showing benefits like enhanced self-esteem in siblings of children with disabilities (Regev & Cohen-Yatziv, 2018), improved environmental understanding in students (Sunassee

et al., 2021), and increased nature-connectedness in youth (Moula et al., 2022; Slayton et al., 2010). Lee et al. (2020) found that participants quickly opened up about their emotions. All studies involved a facilitator or therapist (Lee et al., 2020; Regev & Cohen-Yatziv, 2018). The only study on eco-artmaking for (E)EPs, by Haddaway and Duggan (2023), used a focus group to explore emotions in a "safe space." While the study revealed the benefits of a secure environment for sharing emotions and fostering community, its limitations include generalisability issues, selection biases, and potential researcher bias in transcript analysis.

2.2 Hypothesis

Drawing from the existing literature on eco-art therapy practised by EPs, the current study anticipated findings similar to those reported by Haddaway and Duggan (2023), where participants reported a therapeutic effect in dealing with eco-emotions. Additionally, it was hypothesised that engaging in an eco-artmaking session would facilitate emotional expression among participants, an emotional coping skill previously identified in an eco-art therapy study by Lee et al. (2020). These effects were measured by comparing sub-questions 1 and 2. When comparing the responses of EPs with those of EEPs, it was expected that EEPs would demonstrate greater comfort in expressing their emotions, owing to the generally higher emotional literacy among younger individuals, as identified by Alemdar and Anilan (2022) and Zembylas (2008). Sub-question 3, focusing on the therapeutic effect one week after the study, aimed to find proof for the hypothesis that eco-artmaking has lasting therapeutic effects on the emotional well-being of (E)EPs. Expected therapeutic effects included that participants would feel more comfortable discussing their eco-emotions, enjoy a stronger connection with nature, and feel less negatively impacted by the life-threatening implications of their work or study subjects.

2.3 Conceptual framework

This study explored the therapeutic effects of eco-artmaking on (E)EPs through a series of sub-questions. The conceptual framework depicted in Fig. 2 was used to guide the investigation of these questions. The first sub-question assessed their initial emotional state as influenced by work or study, measured at the Input stage. The second sub-question, measured at the Output stage, examined their emotional well-being immediately following the eco-artmaking session. The third sub-question investigated the therapeutic effects reported by the (E)EPs one week after the artmaking session.

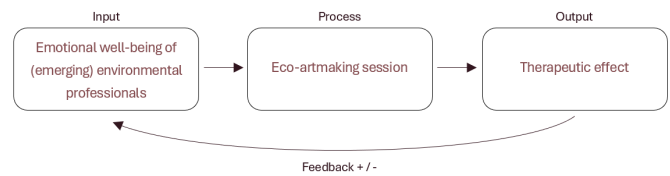


Figure 2: Assumed causal relationship between the emotional well-being of (E)EPs and an eco-artmaking session

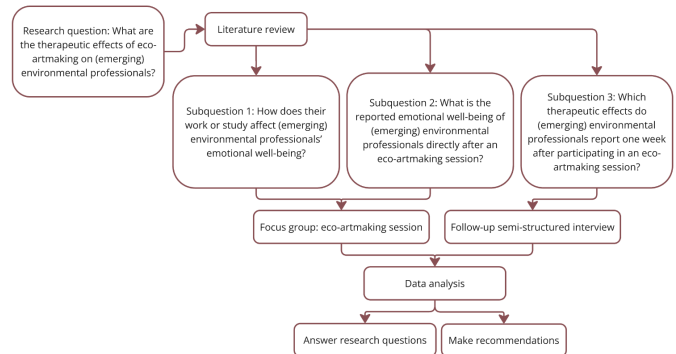


Figure 3: Methodological framework.

3. Methods

The main research question (What are the therapeutic effects of eco-artmaking on (emerging) environmental professionals?) was answered by organising a focus group in which participants engaged in an eco-artmaking session (Fig. 3). To answer sub-question 1 (How does their work or study affect (emerging) environmental professionals' emotional well-being?), this session started with a sharing session led by a facilitator in which participants were invited to share their eco-emotions. To answer sub-question 2 (What is the reported emotional well-being of (emerging) environmental professionals directly after an eco-artmaking session?), participants were instructed to work on a collaborative art project and to share how this practice made them feel. Sub-question 3 (Which therapeutic effects do (emerging) environmental professionals report one week after participating in an eco-artmaking session?) was answered using a follow-up semi-structured interview, in which participants were asked how they reflected on the therapeutic potential of the artmaking session.

3.1 Justification of methods

I used qualitative methods to allow participants to express their emotions and thoughts freely. Qualitative methods permit deep exploration of individual and group experiences (Rubin & Rubin, 2012). In addition, it would be beyond the scope of this paper to conduct quantitative research. The reason for using a focus group was that it allowed the generation of a substantial amount of data quickly. It also encouraged participants to share



Figure 4: The natural materials used in the eco-artmaking session.

their emotions in a group, which could aid them in developing their emotional literacy. Furthermore, by sharing their emotions openly, (E)EPs could benefit from peer support, which could combat feelings of isolation. A focus group was also expected to help discover collective perceptions, ideas, shared anxieties, and emotional responses. A follow-up semi-structured interview method was chosen as this gave participants a more private way to reflect on their experience, as their opinions expressed during the focus group may have been influenced by others.

3.2 Eco-artmaking session

Since studies had yet to attempt to assess the impact of eco-artmaking on (E)EPs, two sessions were organised specifically for these groups. A pilot study with test participants ($n=3$) took place on April 29, 2024, in Amsterdam. The findings of the pilot were adopted for the two sessions on May 17, 2024, in Amsterdam. The first focus group consisted of EPs ($n=4$) and the second of EEPs ($n=4$). Both focus groups engaged in the same two-hour eco-artmaking session guided by a facilitator. The reason for separating EPs from EEPs was to prevent power dynamics or issues regarding professional relations between participants within the group. This allowed to maintain a safe space where participants felt comfortable expressing their emotions. The sample size of 4 people was used because it was high enough to generate substantial data fitting for a study and small enough to maintain a safe space. Following the pilot study, and recommendations made by Lee et al. (2020), participants were instructed to create an artwork using natural materials such as branches, shells, cotton, dried flowers, rocks, leaves, and stones (Fig. 4).



Figure 5: Focus group location and set-up.

The intervention was guided by a professional facilitator experienced in guiding groups through artistic processes. The facilitator's role was to establish and maintain a space in which the participants felt safe and to maximise the session's effectiveness. Since focus groups may be prone to dominant participants, the facilitator also made sure everybody had a chance to speak up. This allowed the author to handle the study's technical requirements and make observations.

The intervention was held inside to allow easier control over distractions, weather, and the safety of the equipment. However, given the negative reported perception of using an interior space for an eco-art therapy intervention made by Lee et al. (2020), a room with large sliding doors that could connect the area to a garden was used. The room was in Housing Cooperative De Warren (Fig. 5). A printout of Plutchik's Wheel of Emotions was used as a conversation starter.

The eco-artmaking sessions lasted 120 minutes each. First, participants were welcomed by the facilitator and the researcher, introduced to the Wheel of Emotions, and invited to share how their daily engagement with environmental challenges through their work or study made them feel. Second, they were instructed to make an art piece with natural materials. Third, they were asked to express their feelings and reflect on the artwork's creation process. The session's goal was to give participants the experience of an eco-art therapy session and to collect the data required to answer the research questions.

3.3 Follow-up interview

One week after the artmaking session, participants were interviewed by telephone. Through a pilot study, it was decided that conducting the interview one week after the

Table 1: Participant table

Group	ID	Occupation	Age
EP	1	PhD candidate	27
	2	Researcher	27
	3	PhD candidate	26
	4	Innovation analyst	29
EEP	5	Master student	24
	6	Master student	28
	7	Master student	27
	8	Master student	25

artmaking session gave participants enough time to reflect on the session while still having a strong memory of the experience. Interviews lasted an average of 17 minutes. A phone call was chosen to lower the barrier for participants to take part in the study. The interviews served to answer sub-question 3 (How do (emerging) environmental professionals describe their experience one week after participation in an eco-artmaking session?). The interview focused on how participants experienced sharing their emotions in the group and how they felt about creating the artwork. They were also asked to describe what they found helpful about the session and what they thought could be improved. Particular attention was given to their thoughts about the study's design and whether they had experienced any therapeutic effects. Guiding questions were shaped by pilot interviews on May 6, 2024. The actual interviews were on May 24 and 27, 2024.

3.4 Participants

Two focus groups took place: one group comprised of EPs and the other of EEPs, as delineated in Table 2. Participants were recruited using a poster, distributed digitally through WhatsApp groups and contacting potential (E)EPs directly. Additionally, twenty physical copies of the poster were distributed across three academic institutions: Vrije Universiteit, University of Amsterdam, and Amsterdam University of Applied Sciences. The focus groups were conducted in English, necessitating that all participants possessed a proficient level of English. All participants were Western European and all but one lived in Amsterdam during the study. None of the participants had mental health issues.

3.5 Data collection and analysis

Qualitative data was collected during the artmaking session and the follow-up interview. During the session, two cameras and audio recorders were used. Audiovisual documentation clarified what participants were referring to, especially when gesturing at the artwork. This footage

was compiled in Adobe Premiere. MacWhisper was used for transcription. The phone calls for the follow-up interview were recorded using two devices and transcribed with MacWhisper.

ATLAS.ti was used to code and identify themes in the focus groups and the interviews. Theory-driven and data-driven codes were used to make a codebook. Different sources were used to compile the theory-driven codes. Plutchick's Wheel of Emotions categorised emotions into positive, negative, and neutral. Note that some emotions, such as surprise and amazement, were classified as positive and negative. Similar studies (Chang & Netzer, 2019; Haddaway & Duggan, 2023; Lee et al., 2020) provided codes about the therapeutic effects of the artmaking session. Data-driven codes were made in a bottom-up process by reading the transcripts of the pilot and the artmaking session multiple times and adding and modifying codes where necessary.

3.6 Ethical considerations

For ethical reasons, the recommendations made by Teachers College Columbia University (n.d.) and the VU LibGuide on Research Data Management (Vrije Universiteit, 2024) were followed. Although existing literature did not report mental health risks, the methodology called for a clear consent form. This way, participants would know what to expect and were reminded that they could pause or withdraw from the study at any point. Furthermore, if needed, resources to psychologists were be provided. During the session, the facilitator looked out for signs of anxiety and was ready to pause the session if needed. Participants were not confronted with unwanted or distressing stimuli such as graphic images, and no high-risk groups, such as climate-depressed people, were included. Finally, it was ensured that the space was safe, secure, hygienic, and private.

4. Results

This chapter answers the sub-questions for both groups, concluding with an overarching answer to the main research question. In summary, the study finds that (E)EPs reported varied emotions before artmaking, with a slight shift to positive feelings after. Though participants underscoring the therapeutic potential of eco-artmaking, its positive effects faded within days. Since the sample groups were comparable in both composition (see Table 1) and their experiences during the eco-artmaking session, it was decided to present their results collectively. Any significant differences between the two groups will be highlighted.

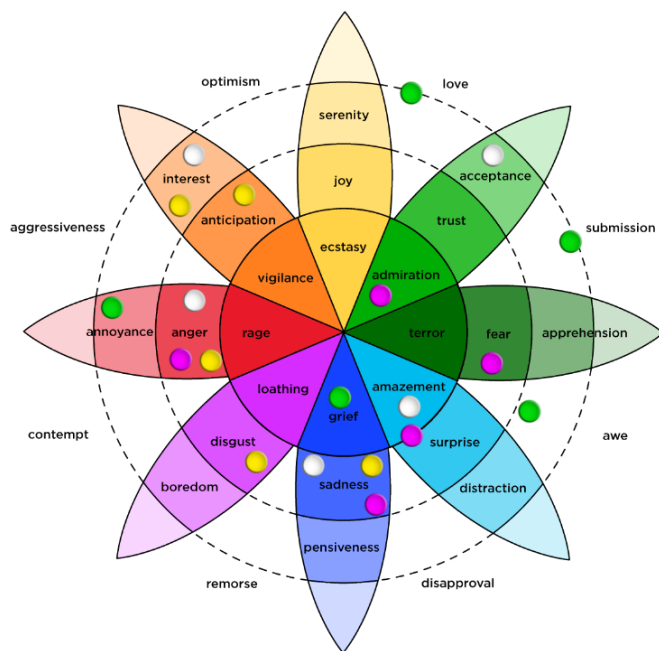


Figure 6: Emotions in EPs before artmaking.

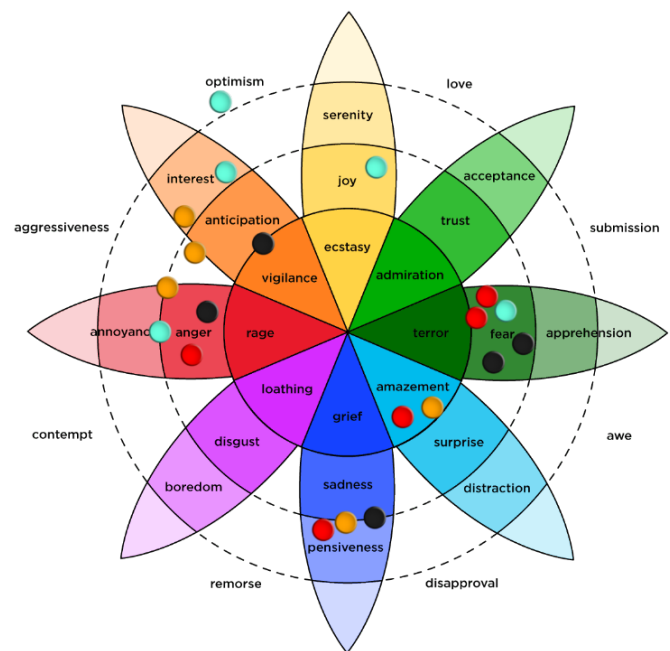


Figure 7: Emotions in EEPs before artmaking.

4.1 Outcomes

4.1.1 How does their work or study affect (emerging) environmental professionals' emotional well-being?

The question "When you think about your work or study regarding the environment, which emotions come to mind?" sparked responses in all petals of the Wheel of Emotions (Figs. 6 and 7). However, EPs did not mention intensely positive emotions like serenity and joy (yellow petals). EEPs did not report acceptant or negative emotions (green and purple petals), such as trust and disgust. EEPs made more use of displaying the intensity of their emotions through the stickers by labelling certain emotions or areas twice (see the double red and black stickers in fear and the orange area between interest, anticipation and anger).

In conversation, the most frequently mentioned emotion (Figs. 8 and 9) was anger ($n=13$ in EPs and $n=9$ in EEPs). Sadness was mentioned 12 times by three EPs and 7 times by one EEP. Three EEPs made eight mentions of fear, while the third most frequent emotion mentioned by EPs was amazement ($n=7$), mentioned by two participants.

EPs and EEPs reported that different triggers cause their anger. One recurring trigger is feeling powerless against the ecologically destructive decisions of politicians and companies. (E)EPs voiced their anger about a focus on short-term solutions and money-making. Other anger-inducing problems are wars and conflict, injustice and inequality, and a general dread towards voters uninterested in caring for the environment. Furthermore, anger is experienced while reading or watching the news and during

work. One EP explained that their work often focused on problem statements such as governments and companies unwilling to cooperate, making ecologically adverse compromises on much-needed solutions. By focusing for extended periods on these issues, the participant noted that anger sometimes overwhelmed them.

EPs reported that their anger regularly shifts to sadness and back again. Like anger, sadness is often triggered by news media, mainly when focusing on the human drama of natural disasters, such as displacement, famine and war. In some cases, sadness towards other species is also felt. EEPs also noted that their studies and lectures make them experience sadness. Though not all the EEPs placed a sticker in the dimension of fear, two participants placed multiple stickers here to emphasise how strongly they experience this feeling. The principal trigger of fear is future projection. In the words of one EEP:

"When I see pictures of natural catastrophes in the news, then, of course, I'm sad for the people who are going through these catastrophes now. But then it shifts more into a fear for the future, like how our world will look in maybe 50 years. What if I have children? What is the world going to mean for them? How are we going to live here? Are we just going to kill ourselves with our actions? I think we're all just really scared of how our world will change at some point because it will. It's already happening."

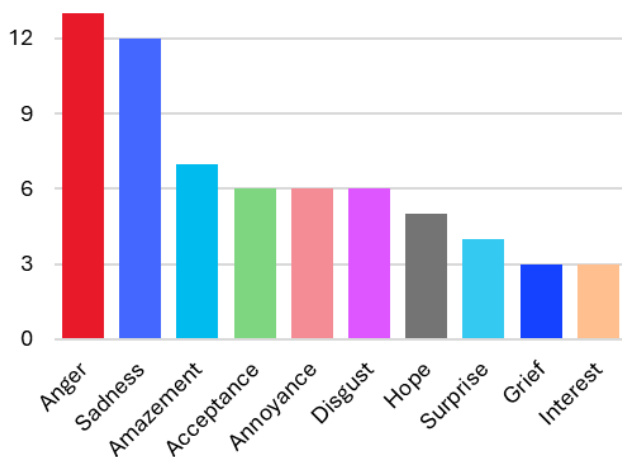


Figure 8: Emotions mentioned by EPs before artmaking.

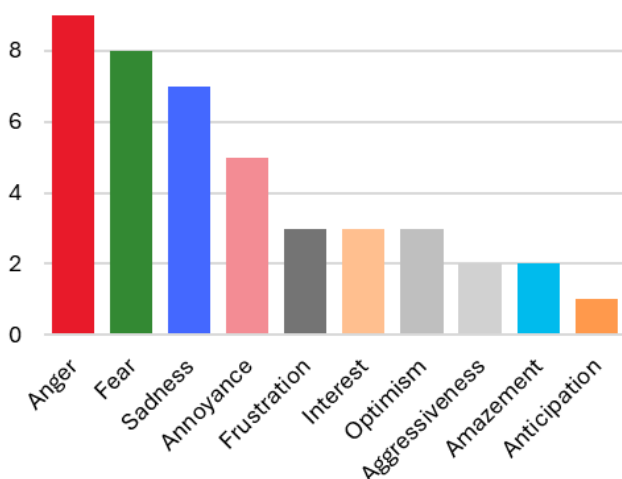


Figure 9: Emotions mentioned by EEPs before artmaking.

Two EPs mentioned amazement seven times. They reported finding joy in their research, innovative and adaptive solutions against environmental change, and the beauty of nature itself. However, amazement was not solely mentioned as a positive emotion. The same participant (white sticker on Fig. 6) noted their amazement could also be sparked by “the constant blaming of others.”

Annoyance ($n=5$) and frustration ($n=3$) experienced by at least three EEPs is triggered by bad coordination and collaboration between different actors such as governments, NGOs, companies and other stakeholders. Another trigger for these emotions is people not taking environmental issues seriously and companies and governments not recognising their responsibility. EPs mentioned acceptance, annoyance and disgust six times. One EP explained how they have come to peace with the fact that “Some parts are not going to be changed anymore.” Annoyance was reported as a milder version of anger, reportedly induced by ignorance and a lack of agency. Disgust was mentioned to be triggered by a perceived carelessness of people in power and a focus on money-making.

Two EEPs reported interest ($n=3$) from curiosity about Earth systems and “the different relations between everything.” Two EPs explained interest ($n=3$) as a curiosity about the planet, its systems and “how things will unfold.” One EEP reported being optimistic ($n=3$) about the opportunities for change and innovation whilst also feeling aggressive ($n=2$) as they keep learning about the trade-offs and blockades that hamper these changes. Two EEPs mentioned amazement ($n=2$) in response to humanity’s inability to solve environmental crises and the “efforts made by people to make things better.” EEPs used anticipation ($n=1$) to describe a sceptical stance while waiting for future events to unfold.

Though absent in the wheel, two EPs mentioned hope ($n=6$) as a motivator to keep working in the environmental sciences and as a desire for structural change. Two EPs expressed surprise ($n=4$) at nature’s ability to restore itself, learning new facts about the environment and sociopolitical developments in the world. One EP described grief ($n=3$) as a deeply felt emotion and a more irrevocable version of sadness.

4.1.2 What is the reported emotional well-being of (emerging) environmental professionals directly after an eco-artmaking session?

After making the artwork (Figs. 10 and 11), we asked participants the same question as before. Both groups reported increased positive emotions (Figs. 12 and 13). EPs experienced serenity ($n=3$), hope ($n=2$) and joy ($n=2$)



Figure 10: Artwork conceived by EPs.



Figure 11: Artwork conceived by EEPs.

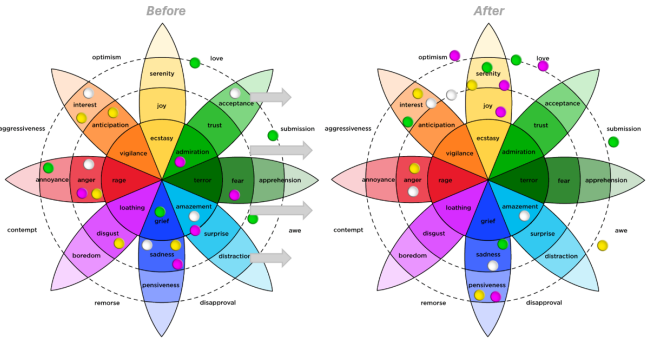


Figure 12: Emotions in EPs before and after artmaking.

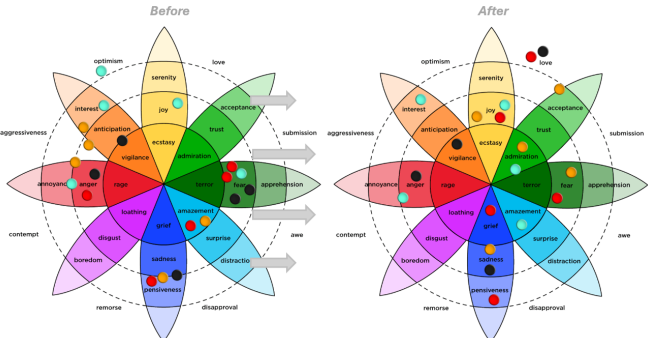


Figure 13: Emotions in EEPs before and after artmaking.

(Fig. 14). EEPs mentioned love (n=5), fear (n=4), and optimism (n=4), replacing anger (n=1) from its initial first position (Fig. 15). Participants in both groups remarked that this shift towards more positive emotions was likely only temporal.

Participants in both groups reported feeling serene (n=3 in EPs), more relaxed (n=2 in EEPs), and at peace after making the artwork compared to before the experiment. Two EEPs mentioned love (n=5) in response to the physical sensations of working with natural materials and nature's ability to put participants in touch with their deeper emotions. An EEP who previously claimed not to experience any fear (n=4) now described how working with the materials had made them afraid of the fragility of nature:

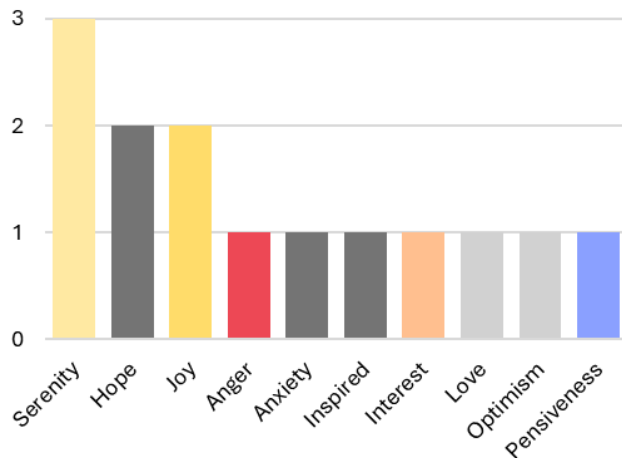


Figure 14: Emotions mentioned by EPs after artmaking.

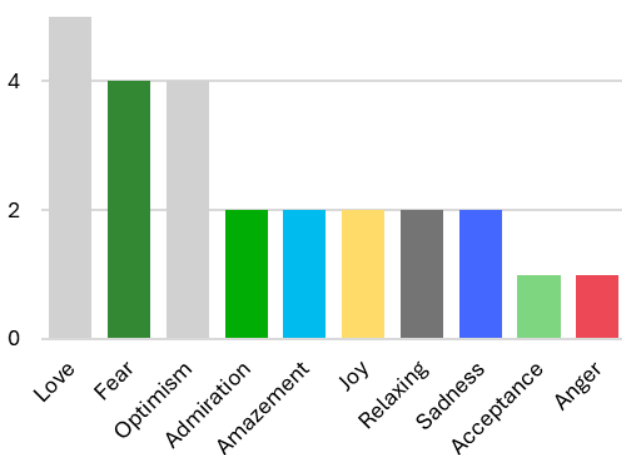


Figure 15: Emotions mentioned by EEPs after artmaking.

"I said I don't really feel that fear because I think you can adapt to any situation, and I will be fine. But now that I see nature maybe more as a vulnerable thing, and of course, it can regenerate, but I also feel fear that it will be destroyed."

Hope was expressed by two EPs about the community-feeling that arose during the artmaking process:

"Working together on this project and seeing other people are busy with the environment makes me hopeful. I still believe some things are fucked, but seeing people care about change will make you more hopeful."

Participants in both groups noted that the sensory experience from the materials made them feel joy ($n=2$ in EPs and EEPs), admiration, amazement and relaxation ($n=2$ in EEPs). One EEP mentioned optimism ($n=4$) as a reflection of the beauty of nature, which allowed them to stop focusing on the negative parts. An EP and an EEP commented that the positive feelings were "masking the anger" ($n=1$) that they still felt underneath:

"Right now, my emotions are more towards my group. Maybe once I sit in front of my computer and think about how much is going wrong, I will feel the anger again."

Other participants echoed this sentiment, indicating a lack of long-term therapeutic effects. An EEP reporting fear and sadness ($n=2$) worried that it was impossible to preserve nature. Another EEP mentioned acceptance ($n=1$) as a state of coming to terms with the fact that "not all can be saved."

One EP commented that they felt inspired ($n=1$) after the session, expressing a desire to hold onto its effects in the longer term. Interest ($n=1$) was mentioned by another, who reported increased nature connectedness. Love ($n=1$) and optimism ($n=1$) were targeted at nature's beauty and ability to care for itself. Pensiveness ($n=1$) was reported by an EP who felt more mindful.

4.1.3 Which therapeutic effects do (emerging) environmental professionals report one week after participating in an eco-artmaking session?

Although (E)EPs described the eco-artmaking session as a positive experience, they observed that the positive emotions faded quickly after resuming work or studies. To have a lasting therapeutic effect, they suggested participating in regular sessions. In the hours following the end of the session, two EPs recalled feeling a strong love for nature:

"I felt calm, a lot of solitude and tranquillity, quiet. I also felt more in touch with my surroundings. I felt like my senses were strengthened, so I could hear the birds and the wind more. I was also moving slower."

EEPs reported feeling energised, serene and calm after participating and more appreciative of nature. Two EEPs noted a "physical transition", comparing it to the high they experience after a yoga class. They attributed this to the meditative qualities of touching the textures of the materials. One EEP reflected that looking at the perfection of their carefully created artwork had sparked them with hope and a better sense of what they want the future to look like:

"My main insight was that we created all those little ecosystems within our artwork, and they were so perfect. Like, there was no plastic in the beach environment, there was no coral bleaching in the coral environment, no glacier melting in the mountains, so we built this beautifully perfect picture, and I think that gave me... I think it gave me hope that I know what I'm fighting for, and I know that I'm... That it's not too late, actually, whereas before, I think I was more negative."

One EP reported that working with and listening to other professionals had helped them uncover new emotions within themselves:

"Some of the things I heard them say I recognised also within myself, but I wouldn't think of it from the top of my head. So, it was more like someone would say something and I would be like, 'Oh yeah, I feel the same way. I feel like this as well.' It made you think a lot more than I guess when you're by yourself."

An EEP explained that the artmaking session had not changed how they felt about their environmental studies, but it still made them feel better in the moment:

"I don't feel personally for me that those [eco-emotions] become less strong because of eco-art therapy. It's more my more generic, direct, day-to-day emotions of how peaceful I feel. And those day-to-day emotions were more positive following the session."

Despite these positive effects, the eco-artmaking session did not negate any of the earlier reported negative eco-emotions. One EP explained that they still found the session therapeutic as positive and negative emotions may be able to exist alongside each other:

"I think these feelings can probably co-exist so you can at the same time have these deeper negative emotions, but also these positive emotions. And those can exist together at the same time. I think for me what helped the most is just feeling, I don't know, I felt a bit lighter afterwards. So, I guess it helps in a sense that you feel, you still feel the same emotions, but you feel maybe different about those emotions. But they're still there."

EEPs echoed the absence of long-term effects. One noted that its effects were strong on the day of the session but faded in the days following. A sudden shift in mood was experienced by all EPs when they went back to work and were confronted with environmental challenges:

"It [negative feelings] came back when I opened my email. So that in a way really confronts you with the things that still exists, like the problems still exists. I think just in general working on these problems made the feelings come back."

EEPs noted that the positive effects faded because of other emotions taking their place, the passing of time, and returning to their studies. All participants expressed an interest in follow-up sessions, with a desired frequency between once a week and twice a year. They suggested that a series could involve individual assignments, focusing less on emotions after the initial session, explicitly teaching how to implement positive thinking in day-to-day life, working outside, and mixing people with different backgrounds and ages. One EP emphasised the responsibility of a facilitator or a qualified therapist, especially when guiding vulnerable people. Participants of both groups preferred engaging in groups made up of peers. This was mainly because this enabled a safe space where they felt free to express emotions without judgment from people they perceived to be better informed. One EEP noted:

"Maybe if you work with someone that is on a very high level academically, then you think like, oh no, maybe this sounds stupid, and it's not correct what I'm saying."

4.2 Therapeutic effect

To answer the main research question of this study (What are the therapeutic effects of eco-artmaking on (emerging) environmental professionals?), the results indicate that eco-artmaking enables (E)EPs to temporarily feel more positive about the environment in their study or profession. After participating in the eco-artmaking session, (E)EPs reported feelings of happiness, relaxation, inspiration, awe, and an increased connection with nature. No evidence for long-term effects could be found.

4.3 Other findings

Additionally, this study provides anecdotal evidence suggesting that “emotions of different colours may be able to live next to each other.” For instance, one participant noted feeling sad about political inaction, amazed by nature’s ability to restore itself, and hopeful about the spirit of young people, all at the same time.

All participants commended the artmaking session’s setup and its focus on working with natural materials in a group. One EP noted that if the artmaking had been an individual assignment, this would have raised the pressure to create something artistically impressive. One EPP noted that talking about participating in the artmaking session helped them in speaking about their eco-emotions:

“At first, I was answering questions more in an environmental student way instead of maybe my personal ideas and things. I was answering like: ‘We learned this in our program, and this class was really interesting, and I really liked these ideas,’ instead of saying: ‘I feel this way and not referring to any class lecture or literature or whatever. And that is because we are trained to back everything up with sources, with literature. So now I was finally thinking about my own relation with nature and expressing my opinion.”

Participants in both groups criticised the Wheel of Emotions. Despite its clever design, which uses clear colours, opposing emotions, and different intensities, participants missed emotions, particularly hope and anxiety. EEPs were less critical of the wheel but struggled to understand and translate some terms into their language, particularly vigilance and apprehension.

5. Discussion

This research project focused on the emotional impact that (E)EPs experience in their work and study and whether eco-artmaking could be a therapeutic tool to address eco-emotions. The results indicate that (E)EPs com-

mend eco-artmaking for its therapeutic ability in the short term, but the study provides no evidence of its long-term effects.

5.1 Interpretations and implications

This study is the first to examine the therapeutic impact of eco-artmaking on (E)EPs. Despite not employing a professional therapist, therapeutic effects were still reported. It shows that (E)EPs, who face strong eco-emotions in their work and studies, can experience positive emotions through eco-artmaking. The sessions helped redirect their thoughts from stress towards physical creation, with natural materials offering a relaxing sensory experience. The group dynamic fostered trust, and after sharing their feelings, participants felt more relaxed and connected to their emotions. However, these positive effects faded by the weekend, overtaken by the grind of daily frustrations about work or studies.

The positive effects of the session are attributed to participants’ openness and the artmaking process, which acted as a form of meditation. Similar studies, such as those by Chang and Netzer (2019), Figueroa (2023) and Lee et al. (2020), also show that eco-art therapy improves participant well-being. The use of natural materials, which are less intimidating than traditional art supplies, proved particularly beneficial, aligning with findings from Chang and Netzer (2019). Group assignments, as supported by Paulus et al. (2021), encouraged interaction, creating a safe space for discussing eco-emotions. Participants also reported increased nature-connectedness, similar to studies by Moula et al. (2022) and Slayton et al. (2010), and found it easy to talk openly about their emotions.

The session’s design was generally well-received, though one participant preferred an outdoor setting, which has been found to be more effective in eco-art therapy Lee et al. (2020). Various other creative methods, such as dance, photography, and music, could also be effective (Kopytin, 2021). However, the session did not enhance participants’ understanding of environmental issues, likely because they were already well-informed. The eco-emotions expressed, such as anger, sadness, and joy, align with previous research by Clayton (2018) and others. Interestingly, students reported more fear than professionals, possibly due to generational differences or the context of their studies.

Despite the positive effects, negative eco-emotions persisted, potentially explained by distress intolerance (Saulsman & Nathan, 2012). Participants reported that positive and negative emotions could coexist, supporting Pihkala (2022) findings. No significant differences between

the two groups were observed, possibly due to their similar age (late twenties). The interest in follow-up sessions aligns with Gilford et al. (2019), advocating for more support for EPs' emotional well-being. However, the effectiveness of longer or more frequent sessions remains unclear, as noted in studies by Hill et al. (2016) and Moula et al. (2022). The sustainability of therapy effects may depend on session frequency and ongoing engagement with nature (Joschko et al., 2022).

5.2 Limitations

This study's limitations include a small sample size, biases, and the fact that it only involved one session, making it difficult to generalise the results to the broader (E)EP population. Only eight participants volunteered, with an average age of 27.3 for EPs and 26 for EEPs, and three of the four participants in both groups knew each other beforehand. While EPs and EEPs were separated to create a safe space, the prior familiarity among participants limits conclusions about the group dynamic's impact.

Self-selection bias may have occurred, as participants were likely motivated and interested in eco-emotions or eco-artmaking. There was also potential social desirability bias, as two EPs admitted to struggling to provide pure answers that were true to their feelings. Recall bias could have influenced the follow-up interview, but no clear evidence suggested this. Participants found the one-week interval suitable for reflecting on the session. The interview process may have introduced some bias, as questions were designed to help participants recall their feelings. Additionally, the study's limited duration of only one session is a constraint.

Despite these limitations, the results are valid for assessing the therapeutic effects of eco-artmaking on (E)EPs' emotional well-being. Every participant reported a positive change after the session, and the desire for follow-up sessions suggests eco-artmaking can positively impact (E)EPs' emotional well-being.

5.3 Recommendations

This study highlights the strong eco-emotions of (E)EPs, suggesting a need for better emotional management tools. It proposes eco-artmaking as an effective way to address these eco-emotions, though similar creative group assignments using natural elements may also be beneficial.

Practically, (E)EPs could benefit from regular eco-artmaking sessions, either individually or in groups, with or without a facilitator. Since participants preferred group sessions, these should be organised more broadly within organizations and academic settings.

Further research is needed to determine if follow-up sessions improve the long-term impact of eco-artmaking. Longitudinal studies with larger sample sizes and exploration of alternative nature-based therapies, like wilderness or horticultural therapy, are needed (Arun & Chandekar, 2024). Studies should also investigate differences in eco-emotions between EPs and EEPs, as well as the effectiveness of outdoor vs. indoor eco-art therapy (Lee et al., 2020).

Finally, some participants found the Wheel of Emotions too limited, prompting a need for alternative conversation starters, like asking questions about climate change (Nielsen, n.d.) or using tools like Figueroa's spectrogram (2023). The PAD Emotional State Model (Pleasure, Arousal, Dominance) could also be a useful alternative for exploring a broader range of eco-emotions (Mehrabian, 1996).

6. Conclusion

This study explored whether an eco-artmaking session could have a therapeutic effect on (E)EPs, who face a disproportionate mental burden from continuous exposure to environmental crises. The results indicate that eco-artmaking provided a temporary emotional boost, with participants reporting more positive emotions immediately after the session. However, these effects faded shortly after they returned to their work and studies. The emotional well-being of (E)EPs is deeply influenced by their work. While eco-artmaking did not erase the underlying negative eco-emotions, it allowed for co-existence with positive feelings, such as calmness from working with natural materials. One week later, the therapeutic effects had mostly dissipated, but participants still valued the session for its emotional benefits. The study suggests that eco-artmaking serves as a short-term coping mechanism by fostering emotional expression and connection with nature. Participants expressed interest in more follow-up sessions, though the benefit of such a series remains unclear. Integrating eco-artmaking sessions into academic or organizational structures could provide ongoing support for (E)EPs. Given the small sample size and qualitative nature of the research, further longitudinal studies are needed to assess the long-term therapeutic potential of eco-artmaking. In conclusion, while eco-artmaking shows promise as a short-term emotional management tool, a more comprehensive approach is needed to address the long-term psychological challenges faced by (E)EPs. This study paves the way for further exploration into innovative strategies for supporting the well-being of those dedicated to solving environmental crises.

7. Bibliography

1. Albrecht, G. (2011). Chronic Environmental Change: Emerging 'Psychoterratic' Syndromes. In I. Weissbecker (Ed.), *Climate Change and Human Well-Being* (pp. 43–56). Springer New York. https://doi.org/10.1007/978-1-4419-9742-5_3
2. Albrecht, G., Sartore, G.-M., Connor, L., Higginbotham, N., Freeman, S., Kelly, B., Stain, H., Tonna, A., & Pol-lard, G. (2007). Solastalgia: The Distress Caused by Environmental Change. *Australasian Psychiatry*, 15(1_suppl), S95–S98. <https://doi.org/10.1080/10398560701701288>
3. Alemdar, M., & Anilan, H. (2022). The Development and Validation of the Emotional Literacy Skills Scale. *International Journal of Contemporary Educational Research*, 7(2), 258–270. <https://doi.org/10.33200/ijcer.757853>
4. Anonymous EEP. (2023). Kun je depressief worden van klimaatverandering? (Sija van den Beukel, Interviewer) [Folia]. <https://www.folia.nl/actueel/159134/kun-je-depressief-worden-van-klimaatverandering>
5. Arun, J., & Chandelkar, S. (2024). Ecopsychology and Nature-Based Interventions: Exploring Therapeutic Benefits and Integration into Mental Health Nursing Practice. *International Journal of Nursing Research*, 5(1):279, 279–283. https://www.researchgate.net/publication/378968953_Ecopsychology_and_Nature-Based_Interventions_Exploring_Therapeutic_Benefits_and_Integration_into_Mental_Health_Nursing_Practice
6. Barrett, L. F., Gross, J., Christensen, T. C., & Benvenuto, M. (2001). Knowing what you're feeling and knowing what to do about it: Mapping the relation between emotion differentiation and emotion regulation. *Cognition & Emotion*, 15(6), 713–724. <https://doi.org/10.1080/02699930143000239>
7. Baudon, P., & Jachens, L. (2021). A Scoping Review of Interventions for the Treatment of Eco-Anxiety. *International Journal of Environmental Research and Public Health*, 18(18), 9636. <https://doi.org/10.3390/ijerph18189636>
8. Bhullar, N., Davis, M., Kumar, R., Nunn, P., & Rickwood, D. (2022). Climate anxiety does not need a diagnosis of a mental health disorder. *The Lancet Planetary Health*, 6(5), e383. [https://doi.org/10.1016/S2542-5196\(22\)00072-9](https://doi.org/10.1016/S2542-5196(22)00072-9)
9. Blum, S., Brow, M., & Silver, R. C. (2012). Coping. In *Encyclopedia of Human Behavior* (pp. 596–601). Elsevier. <https://doi.org/10.1016/B978-0-12-375000-6.00110-5>
10. Bourban, M. (2023). Eco-Anxiety and the Responses of Ecological Citizenship and Mindfulness. In J. Jay Kassiola & T. W. Luke (Eds.), *The Palgrave Handbook of Environmental Politics and Theory* (pp. 65–88). Springer International Publishing. https://doi.org/10.1007/978-3-031-14346-5_4
11. Braniecka, A., Trzebińska, E., Dowgiert, A., & Wytykowska, A. (2014). Mixed Emotions and Coping: The Benefits of Secondary Emotions. *PLoS ONE*, 9(8), e103940. <https://doi.org/10.1371/journal.pone.0103940>
12. Brueckner, M., & Ross, D. (2019). In the public interest. In D. Ross, M. Bruecker, M. Palmer, & W. Eaglehawk (Eds.), *Eco-activism and social work* (p. 200). Routledge.
13. Brysse, K., Oreskes, N., O'Reilly, J., & Oppenheimer, M. (2013). Climate change prediction: Erring on the side of least drama? *Global Environmental Change*, 23(1), 327–337. <https://doi.org/10.1016/j.gloenvcha.2012.10.008>
14. Chang, M., & Netzer, D. (2019). Exploring Natural Materials: Creative Stress-Reduction for Urban Working Adults. *Journal of Creativity in Mental Health*, 14(2), 152–168. <https://doi.org/10.1080/15401383.2019.1568940>
15. Clayton, S. (2018). Mental health risk and resilience among climate scientists. *Nature Climate Change*, 8(4), 260–261. <https://doi.org/10.1038/s41558-018-0123-z>
16. Clayton, S. (2020). Climate anxiety: Psychological responses to climate change. *Journal of Anxiety Disorders*, 74, 102263. <https://doi.org/10.1016/j.janxdis.2020.102263>
17. Clayton, S., Koehn, A., & Grover, E. (2013). Making Sense of the Senseless: Identity, Justice, and the Framing of Environmental Crises. *Social Justice Research*, 26(3), 301–319. <https://doi.org/10.1007/s11211-013-0185-z>
18. Clayton, S., Manning, C., Krygsmann, K., & Speiser, M. (2017). Mental health and our changing climate: Impacts, implications, and guidance. American Psychological Association, and ecoAmerica. <https://www.apa.org/news/press/releases/2017/03/mental-health-climate.pdf>
19. Coffey, Y., Bhullar, N., Durkin, J., Islam, M. S., & Usher, K. (2021). Understanding Eco-anxiety: A Systematic Scoping Review of Current Literature and Identified Knowledge Gaps. *The Journal of Climate Change and Health*, 3, 100047. <https://doi.org/10.1016/j.joclim.2021.100047>
20. Coulter, L. (2018). Future climate narratives: Knowledge informing climate change adaptation. <https://doi.org/10.25904/1912/2623>
21. Cunsolo, A., & Ellis, N. R. (2018). Ecological grief as a mental health response to climate change-related loss. *Nature Climate Change*, 8(4), 275–281. <https://doi.org/10.1038/s41558-018-0092-2>

22. Daeninck, C., Kioupi, V., & Vercammen, A. (2023). Climate anxiety, coping strategies and planning for the future in environmental degree students in the UK. *Frontiers in Psychology*, 14, 1126031. <https://doi.org/10.3389/fpsyg.2023.1126031>
23. De Witte, M., Orkibi, H., Zarate, R., Karkou, V., Saj-nani, N., Malhotra, B., Ho, R. T. H., Kaimal, G., Baker, F. A., & Koch, S. C. (2021). From Therapeutic Factors to Mechanisms of Change in the Creative Arts Therapies: A Scoping Review. *Frontiers in Psychology*, 12, 678397. <https://doi.org/10.3389/fpsyg.2021.678397>
24. Delroy L., P., & Simine, V. (2007). The Self-Report Method. In R. Richard W., F. R. Chris, & F. Robert F. (Eds.), *Handbook of research methods in personality psychology* (pp. 224–239). The Guilford Press.
25. DiPietro, C. (2016). Art in the Anthro-pocene: Confronting Global Environmental Change Through Aesthetic Platforms [Dissertation, Bates College]. http://scarab.bates.edu/envr_studies_theses/108
26. Duggan, J., Haddaway, N. R., & Badullovich, N. (2021). Climate emotions: It is ok to feel the way you do. *The Lancet Planetary Health*, 5(12), e854–e855. [https://doi.org/10.1016/S2542-5196\(21\)00318-1](https://doi.org/10.1016/S2542-5196(21)00318-1)
27. Figueroa, V. (2023). Culturally Centered Eco-Art Therapy Practice for Self-Awareness: Development of a Method [Lesley University]. https://digitalcommons.lesley.edu/cgi/viewcontent.cgi?article=1749&context=expressive_theses
28. Fisher, A. (2002). *Radical ecopsychology: Psychology in the service of life*. State University of New York Press.
29. Gilford, D., Moser, S., DePodwin, B., Molton, R., & Watson, S. (2019). The Emotional Toll of Climate Change on Science Professionals. *Eos*. <https://eos.org/features/the-emotional-toll-of-climate-change-on-science-professionals>
30. Haddaway, N. R., & Duggan, J. (2023). 'Safe spaces' and community building for climate scientists, exploring emotions through a case study. *Global Environmental Psychology*, 1, e11347. <https://doi.org/10.5964/gep.11347>
31. Hayes, K., Blashki, G., Wiseman, J., Burke, S., & Reifels, L. (2018). Climate change and mental health: Risks, impacts and priority actions. *International Journal of Mental Health Systems*, 12(1), 28. <https://doi.org/10.1186/s13033-018-0210-6>
32. Head, L., & Harada, T. (2017). Keeping the heart a long way from the brain: The emotional labour of climate scientists. *Emotion, Space and Society*, 24, 34–41. <https://doi.org/10.1016/j.emospa.2017.07.005>
33. Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E. E., Wray, B., Mellor, C., & 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. [https://doi.org/10.1016/S2542-5196\(21\)00278-3](https://doi.org/10.1016/S2542-5196(21)00278-3)
34. Higginbotham, N., Connor, L., Albrecht, G., Freeman, S., & Agho, K. (2007). Validation of an Environmental Distress Scale. *EcoHealth*, 3(4), 245–254. <https://doi.org/10.1007/s10393-006-0069-x>
35. Hill, K. G., Woodward, D., Woelfel, T., Hawkins, J. D., & Green, S. (2016). Planning for Long-Term Follow-Up: Strategies Learned from Longitudinal Studies. *Prevention Science*, 17(7), 806–818. <https://doi.org/10.1007/s11121-015-0610-7>
36. Hoggett, P., & Randall, R. (2018). Engaging with Climate Change: Comparing the Cultures of Science and Activism. *Environmental Values*, 27(3), 223–243. <https://doi.org/10.3197/096327118X15217309300813>
37. Hrabok, M., Delorme, A., & Agyapong, V. I. O. (2020). Threats to Mental Health and Well-Being Associated with Climate Change. *Journal of Anxiety Disorders*, 76, 102295. <https://doi.org/10.1016/j.janxdis.2020.102295>
38. Immordino-Yang, M. H., Darling-Hammond, L., & Krone, C. R. (2019). Nurturing Nature: How Brain Development Is Inherently Social and Emotional, and What This Means for Education. *Educational Psychologist*, 54(3), 185–204. <https://doi.org/10.1080/00461520.2019.1633924>
39. Jacobson, S. K., Carlton, J. S., & Devitt, S. E. C. (2012). Infusing the Psychology of Climate Change into Environmental Curricula. *Ecopsychology*, 4(2), 94–101. <https://doi.org/10.1089/eco.2012.0014>
40. Jain, N., & Jain, P. (2022). Eco-Anxiety and Environmental Concern as Predictors of Eco-Activism. *IOP Conference Series: Earth and Environmental Science*, 1084(1), 012007. <https://doi.org/10.1088/1755-1315/1084/1/012007>
41. Johnson, A. A. (2021). Pathworking: A Mixed Methods Study of Eco-Art Therapy and Mindfulness in Women with Eating Disorders [Saint Mary-of-the-Woods College]. <https://scholars.smwc.edu/server/api/core/bitstreams/1ed663cb-9c83-4d79-95ef-10d645c26eb0/content>
42. Jones, P. (2021). *The arts therapies: A revolution in healthcare* (Second edition). Routledge.
43. Joschko, R., Roll, S., Willich, S. N., & Berghöfer, A. (2022). The effect of active visual art therapy on health outcomes: Protocol of a systematic review of randomised controlled trials. *Systematic Reviews*, 11(1), 96. <https://doi.org/10.1186/s13643-022-01976-7>

44. Kelly, A. (2017). Eco-Anxiety at University: Student Experiences and Academic Perspectives on Cultivating Healthy Emotional Responses to the Climate Crisis [University of Colorado at Boulder]. https://digitalcollections.sit.edu/isp_collection/2642/
45. Koch, S. C. (2017). Arts and health: Active factors and a theory framework of embodied aesthetics. *The Arts in Psychotherapy*, 54, 85–91. <https://doi.org/10.1016/j.aip.2017.02.002>
46. Kopytin Alexander. (2021). Ecological/nature-assisted arts therapies. <https://doi.org/10.24412/2713-184X-2021-2-6-18>
47. Krosnick, J. A. (1991). Response strategies for coping with the cognitive demands of attitude measures in surveys. *Applied Cognitive Psychology*, 5(3), 213–236. <https://doi.org/10.1002/acp.2350050305>
48. Lawrance, E. L., Thompson, R., Newberry Le Vay, J., Page, L., & Jennings, N. (2022). The Impact of Climate Change on Mental Health and Emotional Wellbeing: A Narrative Review of Current Evidence, and its Implications. *International Review of Psychiatry*, 34(5), 443–498. <https://doi.org/10.1080/09540261.2022.2128725>
49. Lee, J., Park, J., & Choi, S. (2020). Environmental influence in the forested area toward human health: Incorporating the ecological environment into art psychotherapy. *Journal of Mountain Science*, 17(4), 992–1000. <https://doi.org/10.1007/s11629-019-5774-3>
50. Levin, K., Cashore, B., Bernstein, S., & Auld, G. (2012). Overcoming the tragedy of super wicked problems: Constraining our future selves to ameliorate global climate change. *Policy Sciences*, 45(2), 123–152. <https://doi.org/10.1007/s11077-012-9151-0>
51. Lindhe, N., Bengtsson, A., Byggeth, E., Engström, J., Lundin, M., Ludvigsson, M., Aminoff, V., Berg, M., & Andersson, G. (2023). Tailored internet-delivered cognitive behavioral therapy for individuals experiencing psychological distress associated with climate change: A pilot randomized controlled trial. *Behaviour Research and Therapy*, 171, 104438. <https://doi.org/10.1016/j.brat.2023.104438>
52. Liu, J., Hull, V., Batistella, M., DeFries, R., Dietz, T., Fu, F., Hertel, T. W., Izaurralde, R. C., Lambin, E. F., Li, S., Martinelli, L. A., McConnell, W. J., Moran, E. F., Naylor, R., Ouyang, Z., Polenske, K. R., Reenberg, A., De Miranda Rocha, G., Simmons, C. S., ... Zhu, C. (2013). Framing Sustainability in a Telecoupled World. *Ecology and Society*, 18(2), art26. <https://doi.org/10.5751/ES-05873-180226>
53. Ma, T., Moore, J., & Cleary, A. (2022). Climate change impacts on the mental health and wellbeing of young people: A scoping review of risk and protective factors. *Social Science & Medicine*, 301, 114888. <https://doi.org/10.1016/j.socscimed.2022.114888>
54. Manning, C., & Clayton, S. (2018). Threats to mental health and wellbeing associated with climate change. In *Psychology and Climate Change* (pp. 217–244). Elsevier. <https://doi.org/10.1016/B978-0-12-813130-5.00009-6>
55. Marselle, M. R., Hartig, T., Cox, D. T. C., De Bell, S., Knapp, S., Lindley, S., Triguero-Mas, M., Böhning-Gaese, K., Braubach, M., Cook, P. A., De Vries, S., Heintz-Buschart, A., Hofmann, M., Irvine, K. N., Kabisch, N., Kolek, F., Kraemer, R., Markevych, I., Martens, D., ... Bonn, A. (2021). Pathways linking biodiversity to human health: A conceptual framework. *Environment International*, 150, 106420. <https://doi.org/10.1016/j.envint.2021.106420>
56. Maujean, A., Pepping, C. A., & Kendall, E. (2014). A Systematic Review of Randomized Controlled Studies of Art Therapy. *Art Therapy*, 31(1), 37–44. <https://doi.org/10.1080/07421656.2014.873696>
57. Mehrabian, A. (1996). Pleasure-arousal-dominance: A general framework for describing and measuring individual differences in Temperament. *Current Psychology*, 14(4), 261–292. <https://doi.org/10.1007/BF02686918>
58. Merriam-Webster. (n.d.). Therapeutic Definition & Meaning. <https://www.merriam-webster.com/dictionary/therapeutic>
59. Moore, M. M., & Yang, J. Z. (2020). Using Eco-Guilt to Motivate Environmental Behavior Change. *Environmental Communication*, 14(4), 522–536. <https://doi.org/10.1080/17524032.2019.1692889>
60. Morgan, D. (1997). *Focus Groups as Qualitative Research*. SAGE Publications, Inc. <https://doi.org/10.4135/9781412984287>
61. Morin, A. (2023). Healthy Coping Skills for Uncomfortable Emotions. *Verywell Mind*. <https://www.verywellmind.com/forty-healthy-coping-skills-4586742>
62. Morton, T. (2013). *Hyperobjects: Philosophy and ecology after the end of the world*. University of Minnesota press.
63. Moula, Z., Palmer, K., & Walshe, N. (2022). A Systematic Review of Arts-Based Interventions Delivered to Children and Young People in Nature or Outdoor Spaces: Impact on Nature Connectedness, Health and Wellbeing. *Frontiers in Psychology*, 13, 858781. <https://doi.org/10.3389/fpsyg.2022.858781>

64. Narawad, A. (2023). Global surveys show people's growing concern about climate change. *Clean Energy Wire*. <https://www.cleanenergywire.org/factsheets/global-surveys-show-peoples-growing-concern-about-climate-change#three>
65. Network for Environmental Professionals. (n.d.). Over VVM. <https://www.vvm.info/over-vvm>
66. Nielsen, E. (n.d.). Conversation starters. *Talk Climate Change*. <https://talkclimatechange.org/starters>
67. Norgaard, K. M. (2006). "We Don't Really Want to Know": Environmental Justice and Socially Organized Denial of Global Warming in Norway. *Organization & Environment*, 19(3), 347–370. <https://doi.org/10.1177/1086026606292571>
68. Ogunbode, C. A., Doran, R., Hanss, D., Ojala, M., Salmela-Aro, K., Van Den Broek, K. L., Bhullar, N., Aquino, S. D., Marot, T., Schermer, J. A., Wlodarczyk, A., Lu, S., Jiang, F., Maran, D. A., Yadav, R., Ardi, R., Chegeni, R., Ghanbarian, E., Zand, S., ... Karasu, M. (2022). Climate anxiety, wellbeing and pro-environmental action: Correlates of negative emotional responses to climate change in 32 countries. *Journal of Environmental Psychology*, 84, 101887. <https://doi.org/10.1016/j.jenvp.2022.101887>
69. Ojala, M. (2016). Canadian Journal of Environmental Education. *Canadian Journal of Environmental Education*, 21, 41–56. https://www.researchgate.net/publication/317647870_Facing_Anxiety_in_Climate_Change_Education_From_Therapeutic_Practice_to_Hopeful_Transgressive_Learning
70. O'Mahony, T. (2022). Toward Sustainable Wellbeing: Advances in Contemporary Concepts. *Frontiers in Sustainability*, 3, 807984. <https://doi.org/10.3389/frsus.2022.807984>
71. Paulus, P. B., Kenworthy, J. B., & Marusich, L. R. (2021). Alone Versus Together: Finding the Right Balance for Creativity. In R. J. Coplan, J. C. Bowker, & L. J. Nelson (Eds.), *The Handbook of Solitude* (1st ed., pp. 268–279). Wiley. <https://doi.org/10.1002/9781119576457.ch19>
72. Pienaar, M. (2011). An Eco-Existential Understanding of Time and Psychological Defenses: Threats to the Environment and Implications for Psychotherapy. *Ecopsychology*, 3(1), 25–39. <https://doi.org/10.1089/eco.2010.0058>
73. Pihkala, P. (2018). ECO-ANXIETY, TRAGEDY, AND HOPE: PSYCHOLOGICAL AND SPIRITUAL DIMENSIONS OF CLIMATE CHANGE: with Karl E. Peters, "Living with the Wicked Problem of Climate Change"; Paul H. Carr, "What Is Climate Change Doing to Us and for Us?"; James Clement van Pelt, "Climate Change in Context: Stress, Shock, and the Crucible of Livingkind"; Robert S. Pickart, "Climate Change at High Latitudes: An Illuminating Example"; Emily E. Austin, "Soil Carbon Transformations"; David A. Larrabee, "Climate Change and Conflicting Future Visions"; Panu Pihkala, "Eco-Anxiety, Tragedy, and Hope: Psychological and Spiritual Dimensions of Climate Change"; Carol Wayne White, "Re-Envisioning Hope: Anthropogenic Climate Change, Learned Ignorance, and Religious Naturalism"; Matthew Fox, "Climate Change, Laudato Si' , Creation Spirituality, and the Nobility of the Scientist's Vocation"; Christopher Volpe, "Art and Climate Change: Contemporary Artists Respond to Global Crisis"; Jim Rubens, "The Wicked Problem of Our Failing Social Compact"; and Peter L. Kelley, "Crossing the Divide: Lessons from Developing Wind Energy in Post-Fact America." *Zygon®*, 53(2), 545–569. <https://doi.org/10.1111/zygo.12407>
74. Pihkala, P. (2020). The Cost of Bearing Witness to the Environmental Crisis: Vicarious Traumatization and Dealing with Secondary Traumatic Stress among Environmental Researchers. *Social Epistemology*, 34(1), 86–100. <https://doi.org/10.1080/02691728.2019.1681560>
75. Pihkala, P. (2022). Toward a Taxonomy of Climate Emotions. *Frontiers in Climate*, 3, 738154. <https://doi.org/10.3389/fclim.2021.738154>
76. Pike, A. A. (2021). *Eco-art therapy in practice*. Routledge.
77. Plutchik, R. (Ed.). (1984). *Emotion: Theory, research, and experience*. Vol. 1: Theories of emotion (2. Druck, Vol. 1). Acad. Press.
78. Potash, J. S., Bardot, H., Moon, C. H., Napoli, M., Lyonsmith, A., & Hamilton, M. (2017). Ethical implications of cross-cultural international art therapy. *The Arts in Psychotherapy*, 56, 74–82. <https://doi.org/10.1016/j.aip.2017.08.005>
79. Psynd. (n.d.). Welke registraties hebben behandelers? <https://www.psynd.nl/welke-registraties-hebben-een-psycholoog-therapeut-of-psychotherapeut/>
80. Regev, D., & Cohen-Yatziv, L. (2018). Effectiveness of Art Therapy With Adult Clients in 2018—What Progress Has Been Made? *Frontiers in Psychology*, 9, 1531. <https://doi.org/10.3389/fpsyg.2018.01531>
81. Renouf, J. S. (2021). Making sense of climate change—The lived experience of experts. *Climatic Change*, 164(1–2), 14. <https://doi.org/10.1007/s10584-021-02986-5>
82. Richardson, J. H. (2018). When the End of Human Civilization Is Your Day Job. *Esquire*. <https://www.esquire.com/news-politics/a36228/ballad-of-the-sad-climatologists-0815/>
83. Rubin, H. J., & Rubin, I. (2012). *Qualitative interviewing: The art of hearing data* (Third edition). Sage.

84. Saraceno, J. (2017). CBT Eco-Art Therapy: Mood Regulation with Young Adults in Nature [Notre Dame de Namur University]. <https://www.proquest.com/openview/43d633a80232d5a51d3003746ece5353/1?pq-origsite=gscholar&cbl=18750>
85. Saulsman, L., & Nathan, P. (2012). Facing Your Feelings: Learning to Tolerate Distress. Centre for Clinical Interventions. <https://www.cci.health.wa.gov.au/-/media/CCI/Consumer-Modules/Facing-Your-Feelings/Facing-Your-Feelings—01—Understanding-Distress-Intolerance.pdf>
86. Schwarz, N. (1999). Self-reports: How the questions shape the answers. *American Psychologist*, 54(2), 93–105. <https://doi.org/10.1037/0003-066X.54.2.93>
87. Slayton, S. C., D'Archer, J., & Kaplan, F. (2010). Outcome Studies on the Efficacy of Art Therapy: A Review of Findings. *Art Therapy*, 27(3), 108–118. <https://doi.org/10.1080/07421656.2010.10129660>
88. Speert, E. (2016). Eco-Art Therapy: Deepening Connections with the Natural World. American Art Therapy Organization. <https://arttherapy.org/eco-art-therapy-deepening-connections-natural-world/>
89. Summers, J. K., & Vivian, D. N. (2018). Ecotherapy – A Forgotten Ecosystem Service: A Review. *Frontiers in Psychology*, 9, 1389. <https://doi.org/10.3389/fpsyg.2018.01389>
90. Sunassee, A., Bokhoree, C., & Patrizio, A. (2021). Students' Empathy for the Environment through Eco-Art Place-Based Education: A Review. *Ecologies*, 2(2), 214–247. <https://doi.org/10.3390/ecologies2020013>
91. Teachers College Columbia University. (n.d.). Understanding Potential Risks for Human Subjects Research. <https://www.tc.columbia.edu/institutional-review-board/how-to-submit/guides-resources/understanding-potential-risks-for-human-subjects-research/>
92. Van De Vijver, F., & Tanzer, N. K. (2004). Bias and equivalence in cross-cultural assessment: An overview. *European Review of Applied Psychology*, 54(2), 119–135. <https://doi.org/10.1016/j.erap.2003.12.004>
93. Van Lith, T. (2016). Art therapy in mental health: A systematic review of approaches and practices. *The Arts in Psychotherapy*, 47, 9–22. <https://doi.org/10.1016/j.aip.2015.09.003>
94. Virgolino, A., Antunes, F., Santos, O., Costa, A., Matos, M. G. D., Bárbara, C., Bicho, M., Caneiras, C., Sabino, R., Núncio, M. S., Matos, O., Santos, R. R., Costa, J., Alarcão, V., Gaspar, T., Ferreira, J., & Carneiro, A. V. (2020). Towards a Global Perspective of Environmental Health: Defining the Research Grounds of an Institute of Environmental Health. *Sustainability*, 12(21), 8963. <https://doi.org/10.3390/su12218963>
95. Voški, A., Wong-Parodi, G., & Ardoin, N. M. (2023). A new planetary affective science framework for eco-emotions: Findings on eco-anger, eco-grief, and eco-anxiety. *Global Environmental Psychology*, 1, e11465. <https://doi.org/10.5964/gep.11465>
96. Vrije Universiteit. (2024). Research Data Management. LibGuides. <https://libguides.vu.nl/rdm>
97. Wallace, R. L., Greenburg, J., & Clark, S. G. (2020). Confronting anxiety and despair in environmental studies and sciences: An analysis and guide for students and faculty. *Journal of Environmental Studies and Sciences*, 10(2), 148–155. <https://doi.org/10.1007/s13412-020-00609-6>
98. Warpechowski, K., Orzeszek, D., & Nielek, R. (2019). Tagging emotions using a wheel user interface. *Proceedings of the 13th Biannual Conference of the Italian SIGCHI Chapter: Designing the next Interaction*, 1–5. <https://doi.org/10.1145/3351995.3352056>
99. Whatley, S. (2013). Plutchik's wheel of emotion [Graphic]. <https://www.simonwhatley.co.uk/writing/plutchik-wheel-of-emotion/>
100. Wobeto, M. I., Brites, R., Hipólito, J., Nunes, O., & Brandão, T. (2022). Emotion regulation and mental health among professionals of long-term care institutions for older adults: The mediating role of work engagement. *Health Psychology Report*. <https://doi.org/10.5114/hpr/156259>
101. Wright, C., & Nyberg, D. (2012). Working with passion: Emotionology, corporate environmentalism and climate change. *Human Relations*, 65(12), 1561–1587. <https://doi.org/10.1177/0018726712457698>
102. Zembylas, M. (2008). Adult learners' emotions in online learning. *Distance Education*, 29(1), 71–87. <https://doi.org/10.1080/01587910802004852>